BEFORE COMMISSIONERS APPOINTED
BY THE WAIKATO REGIONAL COUNCIL

IN THE MATTER	of the Resource Management Act 1991
AND	
IN THE MATTER	of the First Schedule to the Act
AND	
IN THE MATTER	of Waikato Regional Plan Change 1- Waikato and Waipā River Catchments and Variation 1 to Plan Change 1
AND	
IN THE MATTER	of submissions under clause 6 First Schedule
BY	**BEEF + LAMB NEW ZEALAND LIMITED** **Submitter**

BRIEF OF EVIDENCE OF CORINA JODI JORDAN

9 May 2019

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QUALIFICATIONS AND EXPERIENCE

1. My full name is Corina Jodi Jordan.

2. I gave evidence for Beef + Lamb New Zealand Ltd (B+LNZ) as part of its case on the hearing stream 1 (HS1) topics. In my HS1 evidence, dated 15 February 2019, I set out my qualifications, current employment and employment history and professional affiliations. I confirm those details remain current.

3. My evidence for Hearing 1 summarised the planning approach proposed by Waikato Regional Council and also set out the background to the relevant regionally significant natural resource management issues, the statutory requirements and an evaluation of the relevant planning instruments. This remains pertinent to my evidence for Hearing 2 and I will not repeat here.

4. This brief of evidence provides a planning assessment which specifically focuses on the matters in the Waikato Regional Council's proposed Plan Change 1 and Variation 1 (PC1) that relate to farming, and on which Beef + Lamb New Zealand submitted. It assesses the topics the Hearing Panel has directed be considered in hearing stream 2 and that have been addressed in the s42A report.

5. This evidence is organised as follows:

    (a) Changes to the red meat sector overtime, relative environmental risks, and policy frameworks;

    (b) Flexibility in land use patterns and emissions

    (c) Management and allocation options

        (i) Analysis of PC1 Method – Grandparenting;

        (ii) Analysis of alternative allocation methods, including natural capital-based allocation and equal allocation; and

        (iii) Risks and uncertainties associated with modelling underpinning PC1 and implications for effective implementation of the

provisions.

(d) Stock exclusion;

(e) Farm Environment Plans and Good Farming Practice;

(f) Specific provisions around New Policy 1A, Community responsibility to contribute to reductions of contaminant loads; and Schedule B

6. In preparing this evidence I have reviewed the plan change, supporting reports and statements of evidence of other experts relevant to my area of expertise, and relevant background documents and technical reports, including:

(a) Waikato Regional Councils proposed Plan Change 1 and Variation 1;

(b) Waikato Regional Councils s32 report;

(c) Waikato Regional Councils s42A report;

(d) Vision and Strategy for the Waikato River;

(e) Waikato Freshwater Strategy;

(f) B+LNZ submission on PC1 and Variation 1;

(g) Expert evidence of Mr Andrew Burtt HS1;

(h) Expert evidence of Dr Hannah Mueller HS1;

(i) Expert evidence of Dr Christopher Dada HS1;

(j) Expert evidence of Dr Tim Cox HS1 and HS2;

(k) Expert evidence of Dr Jane Chrystal HS1 and HS2;

(l) Expert evidence of Mr Richard Parkes HS1 and HS2;

(m) Expert evidence of Mr Gerry Kessels HS1.

(n) Expert evidence of Dr Alec MacKay HS2; and

(o) Expert evidence of Dr Alison Dewes HS2.

7. I reconfirm that I have read the Code of Conduct for Expert Witnesses in the Environment Court's 2014 Practice Note and agree to comply with it. I confirm that the opinions I have expressed represent my true and complete professional opinions. The matters addressed by my evidence are within my field of professional expertise. I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed.

EXECUTIVE SUMMARY

8. In my view, PC1 fails to acknowledge the significant eco-efficiency gains made by the sheep and beef sector in the last 20-30 years and progress towards internalising its externalities. PC1 does this by restricting land use change, nitrogen discharges, and stocking rates, irrespective of the relative cause or contribution of land uses on Freshwater Objectives. When considering regulatory responses, it is important to look at the characteristics of the activities that are to be regulated. In my opinion the approach adopted in PC1 is inefficient and likely to be ineffective, when considering it against the requirements of s32.

9. For the policies and rules relating to farming to be effective, they need to cause an improvement in water quality in water bodies that are currently over-allocated. They also need to ensure that catchments that are close to exceeding water quality limits do not degrade to the point where the limits are exceeded. In my view, the provisions proposed by the Council do not achieve this.

10. In considering the evidence of B+LNZ, it is my view that there is a robust planning argument to support a plan regime that manages farming activities in a more specific way in order to address existing over-allocation and prevent further over-allocation. That approach is based around setting nutrient discharge standards for farming activities to provide certainty to resource users and to retain a strong linkage between the regulatory approach and the objectives of the Plan.

11. As such I propose significant amendments to PC1 to provide for the following key areas:

(a) Stronger focus on subcatchment planning frameworks and incorporation of load limits and targets within Table 3.11-1;

(b) Flexibility in land use and nitrogen emissions for low intensity farming systems;

(c) Incorporation of natural capital allocation through Land Use Capability (LUC) based Nitrogen Leaching standards and Stocking rates;

(d) Tailored and risked based approach to farm environment planning underpinned by robust analyses of the underlying natural capital of the land through LUC analysis and identification of critical source areas;

(e) Medium intensity farming rule underpinned by FEP and Fonterra's Nitrogen Risk Scorecard;

(f) Capping high emitting land uses through RD rules and setting a trajectory of reductions in diffuse discharges overtime.

12. The approach I propose more appropriately and effectively gives effect to the Vison and Strategy in that it defines a clear trajectory of land use practice, and where required change, in order to protect and restore the health and wellbeing of the Waikato River, while providing for the health and wellbeing of its communities. Importantly the approach adopts an integrated and holistic framework for managing both land and water resources that are intimately linked and spatially explicit.

B+LNZ SUBMISSION

13. I summarised B+LNZ submission on PC1 in my evidence for Hearing 1.[1] That summary remains relevant to this hearing. The chief areas of concern related to PC1 which were set out in B+LNZ's original submission and which are the subject of this hearing stream are summarised in (a) to (f) below:

[1] Corina Jordan, Evidence in Chief Hearing 1, paragraphs 32-35.

(a) The lack of clarity for individuals and communities on how the 80-year water quality outcomes will be achieved;

(b) PC1's 'grandparenting' allocation approach, which requires farms to provide and then not exceed a modelled N leaching value, referred to as a nitrogen reference point (NRP), based on their 2014/15 or 2015/16 farming systems;

(c) The lack of flexibility in the PC1 framework provided to the sheep and beef sector and which is necessary for this sector to be resilient into the future. This includes the failure to recognise the significant gains that the sector has made in relation to the sustainable and integrated management of land and water resources;

(d) The provisions regarding stock exclusion from waterbodies through permanent fencing in particular for hill country farms;

(e) The content and structure of farm environment plans (FEP); and

(f) The blanket application of the regulatory instruments. B+LNZ considers this approach fails to recognise local conditions and communities. B+LNZ seek a tailored sub catchment approach, which B+LNZ consider is more efficient and effective approach than the PC1 approach as notified.

14. My understanding of B+LNZ's submission is that the organisation supports giving effect to the Vision and Strategy through PC1, and the establishment of actions to manage water quality, and in particular the identification of environmental risk tied with appropriate actions to avoid, remedy, or mitigate this risk. B+LNZ, however, has expressed concerns that the provisions, including rules and activity standards, are overly prescriptive and may not be sufficiently linked to an effect on water quality or ecosystem health and processes.

15. Furthermore, B+LNZ is concerned with the linkages, or in its opinion, lack of linkages, between the values, freshwater objectives, and the numerical reflection of these through Table 3-11.1. B+LNZ has submitted in opposition to a number of PC1 Table 3-11.1 numerical objectives including E. Coli,

clarity, and nitrogen, seeking amendments to these which they submit are more closely aligned to the values that the objectives provide for.

16. In this evidence, my focus will be on the structure and cohesion of the policies and rules, allocation methods, stock exclusion, FEPs, and sub catchment approach, and the overall effectiveness and efficiency of the planning framework. The sub catchment approach is also to be developed further through Hearing Stream 3.

OUTLINE OF APPROACH UNDERPINNING FARMING PROVISIONS

17. My HS1 evidence and that of the other B+LNZ witnesses sets out the overall water management framework within which the farming provisions have been evaluated and developed. I will not repeat that evidence here, other than to briefly summarise that approach.

    (a) The values and freshwater objectives are defined.

    (b) Limits or targets are set that provide for those objectives to be met. Limits are set at a level that ensures that the life-supporting capacity and the availability of resource for future generations are protected as a bottom line.

    (c) Methods including rules are developed which, when implemented, work together to ensure that all resource use affecting the achievement of the Freshwater Objectives is managed so that where limits are currently met the limits are not breached, and where the targets are currently breached there is a progressive improvement over time to a point where the targets are no longer exceeded.

18. The framework for the farming provisions I have proposed builds on the broader framework set out above.

CHANGES TO THE RED MEAT SECTOR OVERTIME, RELATIVE ENVIRONMENTAL RISK, & POLICY FRAMEWORKS

19. The RMA establishes the principal that the use and development of our natural and physical resources be managed so as to provide [inter alia] for

the social, economic and cultural wellbeing of people and communities while avoiding, remedying or mitigating any adverse effects on the environment.[2]

20. The NPSFM provides specific guidance on how this is to be achieved in respect of the sustainable management of freshwater resources and provides for locally specific responses to freshwater management to be devised and implemented (Objective CA1, Policy CA1 and CA2). The NPSFM is clear that the process of implementing the NSPFM begins with defining FMUs (Policy CA1(b)) followed by defining the values for each FMU (CA1(c)). The procedures established under the NSPFM, such as setting enforceable quality and quantity limits to achieve the values, is "a fundamental step to achieving environmental outcomes and creating the necessary incentives to use fresh water efficiently, while providing certainty for investment" (emphasis added).[3] The development and implementation of regulatory and non-regulatory methods to assist in the management and improvement of water quality in FMUs is established in the NSPFM (Policies A2, B4 and B6) and the RMA generally (e.g. s67(1)(c)).

21. Section 32 of the RMA establishes the evaluative tools to enable policy developers and communities to test proposed objectives and methods against the purpose of the RMA and related statutory documents, and determine if the anticipated benefits of a proposed approach to give effect to the RMA, the NPSFM and regional statutory direction outweigh the anticipated costs and risks.

22. This overarching statutory framework allows for the development of specific, locally applicable resource management frameworks where the level of regulatory intervention to manage activities is commensurate with the level of environmental risk the activity poses, in this case to the achievement of freshwater quality. For example, if an activity is low risk and risk of intensification of that activity is not present then it is efficient for the

[2] RMA, section 5.

[3] NPSFM, preamble, page 5.

regulatory intervention to be light and increased focus on non-regulatory methods may be appropriate.

23. From a planning perspective, therefore, management frameworks should be effects based, efficient and effective in achieving the objectives of PC1 and other relevant statutory documents, such as the Vison and Strategy and the NPSFM. The framework may comprise both regulatory and non regulatory methods, with the level of regulatory oversight commensurate with the level of environmental risk.

24. The risks from agricultural land uses occur where it is intensified, without sound mitigations, and on vulnerable landscapes. The evidence is that the environmental risk associated with the red meat sector has been declining overtime. The reductions to stocking rate, use of fertiliser, and area farmed, and changes to other land uses have been addressed through the expert evidence of Mr Burtt, Dr Chrystal, Dr Cox, Mr Beetham, and Dr Dewes.

25. Nitrogen leach for the region is driven by a range of factors – mainly rainfall, soils, stocking rate and management styles (N use per hectare, cropping, and irrigation).[4] High stocking rates, combined with high rates of N use and winter cropping to supplement in the winter, with or without irrigation, can lead to high rates of spill over of pathogens, sediment, nitrogen and phosphorus.[5]

26. In his evidence for HS1, Mr Burtt summarised the key changes in the sheep, beef and dairy sector between 1990 and 2018:

    (a) Dairy now dominates the region;

    (b) The number of **sheep decreased** – by 60 percent between 1990-91 and 2017-18;

[4] Dr Alison Dewes, Evidence in Chief Hearing 2, paragraph 51.

[5] Dr Alison Dewes, Evidence in Chief Hearing 2, paragraph 52.

(c) The number of **beef cattle decreased** – by 25 percent; while

(d) The number of **dairy cows increased** – by over 20 percent.[6]

27. Dr Chrystal's evidence is that N losses below the root zone from farms increases as stocking rate increases. The evidence is that the average stocking rate for sheep and beef farms in Waikato has declined between 1990-91 and 2016-17.[7] Dr Jane Chrystal's evidence, based on data collated from 38 case study farms, gives an average nitrogen leaching loss of 17kg N/ha/yr. Extensive sheep and beef farms, with an average of 15 SU/effective ha/yr, already have low inputs including low fertiliser use, lower stocking rates as they are farming to their grass curve or below it, and generally are net exporters of feed.[8]

28. The effect of this reduction in stocking rate is a decrease of the sheep and beef sector's contribution to nutrient loads. As demonstrated by Dr Chrystal, the stocking rate on dairy farms in the Waikato is significantly higher than that of sheep and beef farms.[9] Dr Chrystal's evidence for this hearing also indicates that sheep and beef nitrogen leaching losses, as shown by Overseer predicted results for four farms that have been surveyed since 1993-94, show no trend of increasing N leaching loss. Furthermore, the stocking rate and N fertiliser applications of these four farms also show no increasing trend.[10] The evidence is also that baseline leaching losses for sheep and beef farms are below N leaching losses of the most extreme dairy scenario.[11]

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[6] Mr Andrew Burtt, Evidence in Chief Hearing 1, Footnote (date of evidence HS1) (paras 16 – 20 and 36 to 46 and figure 13

[7] Mr Andrew Burtt, Evidence in Chief Hearing 1, paragraph 12.

[8] Dr Jane Chrystal, Evidence in Chief Hearing 1, paragraph 144, and 207.

[9] Dr Jane Chrystal, Evidence in Chief Hearing 1, paragraph 198.

[10] Dr Jane Chrystal, Evidence in Chief Hearing 2, paragraphs 15 and 16.

[11] Dr Jane Chrystal, Evidence in Chief Hearing 1, paragraph 203.

29. The changes in instream loads of nitrogen from dairy and sheep and beef are summarised in Table 2 of Dr Dewes' evidence. This shows that the relative contribution of sheep and beef to the N load has decreased from 47.3% in 1972 to 27.3% 2016, while dairy has increased from 52.7% to 72.2% in the same period.[12]

30. The regional changes in the sectors are also represented at the national level. The Environment Aotearoa Report (2019) concludes that modelling also shows that dairy cattle make a proportionally higher contribution to N leached from agricultural soils, compared with other types of livestock. In 2017, dairy cattle contributed 65% of the modelled nitrate-nitrogen, up from 39% in 1990.[13] Dr Dewes also presents evidence detailing the increase in scale and environmental footprint, including the N leaching, of the dairy industry in New Zealand in the last 20-30 years.[14]

31. Agribase data shows that since 2006, dairy farms increased total farm area by 88,000 hectares (26%), while there was a corresponding 2% decline in dry-stock area and 5% decline in other areas (largely forestry). Total dairy stock units increased 15% from 6.36M to 7.32M while dry-stock stock units were unchanged at 2.78M.

32. In summary the average N discharge from the red meat sector is 17gkN/ha/yr, while those for dairy are closer to 50kgN/ha/yr and with an upper range of around 120kgN/ha/yr for intensive irrigated systems.[15]

33. Dr Dewes has also found that irrigated farms in the Waikato on pumice soils exhibit similar leaching levels to Canterbury, of 80-120 kg N leach per ha per year (version 6.3.1).[16]

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[12] Dr Alison Dewes, Evidence in Chief Hearing 2, Table 2, page 22.

[13] Environment Aotearoa 2019, p.58.

[14] Dr Alison Dewes, Evidence in Chief Hearing 2, paragraphs XX – XX.

[15] Dr Alison Dewes, Evidence in Chief Hearing 2, paragraph 41.

[16] Dr Alison Dewes, Evidence in Chief Hearing 2, paragraph 41.

34. Over the corresponding period 1990 to 2018 nutrient impairment of the Waikato and Waipa Rivers has, in the case of nitrogen, worsened over the past two decades,[17] and this problem has been exacerbated in recent decades by the intensification of pastoral dairy farming, which is associated with higher stocking rates and greater feed and fertiliser inputs compared to dry stock.[18]

35. In my view, PC1 fails to acknowledge the significant eco-efficiency gains made by the sheep and beef sector in the last 20-30 years and progress towards internalising its externalities. PC1 does this by restricting land use change, nitrogen discharges, and stocking rates. When considering regulatory responses, it is important to look at the characteristics of the activities that are to be regulated. In my opinion it is impossible to properly assess a plan under s32 without recognising these characteristics.

36. Here, PC1 does not acknowledge the changes and contribution of the sheep and beef sector to the water quality issues that it is trying to manage. In addition, Mr Parkes in HS1 evidence has demonstrated that it has very few choices when examining mitigation options to further reduce nitrogen discharges,[19] and for which "maintaining flexibility to be able to continue adapting as the world changes" is critical to its future.[20]

37. The PC1 regulatory framework locks in existing land use patterns and emissions, effectively rewarding the highest emitters and locking low emitters into a low-emissions framework that does not take into account the environmental carrying capacity of the land the activities are taking place on. As discussed in below, this is an inefficient approach. The costs to the sheep and beef sector are considerable and there is little certainty that the these will be outweighed by the benefits. There is also little certainty that

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[17] Dr Tim Cox, Evidence in Chief Hearing 1, paragraph 28.

[18] Dr Tim Cox, Evidence in Chief Hearing 1, paragraph 31-32.

[19] Mr Richard Parkes, Evidence in Chief Hearing 1, paragraph 52.

[20] Mr Andrew Burtt, Evidence in Chief Hearing 1, paragraph 104.

the PC1 framework as notified will be effective in achieving the PC1 objectives in both the short and long-term.

38. The s42A officers propose some amendments to PC1 to improve the regulatory cascade, such that it more closely aligns with a risk based framework. I support in part the changes to the regulatory regime proposed by the Officers that seek to improve consenting thresholds, and the level of discretion better related to environmental effects. However, the recommended changes continue to impose a high regulatory burden on low impact land uses, such as sheep and beef farming, and where risk of intensification can be effectively managed or is not foreseeable. The rules framework is, and continues to be, in my view, inefficient and unnecessary in respect of the sheep and beef sector. In response, I propose an alternative methods framework providing for regulatory intervention of primary production activities commensurate with the environmental risk they pose. It takes a risk-based approach to the management of primary production activities and, in summary, is comprised of the following components as set out in Appendix 1:

    (a) Permitted activity rule for low intensity land uses, and for land use change, subject to stocking limits or nitrogen discharges commensurate with defined Land Use Capability (LUC) classes;

    (b) Controlled activity rule for medium intensity land uses, perhaps up to 60th percentile nitrogen leaching values for the FMU[21], and which adopts the nitrogen risk scorecard approach proposed by Fonterra;

    (c) Restricted discretionary rules for farming activities that present a greater risk of diffuse contaminate losses contributing to loads in the Rivers that will breach limits or fail to assist meeting targets in Table 3.11-1 and where the standards for the permitted or controlled activity rules are not met; and

    (d) Default discretionary rule for activities not provided for in (a) to (c)

[21] I address my view about the appropriate percentile below.

above.

39. The methods are supported by a comprehensive policy framework that links the management of farming to Freshwater Objectives (Table 3.11-1), through in part, N leaching limits and targets and stocking rate limits and targets based on Land Use Capability (LUC).

40. In my opinion the approach set out above is consistent with giving effect to the RMA and the NPSFM effectively and efficiently. It is consistent with ensuring the soil resource is available for a foreseeable range of uses (Objective 3.25, Waikato RPS), that soil versatility is retained (Waikato RPS, Policy 14.1(c)) and enables Policy 4.4(e) of the Waikato RPS to be fairly and efficiently implemented:

The management of natural and physical resources provides for the continued operation and development of […] primary production activities by:

e) Maintaining and where appropriate enhancing access to natural and physical resources, while balancing the competing demand for these resources.

41. The approach more appropriately and effectively gives effect to the Vison and Strategy in that it defines a clear trajectory of land use practice, and where required change, in order to protect and restore the health and wellbeing of the Waikato River, while providing for the health and wellbeing of its communities. Importantly the approach adopts an integrated and holistic framework for managing both land and water resources that are intimately linked and spatially explicit.

LOCKING IN EXISTING LAND USE PATTERNS AND EMMISIONS

42. In my view, PC1 as notified grandparents existing land uses and discharges through application of the NRP, restricts land use change and restricts stocking rates. Generally speaking, B+LNZ's submission sought to remove provisions that essentially act to tie in existing land uses and emissions profiles, and as such which reduce flexibility in land use stifle innovation and adaption in working towards achieving environmental limits.

43. B+LNZ's submission seeks to ensure PC1 is effects based, efficient and effective, the Plan should target activities which exceed the 'sustainable level' and require through consent those activities to progressively reduce contaminant discharges over time. Small scale (<20ha) or low impact activities (those discharging at or below the sustainable level) should be enabled to continue and be provided flexibility to change farm systems and stocking rates up to the sustainable levels for the sub catchment.

44. The changes sought by B+LNZ are reflected in relief sought to number of provisions, as follows:

Provision	Relief Sought by B+LNZ
Policy 1	Amend Policy 1 to ensure low discharging land uses such as small scale (<20kg N/ha) or low impact activities (those discharging at or below the sustainable level) are enabled to continue and are provided with flexibility to change farm systems and stocking rates up to the sustainable levels for the sub-catchment (FMU). Sustainable level to be provided through recognition of the natural capital of the land (LUC)
Policy 4	Amend Policy 4 so that it enables small scale land uses (<20ha), low intensity, and low discharging land uses to continue, to be flexible in their land use and their discharge of Nitrogen, and stocking rates, and to be established as set out under Policy 1.
Rule 3.11.5.2	Enable flexibility in land use, discharges, and stocking rates up to standards or thresholds suggested, e.g. 20kgN/ha/yr or alternatively replace 20kg/N/ha/yr with the 'sustainable level' calculated in accordance with policy 1, policy 2 (as recommended to be amended), or adopt a permitted threshold for Nitrogen discharge based on land use capability as a proxy for natural capital; and delete any standards or clauses which hold land uses to historic nutrient discharge levels or stocking rates.
Rule 3.11.5.7	Amend rule 3.11.5.7 so that the rule does not apply to land use change where it does not exceed the sustainable Nitrogen discharge threshold (or limit) for the sub-catchment, or stocking rates.

45. I support these amendments in principle because they seek to provide extensive farming systems, such as sheep and beef farming, forestry, and some horticulture, the flexibility to operate up to or within 'sustainable levels'.

In the B+LNZ submission, sustainable level is defined as either kg liveweight per ha (stocking rate) or nitrogen kg discharge rate per hectare (kgN/ha/yr) relative to land use capability (LUC) and which achieves the desired instream N load Limit or Target.

46. Further detail regarding the concept of sustainable level is provided in the evidence of Dr Mackay and Dr Dewes for this hearing. As indicated above, it has its basis in the land use capability classification. As described by Dr Mackay, a proxy for the natural capital of the landscape can be derived from the LUC classification system, which establishes the underlying capability of soil to retain and supply nutrients and water and the capacity of the soil to provide an environment to sustain legume and grass growth under the pressure of grazing animals.[22]

47. The B+LNZ proposal uses the data from the extended legends of the LUC worksheets detailing stock carrying capacities and fertiliser data for the Waikato Region in the paper by Jessen & Booth (1980), for which a value for each is included in the inventory for each LUC unit.[23] In absence of a direct measure of natural capital, the Top Farmer livestock carrying capacity for each LUC unit in the Waikato Region is broken down into the four freshwater management units that are used as the proxy for natural capital.[24] This approach is supported by Dr Dewes' evidence, which establishes a recommended stocking rate and N leach by FMU that is based on a relevant pasture harvest when it is not reliant on anthropogenic nitrogen, winter cropping, grazing off and supplementary feeds.[25]

48. Dr Mackay explains that the weighted average stock units/ha provide an indication of the productive potential of a legume-based pasture on each of the LUC Classes within each of the four Freshwater Management Zones. For farms operating below the stock unit number there is opportunity to

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[22] Dr Alec Mackay, Evidence in Chief Hearing 2, paragraph 42.

[23] Dr Alec Mackay, Evidence in Chief Hearing 2, paragraph 43.

[24] Dr Alec Mackay, Evidence in Chief Hearing 2, paragraph 59.

[25] Dr Alison Dewes, Evidence in Chief Hearing 2, paragraph 131.

continue to operate and develop, while operations with productions systems beyond a legume-based system would have to over time progressively bring back either production or introduce mitigation to reduce N leaching losses.[26]

49. I consider this to be an efficient and effective approach to establishing a risk threshold for low intensity activities, and a permitted baseline. An LUC-derived threshold is directly related to the productive capacity of land, not existing land uses that may not be maximising the productive potential of the land (for a range of economic, social or cultural reasons) or are operating in such a way that the rate at which the life-supporting capacity of air, water, soil and ecosystems can be safe-guarded (RMA, section 5) is exceeded.

50. An LUC-based risk threshold also enables decision makers to take into account the relative environmental impacts of land use and discharges within the regulatory framework. This is a vital tool, particularly in respect of the implementation of Policy 4.4 of the Waikato RPS, which requires decision makers to 'balance' competing demands from primary production activities for access to natural and physical resources. A natural capital based mechanism enables decision makers to ensure that demands on resources (e.g. land use activities and farming systems) are matched to the natural capital of the land and that those activities take place within environmental limitations necessary to achieve the objectives of PC1 and give effect to the RMA, NPSFM, Vision and Strategy and regional planning documents.

51. A regulatory framework formulated on this basis creates a responsive effects based regime, able to effectively differentiate between low, medium and high risk activities. In relation to low intensity farming systems or those that are farming to the natural capital of their land, a framework can be developed that provides a lighter regulatory response (as compared to high-risk activities) and still contribute to the achievement of PC1's objectives. Such an approach integrates the management of land and water resources, as envisaged by the RMA, the NPSFM (Section C) and the Vision and

[26] Dr Alec Mackay, Evidence in Chief Hearing 2, paragraph 61.

Strategy, and is more effective and efficient approach than that established by PC1.

52. The lack of flexibility inherent in the PC1 approach is illustrated by the current structure of:

(a) Policy 1 as notified (and amended by Officers) and its application of NRP, stocking rates, and restrictions on land use change. Policy 1 enables activities with 'low level contaminant discharges', but does not provide any certainty about what is meant by that term. It does appear, through proposed amendments to Rule 3.11.5.2 (Low Intensity Farming activities) and proposed new Rule 3.11.5.2A, that PC1 correlates the intensity of activities (in terms of their contaminant discharges) with stocking rates. For example, in Rule 3.11.5.2, low intensity farming activities relate to stocking rates, being either:

(i) less than 6 stock units per ha; or

(ii) more than 6 but less than 10 stock units per ha (SU/ha) with a calculated NRP and controls on slope and cropping.

(b) New proposed controlled activity Rule 3.11.5.2A (which manages medium intensity farming) appears to suggest that activities generating moderate contaminant discharges correlate to a stocking rate of the land of no greater than 18 SU/ha, and which holds farming to its NRP;

(c) Non-complying rule as notified for land use change.

53. As proposed by the Officers, Policy 1 requires ‘reductions in diffuse discharges irrespective of the health of freshwater ecosystems and provision of the values identified in PC1. Seeking improvement in land uses and reductions in discharges beyond that required to provide for a healthy Waikato River and its tributaries, as is required by the Vision and Strategy and NPSFM, essentially requires full afforestation of the catchment. Concepts of restoration and protection under the Vision and Strategy are not opened ended, they are instead appropriately bookended by the values including the health and wellbeing of the Waikato River, which I understand

is consistent with Objective A1 ecosystem health requirements of the NPSFM.

54. As set out in my evidence for HS1 it is more efficient and effective to seek that land uses internalise their externalities of concern. These will not be the same for each land use and is dependent on the landscape that it occurs on. As such management frameworks should more correctly ensure that individuals avoid, remedy, or mitigate their effects on the environment, and that the appropriate management unit is both at the farm and the subcatchment scale.

55. The proposed permitted activity Rule 3.11.5.2 stocking rate is less than the weighted average stocking rate for sheep and beef farms of 9.2 SU/ha hectare, or the low risk threshold of 15 SU/ha. Typical sheep and beef farms would therefore be captured by both the proposed and the section 42A officers recommended controlled activity Rule 3.11.5.2A. The officers' s42A recommended controlled rule provides for a stocking rate of the land of no greater than 18 SU/ha.

56. However, both the proposed and recommended rules, grandparent stocking rates and N leaching to those in effect during the reference period in Schedule B. This reference stocking rate may be below the rate that could be supported by the natural capital of the land.[27] Farmers operating efficiently with low N losses will not have the opportunity to take advantage of the productive potential of their soils as they are grandparented to stocking rates below the inherent productive capacity of their land because of the selected dates in PC1.

57. Furthermore, the restrictions in respect of stocking rates do not reflect the realities of farming systems that, as described by Dr Chrystal and Mr Burtt, manage to the pasture growth curve, which is typical of sheep and beef operations. [28] As explained by Dr Chrystal, managing to the pasture growth

[27] Dr Jane Chrystal, Evidence in Chief Hearing 1, paragraph 207.

[28] Dr Jane Chrystal, Evidence in Chief Hearing 1, paragraph 207.

curve means farmers do not specifically alter pasture growth by applying N fertiliser or bringing in large amounts of supplementary feed at times when pasture growth is low.[29] Consequently, total stock numbers carried on an annual basis will depend on the pasture production of the particular season.[30] In my opinion it is imperative that the regulatory framework not impede the ability to alter livestock systems in response to environmental and climatic changes, such as the annual pasture growth curve.

58. It is also not clear how the reference stocking rate is calculated. For example, is it the highest stocking rate that occurred during the reference period, or another measure? Furthermore, stocking rate has not been defined in the plan change, and there is no definition in the operative WRP. If it is intended for stocking rate to be used as a management tool, then there should be certainty as to what it refers to and how it is calculated.

59. I propose that **Stocking Rate** be defined as:

*Stocking Rate is defined as the number of **Stock Units** on a whole of property, Enterprise, or scheme area as expressed in hectares as at 30 June on any given year. **Stocking Rate** shall be expressed as SU/ha.*

60. Policy 4 is proposed to be substantially amended by Officers in response to submissions. However, whilst these amendments may address some of the duplication between Policy 4 and Policy 1 as notified, the corresponding amendments to Policy 1 (and related amendments to Rules 3.11.5.2 and new Rule 3.11.5.2A) do not guarantee the flexibility necessary for farmers to operate effectively and efficiently in the long term; or provide the necessary levels of certainty to the sector regarding their rights and responsibilities in relation to freshwater limits and targets, and the link between their activities and cumulative freshwater outcomes.

61. In response to the issues identified in the provisions analysed above, and the technical evidence presented by Dr Dewes and Dr Mackay, I

[29] Dr Jane Chrystal, Evidence in Chief Hearing 2, paragraph 62.

[30] Dr Jane Chrystal, Evidence in Chief Hearing 2, paragraph 63.

recommend a range of changes to PC1 provisions as set out in full in Appendix 1. These include:

(a) Amendments to Policy 1, 2, 4, 6 and 7;

(b) Introduction of a N leaching and stocking rates limits/targets tables derived using an LUC natural capital based methodology for a permitted activity baseline;

(c) Amendments to Rule 3.11.5.1A, 3.11.5.2, 3.11.5.2A;

(d) Use of Fonterra's N risk scorecard for controlled activities, which applies to farms below the Xth percentile N discharge for the FMU. My preference at this stage is to apply the 60th percentile;

(e) LUC mapping as part of FEP (Schedule 1) and also application of the N risk scorecard through FEP (controlled rule 3.11.5.2A);

(f) Both restricted discretionary rules 3.11.5.3 and 3.11.5.4 for high risk farming are grandparenting with reductions and must not exceed Xth percentile by 2026. As set out above my current preference is 60th percentile.

62. I am mindful that I have not proposed a percentile, but have indicated my preference is the 60th. I support consideration of a lower threshold than the 75th percentile notified and my preference is based on the evidence of Dr Dewes[31]. However, it maybe that a precise value can be identified rather than a statistical measure. I will confirm my position at the hearing or before, but in the meantime confirm that farming that exceeds an upper threshold needs, in my opinion, to be managed differently to activities that do not. This should include stopping any further increases in discharges and reducing

[31] Evidence in Chief Dr Alison Dewes on Behalf of B+LNZ (2019) Hearing Stream 2, para 139, 141 - 145

discharges over time through application of a sinking lid to a defined threshold.

63. Secondly, I note that in my HS1 evidence I was critical of grandparenting in PC1[32]. However, since that time I have had the benefit of seeing the evidence of Dr Mackay. His view is that "the major weaknesses of a grandparenting approach emerge when it forms the basis of a permanent" allocation method.[33] However, in his assessment, when used as an interim measure to capture and set a trajectory of reductions for **intensive land uses and practices** [my own emphasis] ,a grandparenting approach can be an:

"*effective action to immediately stop any further increase in N leaching and any further decline in water quality, assuming no lags. It enables existing land uses to continue with no upfront costs and, as far as practicable, the immediate viability of existing land uses would not be significantly compromised*".[34]

64. The changes proposed in Appendix 1 of this evidence establishes an alternative framework which removes grandparenting for permitted activity and controlled rules, but retains an element of grandparenting for activities that cannot achieve the permitted and controlled activity rules, in that they cannot increase their discharges and must reduce them overtime. Grandparenting is utilised as a transitional tool for intensive farming that still requires reduction over time in this Plan. It does not leave those reductions to future plan changes as proposed by PC1 as notified. The intention is to set a trajectory of improvement that takes into account where people are starting from and improve certainty for the farming sector. Consequently, I consider my proposed alternative framework is consistent with Objective (j) in the Vision and Strategy. It recognises the strategic importance of the Waikato River to social, cultural and economic wellbeing, and establishes a

[32] I address grandparenting further below.

[33] Dr Alec Mackay, Evidence in Chief Hearing 2, paragraph 27.

[34] Dr Alec Mackay, Evidence in Chief Hearing 2, paragraph 27.

clear, certain, fair and equitable framework by which health and wellbeing of the Waikato River can be restored and protected.

65. My proposed approach also reduces the uncertainty that surrounds the potential impacts of the implementation of PC1 as notified, including the uncertainty inherent in the proposed staged approach, as expressed in PC1.

66. My proposed changes also provide for flexibility in land use and discharges through the permitted activity rule which sets targets that achieve the long-term outcomes for instream N concentrations. Flexibility in N discharges is also provided through controlled rule, through the removal of the NRP reference point.

67. In my view, my proposed alternative framework ensures that all landowners are contributing to improving water quality using tools commensurate with the risk, and are fair, equitable, accountable and achievable.

MANAGEMENT OF NITROGEN AND ALLOCATION OPTIONS

68. One of the key issues for this hearing is the method by which primary production activities and associated diffuse discharges from those activities are managed in order to achieve the objectives of PC1, particularly Objective 1.

69. In its original submission, B+LNZ considered that PC1 did not provide or encourage nutrient management or allocation that is based on principles of sustainable management, including providing for future generations, or which incentivise land use and land use change appropriate to soils, climate, and achievement of water quality outcomes. In response to this and other submissions requesting similar relief, the Officers have stated in the s42A report that they '*do not consider that there is adequate information to make wholesale changes to the PC1 N loss framework and that this also applied to the introduction of a land use capability framework or other framework*'.[35]

[35] S42A report, Hearing 2, Paragraph 147.

70. In light of the proposed framework I provide in Appendix 1 of this evidence, I consider there is adequate information available to consider alternatives to PC1. Experts for B+LNZ have provided evidence for an alternative framework, underpinned by modelling, case studies, and regional and national data, that is a more effective and efficient way of achieve the Plan's objectives and the superior documents.

71. I agree with B+LNZ's position that if N is to be allocated to land use then it should be allocated using the most effective and efficient tool available. B+LNZ's submission outlined two alternative approaches to N allocation and requested they be considered – flat rate per hectare or natural capital-based allocation. In my view both alternatives are in line with B+LNZ's 14 principles for the allocation of nutrients[36].

72. The alternatives proposed by B+LNZ also include instream N load limits and Targets, the concept of which I introduced in my evidence in chief for HS1. Currently, N attribute targets are expressed in PC1 as a concentration - mg/L - and have (in conjunction with the P freshwater objective) been set to assist with in river algal biomass. Whilst the measurement of mg/L of N is a reflection of the total amount of N released into the catchment (less attenuation and uptake by plants), it is not a measure of the amount of N lost by a particular piece of land or a particular land use. So, whilst a concentration-based limit is useful for measuring and monitoring whether freshwater objectives are being met, it is not useful for managing the effects of N leachate from land use, nor apportioning responsibility.

73. Dr Cox demonstrated that load limits can be calculated at the freshwater management unit or sub-catchment scale. The maximum catchment load of contaminants is the maximum amount of nutrients that can be discharged from all sources (point and non-point) into a specific catchment while still achieving the objectives of that catchment. In my view amending Table 3.11-1 to include both the allowable instream load and maximum allowable zone load (MAZL) for N for all sub-catchments and FMUs would allow the effects of nitrogen loss from land use to be measured and compared to a desired

[36] See paragraph 36 B+L original submission.

outcome before the effects occur. It provides clear, enforceable limits that enable communities to provide for their economic wellbeing, including their productive economic opportunities, which is a requirement of Objective A4 of the NPSFM.

74. Establishing a regulatory framework that can only react to the exceedance of environmental limits after they have occurred undermines the Council achievement of Objective A4 NPSFM. The catchment load is an effective method to avoid over-allocation, which is the aim of NPSFM Policy A1 and assists with the improvement of water quality (NPSFM Policy A2). Furthermore, the incorporation of catchment load limits provides a platform which facilitates sub-catchment and community management frameworks, which in my opinion is a more effective and efficient way of allocating resources and achieving freshwater objectives. This will be elaborated on through HS3.

75. As introduced in my evidence for HS1, instream N load limits would enable sub-catchment specific approaches to the management of N to be adopted, tailored to the catchment / sub catchment, and communities, and, if appropriate, would enable transfer regimes to be implemented. Without load limits, the only method against which the allocation of N to land use can be measured is by comparison of catchment monitoring results to the concentration limit. This is an inefficient tool for allocating N loss to land use because it does not recognise the value of the management approaches described above[37]. It also begs the question, what happens when monitoring shows the concentration standard is breached? Presumably the Plan must be amended, and resource consents reviewed to reduce the amount of N allocated to land use, which is a reactive, inefficient and ineffective way to achieve PC1's objectives.

76. In response to several submissions seeking additional emphasis on a sub-catchment approach, the s42A officer's make the following observations:

[37] See paragraph 180 Jordan HS1 evidence.

Officers consider that the Vision and Strategy and the new direction in the NPS-FM encourage a catchment wide view. In effect, this means that while sub-catchment level management of the four contaminants is important, equally, if not more important, is the catchment wide view of achieving the water quality outcomes in the whole catchment.[38]

77. The unit at which freshwater resources are directed to be managed in the NPSFM is the FMU (freshwater management unit). As stated in responses to questions from the Panel at Hearing 1, I consider that sub-catchments defined in PC1 to be FMUs. This is because the NPSFM allows an FMU to be at any scale – a water body, multiple water bodies, or any part of a water body. The most important feature of an FMU is that it be at a scale appropriate for setting freshwater objectives and limits and for freshwater accounting purposes.[39] The use of the sub-catchment unit within the freshwater limits table of PC1 indicates that Council have found that scale of unit to be appropriate for setting such limits, and can utilise the monitoring of freshwater attributes at locations within sub-catchments to assist in freshwater accounting. I therefore do not agree with the Officers' observations.

78. The NPSFM requires that freshwater quality within an FMU is maintained at its current level, where community values are currently supported, or improved where they are not.[40] The FMU-scale is therefore at the heart of the process for setting narrative and numerical freshwater objectives, which in turn provide for national and regional values in accordance with the RMA and the NPS-FM:

    (a) For each river reach or FMU identify the appropriate values;

    (b) Establish numerical water quality and quantity freshwater objectives and, where appropriate, limits to provide for those values;

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[38] S42A Officer's Report, paragraph 295.

[39] National Policy Statement for Freshwater Managment (2014, amended 2017), Interpretation.

[40] NPSFM, Preamble, p.5.

(c) Undertake an assessment of current state against desired state (numerical freshwater objectives / limit) and use that to determine the allocation state for the waterbody; and

(d) Establish management approaches to address any over allocation issues and to enhance or provide for the life supporting capacity of the waterbodies concerned.[41]

79. PC1 inconsistently applies the process set out in CA1 of the NPSFM and summarised in (a) to (d) above. For example, the values set out in section 3.11.1 of PC1 are not identified at either FMU scale or sub-catchment scale, but instead is a long list of values that appear to be intended to be applied everywhere irrespective of whether the value applies or is consistent with community aspirations or not. PC1 does not provide directly for catchment-wide outcomes. Instead it identifies eight FMUs as well as sub-catchments for which freshwater objectives have been established for a range of freshwater quality attributes. I also made clear during my questioning at HS1 that I consider the sub-catchments to also be FMU. The achievement of catchment-wide outcomes will necessarily be a sum of the outcomes achieved at the sub-catchment level, not the other way around.

80. The statutory context at the regional level also directs that the spatial unit at which freshwater is managed needs to be that which allows for the most effective management of that freshwater. For example, the integrated catchment management directives in the Waikato RPS acknowledges the need to provide for "variability in catchment management response" (Policy 8.1(a)), and to adopt a 'catchment-based' approach (Method 8.1.1). The explanatory text accompanying Policy 8.1 states:

The management of fresh water bodies is most effectively undertaken at a catchment or sub-catchment level. This approach recognises the inter-connected nature of ground and surface water and land use, and is

[41] Corina Jordan, Evidence in Chief, paragraph

considered a more effective approach of managing the cumulative effects of activities and discharges on fresh water body values.[42]

81. Considering cumulative effects at the whole of catchment scale, as suggested by the s42A reporting officers,[43] is too spatially broad to be helpful to communities wishing to effectively address water quality, and amplifies the uncertainty for landowners and land users inherent in PC1 as notified. As argued in my HS1 evidence, and supported by Mr Parkes evidence, [44] identifying and addressing freshwater quality challenges at the sub-catchment scale can enable and empower communities. It can allow people to understand local and broader spatial scale issues in relation to environmental health and find spatially explicit solutions to achieve freshwater objectives.[45] It establishes the cause and effect link between land use and diffuse discharges. This point of view is supported by Dr Dewes in her evidence for HS2. The best farmers – those operating within the carrying capacity of the landscape – are sensitive to the opportunities and challenges of that land at a granular level (emphasis added):

The best farmers (high performers) I have dealt with are those with a high degree of management skill for animal health and wellbeing, they focus on staff tenure and engagement. <u>These farmers also tend to have a natural sensitivity for the vulnerable landscapes they reside within</u>. The best farmers in my experience are the farmers that farm to the limits of their land, they are not forced (due to debt or other pressures) to push their marginal landscapes into marginal land use systems, (that inherently rely on high inputs that result in high spill over effects on receiving water bodies).[46]

82. An allocation mechanism applied at the sub-catchment scale provides land users with certainty about their rights and responsibilities in relation to an

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[42] Waikato RPS, page 8-3.

[43] S42A Officers' Report, Hearing 2, paragraph 296.

[44] Mr Parkes, Evidence in Chief Hearing 1, paragraph 22.

[45] Corina Jordan, Evidence in Chief Hearing 1, paragraph 123.

[46] Dr Alison Dewes, Evidence in Chief Hearing 2, paragraphs 133-134.

output parameter, and the link between their activities and cumulative freshwater outcomes, which makes the Plan accessible and logical.[47]

83. I propose to achieve this through the changes I am proposing to the policy framework and rules set out in Appendix 1. I propose:

(a) A new Policy 1A which establishes freshwater limits and targets within Table 3.11.1, and recognises that the scale of the FMUs in Table 3.11-1 is at sub-catchment level; and

(b) Policy 1 that require targeted management at the subcatchment level to achieve the limits and targets (as applicable) in Table 3.11-1;

(c) Amendments to Policy 4 to recognise that the activities that are enabled and those that require consent are managed at a sub-catchment level to achieve Table 3.11-1;

(d) That Policy 7 focus on the natural capital of the land (along with a new definition of Natural Capital), which is closely linked to sub-catchment-based approaches when assessing it at a farm-level;

(e) The addition of a LUC Natural Capital Based N Leaching Limits and Stocking Limits tables be included in PC1 to incorporate sub-catchment-based approaches when assessing it at a farm-level;

(f) Amendments to the rules to focus nutrient management and (where necessary) reductions at a farm-level, e.g. LUC mapping as part of FEP and also application of the N risk scorecard through FEP (controlled rule);

PC1 METHOD – GRANDPARENTING APPROACH TO ALLOCATION & NITROGEN MANAGEMENT

[47] Corina Jordan, Evidence in Chief Hearing 1, paragraph 196.

84. Grandparenting has been described as an example of a limit setting approach for tackling diffuse N pollution of freshwater resources that calculates the diffuse N leaching losses based on levels of emissions from current land use or the average of emissions from land use in previous years.[48] I agree with that description.

85. PC1 proposes a grandparenting regime for managing N through the application of the NRP. The NRP is based on historic modelled leaching from the farm. Discharges from the farm cannot exceed these historic levels.[49] In addition, PC1 as notified provides for certain higher discharges (those up to 75th percentile) to continue to discharge at their historic rate.

86. B+LNZ's original submission regarded this approach as effectively rewarding current land uses and practices where nutrient discharges exceed the assimilative capacity of soils and water.[50] This view was widely shared with other submitters who have observed that the proposed approach is "inherently unfair for those landowners with low intensity farming systems or those who have already undertaken considerable steps to reduce N losses".[51] The s42A officers also acknowledged the disadvantages of the PC1 allocation method, broadly agreeing with submitters that with respect to N PC1 "*is costly, inflexible and potentially has a range of unintended consequences.*"[52]

87. The challenges of allocating N based on a grandparented approach have been well traversed in the Courts and summarised in my evidence in chief for Hearing 1.[53] It has been described as an approach that allows:

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[48] Dr Alex Mackay, Evidence in Chief on behalf of the Natural Capital Group, ENV-2017-AKL-334-000003, paragraphs 30-31.

[49] Corina Jordan, EiC Hearing 1, paragraph 25.

[50] B+LNZ original submission, paragraph 19.

[51] S42A report, Hearing 1, paragraph 147.

[52] S42A report, Hearing 1, paragraph 132.

[53] Corina Jordan, EiC Hearing 1, paragraph 198-200.

Existing operators to carry on producing current levels of effects, particularly adverse effects, and imposing restrictions only upon new entrants to whatever activity is being dealt with. It hardly needs be said that it is a concept usually favoured by existing operators, who rationalise it by pointing to the investment they have made in the activity, and claiming it would be unfair to require them to change, (or cease, in extreme cases) the way they do things.[54]

88. The same decision went on to say that in its pure form or as part of a hybrid model, grandparenting is "unattractive" and "administratively inefficient".[55]

89. In his evidence, Dr Mackay also summarises the major weaknesses of a grandparent approach to the allocation of nitrogen:

While in the short-term it allows high N leaching activities to continue, it disadvantages operators actively conserving N and prevents landowners with the potential for growth to realise opportunities into the future. Further it offers no flexibility for low emitters. The lack of flexibility, the in ability to explore other land use options under a grandparenting approach, coupled with the limited ability to mitigate over time to a better match between the inherent capabilities of the underlying resource, all risks and undermining innovation, sustainable use and the future prosperity of communities.[56]

90. In addition to these well-documented challenges associated with a grandparented approach to allocation of N, there are specific implications with the approach taken by PC1 to grandparent to nitrogen discharge benchmarks at 2014/15 or 2015/16 years, and which compound the traditional inequities of the grandparenting model.

91. Dr Chrystal's evidence for HS2 identifies that the pasture growth rate (PGR) in the NRP benchmark years was lower than average overall. Her evidence details the complex management decisions made by sheep and beef

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[54] Day vs Manawatu Regional Council, paragraph 5-128.

[55] Day vs Manawatu Regional Council, paragraph 5-177.

[56] Dr Alec Mackay, Evidence in Chief Hearing 2, paragraph 28.

farmers and more intensive system to mitigate lower-than-average pasture growth rates. These include:

(a) Applying N fertiliser;

(b) Buying in supplementary feed;

(c) Feeding conserved supplementary feed;

(d) Selling livestock;

(e) Buying in fewer livestock to finish;

(f) A combination thereof.[57]

92. Dr Chrystal illustrates that different management decisions have different N leaching effects. For example, in a lower-than-average feed supply scenario, sheep and beef farmers are likely to adopt management decisions (d) or (e) above, most likely result in a lower nitrogen leaching loss than average. However, more intensive farming systems are most likely to employ management decisions (a), (b) and (c) resulting in an increase in the nitrogen leaching loss compared to an average year.[58]

93. A 'potential, unintended consequence' of this aspect of the NRP methodology identified by Dr Chrystal is that "*more intensive systems […] will be given a higher NRP value than they would have in an average year, whereas less intensive farms, that destocked in response to lower than average pasture production are likely to receive a lower NRP value than they would have received in an average year*".[59]

94. The consequences of the proposed NRP benchmark is that the inherent disadvantages of the grandparenting approach to low emitters, as identified

[57] Dr Jane Chrystal, Evidence in Chief Hearing 2, paragraph 68.

[58] Dr Jane Chrystal, Evidence in Chief Hearing 2, paragraph 68-71.

[59] Dr Jane Chrystal, Evidence in Chief Hearing 2, paragraph 72.

by the Courts, are exacerbated, whilst the rewards to high N emitters are amplified.

95. Expert witnesses for B+LNZ have also provided evidence indicating that some of the modelling (for example nutrient and economic modelling) upon which the Council's overall NRP/grandparented approach is founded is flawed. This necessarily calls into question whether the short term or long term environmental and economic outcomes sought by PC1 through a grandparenting allocation approach can be realistically achieved.

96. In the s42A report for HS1, the s42A officers acknowledged the shortcomings with the PC1 grandparented approach and indicated that recommendations would be made to address these issues.[60] However, having considered the s42A report for HS2 and the recommended alternations to PC1's provisions, I conclude that the approach remains one that is firmly 'grandparenting' and retains that approach's inherent inequities, inefficiencies and unsustainability.

97. The use of grandparenting as proposed by PC1 is, in my view, contrary to the Vison and Strategy for the Waikato River, the Waikato Regional Policy Statement and Regional Plan. The Vision and Strategy prioritises the restoration and protection of the Waikato River, but recognises in the vision that the Waikato River has a role in sustaining prosperous communities too. In my view, whilst an allocation framework that rewards high emitters may sustain the prosperity of some farms and farmers in the short term, it undermines the ability of communities to move towards mechanisms and land use practices that achieve *sustainable* prosperity through the efficient use of land in the long term.

98. I also question whether PC1 as proposed, combined with the uncertainty it creates with respect to its staged approach, is inconsistent with the objectives to apply an integrated, holistic and coordinated approach to management of the natural, physical, cultural and historic resources of the Waikato River. I consider a greater sense of coordination and integration

[60] S42A Report Hearing 1, paragraph 132.

could be achieved in PC1 by establishing a framework that explicitly signals transitional arrangements that apply the requirement to reduce emissions fairly and equitably across the community and based on the environment's inherent ability to support activities.

99. The PC1 approach is also contrary to the objectives and policies of the Waikato Regional Policy Statement. Objective 3.2 seeks to maintain and enhance:

- access to natural and physical resources to provide for regionally significant industry and primary production activities that support such industry; and

- the life supporting capacity of soils, water and ecosystems to support primary production activities;

100. The fundamental premise of s5 RMA is that the industries and activities provided for in this objective are conducted on the basis of sustainable management. However, PC1 provides a framework in which unsustainable land use activities and practices are prioritised and provided for, at the expense of activities operating effectively and efficiently within sustainable environmental levels. In this way, the proposed allocation framework unfairly restricts or limits access to natural resources.

101. Under a grandparenting allocation framework, high intensity uses are generally protected. As demonstrated by Dr Dewes and Dr Chrystal, those uses have flexibility, their land values retained and equity is retained. However, extensive farming systems have reduced viability – flexibility to operate and adjust to changes in markets climate and environmental conditions, land value is depreciated, and equity is lost. These are economic impacts that do not reflect the productive potential of the land. The result is the creation of a landscape dominated by a few high emitting land uses offset by large tracts of extensive or unproductive land, for example intensive dairy unit surrounded by pine trees. This is a cost to the community and contrary to the Vision and Strategy which envisages that the restoration and protection of the health and wellbeing of the Waikato River will provide for the economic, cultural, social and environmental wellbeing of New Zealand.

102. Additionally, the s32 evaluation failed to address the efficiency or effectiveness of holding land uses to their historic N discharge profiles and in particular the economic implications on extensive land uses. The economic and social implications on extensive drystock farmers, which arise from these provisions have not been appropriately identified or evaluated, including: devaluation of land value and loss of equity. Increased costs associated with meeting other compliance and mitigation costs, and whether or not alternative allocation approaches will more efficiently achieve the purpose of the Act, have not been assessed.

NATURAL CAPITAL APPROACH TO ALLOCATION & NITROGEN MANAGEMENT

103. Allocation alternatives based on natural capital systems, such as LUC, categorise land according to its capacity for long-term sustained production and take into account characteristics such as soil, rock types, land form and slopes, vegetation cover and climate.

104. A natural capital-based method differs from the PC1 approach in that it contemplates the potential productivity of land rather than its current (or recent) level of nutrient discharge or type of current use. It focuses on outputs rather than inputs and provides flexibility of choice of what can be produced on the land and how nitrogen leachate (and other leachates) is managed.

105. The Courts have enumerated the benefits of natural capital based models. In summary these are:

(a) Can meet the dual requirements for economic growth and ongoing flexibility in land use, while meeting water quality targets;

(b) It is not prescriptive. It allocates N according to inherent soil productivity – irrespective of current land use or intensity of that use;

(c) It is equitable in that it treats farms with the same resources in the

same manner, regardless of current use;[61]

(d) It is portable beyond priority or sensitive catchments and can be adopted in under allocated catchments;[62] and

(e) It does not reward the highest polluters, does not penalise conservative behaviour or disadvantage owners of undeveloped land.[63]

106. In essence, a natural capital approach allocates the maximum catchment N load amongst land users in the most efficient way possible.

107. B+LNZ's original submission contemplated the following natural capital-based alternative to the PC1 regime.

Natural capital based allocation per hectare where a sub catchment nitrogen load is attributed to land based on its underlying characteristics and factors (including productive capability using the Land Use Capability classification system). This approach is used to determine the permitted baseline, and where required to stage reductions in nitrogen discharges over time […]; and

Natural capital based threshold for the discharge of Nitrogen per hectare' that is used to determine where and when Council require additional regulatory standards or stricter activity status to reduce nitrogen loss over time – based on calculating a sub catchment Nitrogen load and focussing on priority areas where nitrogen is over allocated and therefore reductions from land uses are required.[64]

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[61] Day, paragraph 5-98.

[62] Day, paragraph 5-99.

[63] Day, paragraph 5-99.

[64] B+LNZ original submission, page 33-34.

108. In its summary assessment of submissions seeking an alternative to grandparenting, including natural capital based models, the Council makes the following observations:

If the effects of the contaminants of concern are generally considered to be cumulative for the whole catchment, and there is a need for short and long-term reductions in all contaminants, then the question arises as to where the capacity or 'head-room' for intensification is to come from. The nub of the issue would seem to be that in order to allow one farmer to discharge more contaminants, then another farmer must reduce even more. Colloquially, this might be referred to as "robbing Peter to pay Paul". While what is described by submitters as a 'grandparenting' approach has equity issues, it would appear to the Officers that other approaches have considerable equity issues as well. It would be helpful if submitters that are seeking more flexibility for intensification could identify where they consider the additional reductions should occur and how any equity issues that raises would be resolved.[65]

109. To borrow the Council's analogy, in a grandparenting model farmers operating efficiently with low N losses are potentially robbed of the opportunity to take advantage of the productive potential of their soils as they are grandparented to a production level below the soil's inherent productive capacity.[66] This is to the advantage of less efficient farmers with high N losses utilising inferior soils that require increased inputs to sustain production are favoured.

110. I consider it is important when considering the equity of a particular approach to consider the RMA's overarching direction in s 5 to manage the use, development and protection of natural and physical resources that enables the social, economic, cultural wellbeing while inter alia meeting the foreseeable needs of future generations. In my opinion this means an approach that advantages less efficient land uses that, for instance operate on inferior soils and require increased inputs, should, when setting

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[65] S42A Officer's Report, paragraph 296.

[66] Day, paragraph 5-109.

regulation, be closely examined to ensure they are not being subsidised or favoured over more efficient uses.

111. In PC1, I am concerned that low emitting land uses and those that are operating below the sustainable level for the receiving environment, will be subsidising high emitting land uses and which, on the balance of the evidence, have cumulatively contributed to increasing concentrations of instream N and overallocation. In my view this is fundamentally inappropriate where there are alternatives that are measurable and implementable available, as demonstrated in this evidence and in the track change provisions at Appendix 1. In my view the approach in PC1 and the amendments proposed by the Officers are inefficient and I do not support them.

112. As noted above, in his HS1 evidence, Mr Burtt documents the significant eco-efficiency gains made in sheep and beef farming systems over the last 30 years. He explains that through continued innovation and adoption of technology (not limited to digital technologies), sheep and beef farmers have:

- increased meat production while decreasing total animal numbers;[67] and

- Reduced greenhouse gas emissions by 40% on 1990 levels for the sheep meat sector, and 10% for the beef cattle sector;[68]

113. As explained by Dr Chrystal in her evidence for Hearing 1, these farming systems have already made significant eco efficiency gains such as focussing on improving per animal performance, rather than in increasing stocking rates. Such enterprises, farming below the natural capital of their land, have "very few levers to pull" in relation to reducing N leaching further because they already have low inputs (e.g. low fertiliser use, lower stocking

[67] Mr Burtt, Evidence in Chief Hearing 1, paragraph 110.

[68] Mr Burtt, Evidence in Chief Hearing 1, paragraph 11.

rates).[69] However, research has shown that more intensive farming operations have a greater ability to reduce N leaching significantly while still retaining flexibility in farming systems and viability.[70] However, grandparenting these farms to their existing high N leaching rate offers no incentive to make these improvements in efficiency, viability and performance.

114. Dr Dewes has provided evidence to illustrate that the dairy industry has the ability to reduce emissions, and has significantly more ability to do so than drystock.[71] However, in Dr Dewes' view, regional regulatory frameworks that have utilised grandparenting regimes for allocation have placed the dairy industry under a lower compulsion to reduce its ecological footprint.[72]

115. In contrast to a grandparenting allocation model, a natural capital based allocation model provides flexibility for primary production, including intensification of that production. This can be provided by establishing a framework that encourages intensive farming towards higher quality soils, that is towards soils that will produce more and require less input for output at a given level of production than poorer soils.[73] In this sense, natural capital allocation models can create capacity or headroom for intensification by encouraging that intensification to take place on the most productive soils. As a natural capital approach is focused on outputs (N) rather than inputs (fertiliser, stocking rates etc), the flexibility of choice of what can be produced on that land, and how leachate will be managed, is preserved.

116. Headroom and capacity for intensification also comes from reducing the contaminant loading in the catchments and sub-catchments of concern so that the freshwater objectives (and the overarching objectives of the NPSFM) are achieved. In an over allocated catchment this is a necessity in order to give effect to the NPSFM. Once headroom or capacity has been

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[69] Dr Jane Chrystal, Evidence in Chief Hearing 1, paragraph 207.

[70] Dr Jane Chrystal, Evidence in Chief Hearing 1, paragraph 208.

[71] Dr Alison Dewes, Evidence in Chief Hearing 2, paragraphs 137-160.

[72] Dr Alison Dewes, Evidence in Chief Hearing 2, paragraphs 137-138.

[73] Day, paragraph 5-95.

secured, allocating the maximum N load to maintain water quality amongst land users using a natural capital approach continues to encourage and enable more intensive primary production land uses towards higher quality soils.

117. This approach is entirely consistent with the broader statutory framework. The NPSFM includes a direction to avoid over-allocation and reduce existing over allocation where it occurs (Objective A2, Policy A1). The NPSFM envisages that the management of freshwater in accordance with its objectives and policies will provide for "productive economic opportunities" (Objective A4). In accordance with the principal of sustainable management established in s5 of the RMA and the direction to avoid over allocation in the NPSFM, Objective A4 can only be realised where activities are operating within sustainable, environmental limits and/or where headroom and capacity has been created through effective management.

118. As noted by the s42A officers, a "*significant number of submitters have identified that in some sub-catchments, future water quality states are already met. Notwithstanding any discussions over a N load to come, this would suggest that, at least in these sub-catchments, 'maintaining' water quality would be appropriate*"[74]. As alluded to by the Courts, a natural capital allocation method can provide the basis of a mechanism which maintains water quality by allocating to land the in-river N load that would achieve that outcome. Weighting the allocation of that N to the most productive soils maintains and supports efficient production.

119. The changes proposed in Appendix 1 of this evidence provide, to use the words Objective (e) of the Vision and Strategy, an integrated, holistic and coordinated approach to the management of diffuse discharges associated with primary production activity. The proposed provisions provide an effective and efficient means to achieve the environmental outcomes sought by the NPSFM and the Vision and Strategy.

[74] S42A Report. Hearing Stream 2, Paragraph 286.

120. In brief the proposed changes as set out in Appendix 1:

(a) Enable through Policy 1, Policy 4, and Policy 6, flexibility in land uses and discharges of nitrogen up to the sustainable N discharge or stocking rate as provided through LUC framework and as set out in Table X below;

(b) Provide for allocation in accordance with the Natural Capital of the landscape through Policy 7;

(c) Provide implementation pathway through Permitted Activity Rule 3.11.5.2;

(d) Informs the trajectory for reductions in nitrogen discharges through Rules 3.11.5.2A, 3.11.5.3, and 3.11.5.4;

(e) The policies will be an important part of the decision making process for discretionary activities; and

(f) Schedule 1, which requires LUC mapping through FEPs to underpin land use and practice decisions by identifying and managing vulnerable landscapes.

121. I have also included two new tables that provide the limits and (as applicable) targets for N discharge and stocking rates for low intensity farming in the region; as shown in figure 1, and figure 2 respectively. These tables provide for permitted farming activities that present low risk and a minimal contribution to the nutrient loadings in the Rivers.

Figure 1: Policy 1 Table X Land Use Capability Natural Capital Based: Nitrogen Leaching Limits /Targets

Table X: Land Use Capability Natural Capital Based: Nitrogen Leaching Limits /Targets

LUC Class	Upper Waikato (kg-N/ha/yr)	Middle Waikato (kg-N/ha/yr)	Lower Waikato (kg-N/ha/yr)	Waipā (kg-N/ha/yr)
1	30	30	27	30
2	26	25	22	26
3	18	19	20	20
4	18	19	18	20
5	16	16	16	16
6	14	16	14	16
7	9	10	9	11
8	4	4	4	4

Figure 2: Table X1 Land Use Capability Natural Capital Based: Stocking Limits/ Targets

Table X1. Land Use Capability Natural Capital Based: Stocking Limits

LUC Class	Upper Waikato (su/ha/yr)	Middle Waikato (su/ha/yr)	Lower Waikato (su/ha/yr)	Waipā (su/ha/yr)
1	27	27	24	27
2	23	22	20	23
3	16	17	18	18
4	16	17	16	18
5	14	14	14	14
6	12	14	12	14
7	8	9	8	9
8	0	0	0	0

122. Figure 1: Table X, is taken from Dr Cox's evidence, however I have rounded the numbers to one decimal place, when considering the level of error associated with the modelling including use of OVERSEER as discussed in the Expert evidence of Dr Cox, Dr Chrystal, and Dr Dewes.

123. Figure 2: Table X1, is taken from the expert evidence of Dr MacKay and reflects the weighted average attainable potential for the different LUC classes in the Waikato Region.

124. I am expecting further relevant evidence will be received from other parties for HS2, which I will consider when it becomes available. I note that this further information may impact on my views on the relevant numerical limits and targets set out in Tables X and X1.

125. I also propose that the following definition be included in PC1:

Land Use Capability Class (LUC) means a classification of areas of land within a farm property or farming enterprise in terms of its physical characteristics or attributes (e.g. rock, soil, slope, erosion, vegetation). The LUC classes can be derived either from the New Zealand Land Resource Inventory or a suitably qualified person specifically assessing and mapping the land use capacity classes of land within a farm property or farming enterprise. Where the LUC is assessed by a suitably qualified person that person shall use the Land Use Capacity Survey Handbook – a New Zealand handbook for the classification of land, 3rd Edition, Hamilton., Ag. Research; Lincoln, Landcare Research; Lower Hutt, GNS Science.

126. The LUC limits / targets are derived from the instream N Freshwater Objectives described in the evidence of Dr Cox for HS2. I will provide further planning analysis once the outcomes of expert conferencing are available.

127. Dr Cox is of the view that point source discharges are a significant contributor to nutrient loads in the catchment. Table X and X1 are precautionary in nature because they assume point source discharges do not decrease. However, to give effect to the superior planning documents, point source discharges, as with diffuse discharges, must be managed in a manner that cumulatively addresses over allocation such that Freshwater Objectives are achieved overtime.

128. These changes give effect to Objectives 1 and 1B, Objective 2, and Objective 4.

129. An error of margin of ± 30% is provided for in relation to compliance against the LUC N leaching limits/ targets, in accordance with the expert evidence

of Dr Chrystal[75], and is consistent with the approach taken in Hawkes Bay Regional Council's Tukituki Plan (PC6).

130. I also propose that a five-year rolling average be applied in relation to compliance against both the LUC N leaching limit / target and the stock rates, in accordance with the expert evidence of Dr Chrystal in relation to temporal changes in pasture growth curves[76]. This is also consistent with the approach taken in Hawkes Bay Tukituki Plan (PC6)

EQUAL ALLOCATION APPROACH & NITROGEN MANAGEMENT

131. I now turn to equal allocation. Equal allocation is where the catchment load is divided by the total number of hectares in the catchment and this amount allocated as a N loss right to each hectare of land. The per hectare N discharge value has a relationship with the water quality freshwater objectives for the catchment or sub-catchment and provides a reference point for the management of farming activities. Activities that are leaching more nitrogen per hectare than the specified value are required to begin reducing their leaching over time. Activities that are leaching the value/ha/year are maintained at that value, and as with the natural capital approach activities which are under the equal allocation value can leach up to that value.

132. In his evidence for HS1 and 2, Dr Cox presents an equal allocation simulation as part of an exercise exploring alternative mitigation strategies to inform final policy setting.[77], and to inform implications of land use and land use change as a result of the instream concentrations of nitrogen established in PC1, Table 3.11-1.

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[75] Evidence in Chief Dr Jane Chrystal on behalf of B+LNZ (2019) Hearing Stream 1, para 25, page 7

[76] Evidence in Chief Dr Jane Chrystal on behalf of B+LNZ (2019) Hearing Stream 2. para 25, page 7.

[77] Dr Tim Cox, Evidence in Chief Hearing 1, paragraph 75.

133. As shown by Dr Cox, in order to achieve the currently proposed long term instream N Freshwater Objectives the entire upper catchment would be required to be afforested, as with the Waipapa catchment[78]. In comparison to the current instream concentrations, achievement of PC1 notified Table 3.11-1 instream N freshwater objectives requires net reductions of between 57 to 90%[79], and as with the scenarios completed for HS1, complete afforestation of the Waipapa catchment. Other land uses across the catchment would be constrained to extensive systems only. Under his alternative longer-term instream N Freshwater Objectives, mixed pastoral agriculture is provided for, potentially along with some more intensive land uses[80].

134. As with the natural capital approach in over-allocated catchments, an equal allocation approach provides strong regulatory incentives for those leaching above the sustainable limit to reduce leaching over time, while still providing flexibility for those under the sustainable limit. In under-allocated catchments, the approach continues to provide for intensification up to the limit, including by new entrants. In all scenarios there is a strong directive to undertake resource use efficiently.

135. Whilst the amount of N allocated in an equal allocation method is related to the achievement of environmental outcomes in river, it is not as nuanced as a natural capital approach, which recognises that not every parcel of land is the same and that soils differ in their productive capacity and in the provision of other services such as nutrient filtering.[81] Consequently, equal allocation does not provide the flexibility inherent in the natural allocation method.

136. Having considered the evidence, I conclude that natural capital is more effective and efficient as resource is allocated across the landscape in a manner which reflects the characteristics of the land and, as such, also has

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[78] Dr Tim Cox, Summary for hearing, Table 3.

[79] Dr Tim Cox, Evidence in Chief on behalf of B+LNZ (2019) Hearing Stream 2, para 33, page 13.

[80] Dr Tim Cox, Evidence in Chief on behalf of B+LNZ (2019) Hearing Stream 2, Table 3.

[81] Dr Alec Mackay, Evidence in Chief Hearing 2, paragraph 29.

other benefits in relation to managing other contaminants of concern such as sediment and phosphorus. This is because intensification is incentivised toward the land ablest to assimilate higher input systems and land which is more vulnerable. It also creates behaviour to incentivise land use change, so that it fits the landscape as well as individual and community aspirations.

137. These outcomes of a natural allocation approach are, as discussed earlier in this evidence, aligned with achieving the sustainable management of which is consistent with s5 RMA, the requirements of the NPSFM, and with the objectives and strategies of the Vision and Strategy for the Waikato River.

OVERSEER & NITROGEN MANAGEMENT

138. Technical evidence presented for HS1 by Dr Cox and Dr Chrystal unpack in some detail the issue of uncertainty associated with the use of OVERSEER as a regulatory tool. This is also addressed in the evidence of Dr Dewes for HS2. OVERSEER does not take into account the fate of nitrogen below the root zone and any attenuation that may occur.[82] I acknowledge that attenuation and lag greatly contribute to this uncertainty.[83] In his evidence, Dr Cox lists the potential contributors to attenuation, including plant uptake, absorption to soils and substrate and denitrification, water impoundments, biological activity and residence time.[84] Uncertainty associated with use of OVERSEER in regulatory environments is also exacerbated by other factors such as user input error, the quality or availability of raw data, bugs in the model and version changes as a result of upgrades to the model.[85] There is also the inherent uncertainty associated with a model of any kind, as explained by Dr Chrystal.[86]

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[82] Dr Jane Chrystal, Evidence in Chief Hearing 1, paragraph 77.

[83] Dr Tim Cox, Evidence in Chief Hearing 1, paragaph 34.

[84] Ibid., paragraph 34 and 35.

[85] Dr Jane Chrystal, Evidence in Chief Hearing 1, paragraph 92.

[86] Dr Jane Chrystal, Evidence in Chief Hearing 1, paragraph 92.

139. However, in evaluating the most effective and efficient methods for achieving the policy, alternatives to output based management frameworks which may rely on a model should be considered. Alternatives to output based approaches include input standards such as controls on activities including land uses, stocking rates, and stock type, fertiliser use, and bought in feed. Tax and rent systems can also be considered. When considered on balance to the alternatives the use of output based management frameworks such as those that rely on N leaching limit/target per ha, and which define the amount of resource available and well as the responsibilities of that land use are in my opinion more efficient and effective than alternatives.

140. One of the main reasons is because output based frameworks enable innovation and adaption and provide flexibility, whereas input types of arrangements are often more difficult to link to the environmental effect that is intended to be managed and do not provide the same level of flexibility and room for innovation as output approaches do. A simple example can be the use of stock unit limits/ targets vs N leaching limits/ targets, with the second approach farmers can choose to adopt further mitigation such as standoff pads, improved animal nutrition, to increase their stocking rate while maintaining their N discharge. Alternatively, stock units may be kept the same but changes in management such as use of winter feeds or crops may increase their N leaching.

141. As set out in my HS1 evidence, Dr Chrystal concludes that use of the tool in policy needs careful consideration to enable the appropriate use of the model to reduce risk and assist with informing on-farm management approaches. However, she is not proposing that Overseer not be used at all in regulation, given that alternatives such as input controls on stock numbers for example, have significant issues of their own. But rather, alternative approaches including consideration of thresholds should be considered in relation to establishing outcome or output based risk management

frameworks. This is a view shared by Dr Dewes, who states[87], in relation to the use of OVERSEER:

[…] it too has a place in risk analysis, as does Land Use Capability, in the management of an overallocated regime of resource use, the management of risk in relation to land use and practices given environmental limitations, assimilation capability of receiving water (Waikato water) bodies, surface water abstractions, and (planetary atmospheric assimilation)

142. As such, I agree with Council it is appropriate to use OVERSEER to support the management of nitrogen leaching in PC1, whilst acknowledging its limitations in a regulatory context.[88] . I am therefore proposing that the tool be used to access relative change in N leaching from high risk farming from their NRP and including to at or below an upper threshold (such as 60th percentile), and that low intensity land uses may choose to use Overseer as a method by which to access their compliance with the LUC N leaching limits/ Targets in Table X, Figure 1. I am proposing that provision for ± 30% be applied in relation to assessing compliance against the LUC N leaching Limits/ Targets along with a 5 yearly rolling average[89]. For low intensity land uses a stocking rate permitted baseline is also provided.

143. However, I do support providing farmers with alternatives and reducing the regulatory and administrative burden associated with having to undertake annual overseer budgets, or for every farm to have to have a budget.

144. Experts for Fonterra have proposed a Nitrogen Risk Scorecard (NRS) approach for medium intensity land uses, as a structured and repeatable means of metricising nitrogen loss risk – that is, providing a numeric risk "index" that could be used in regulatory design so as to avoid the expense

[87] Evidence in chief Dr Alison Dewes on behalf of B+LNZ (2019) Hearing Stream 2, para 157, page 37

[88] S42A Report Hearing 2, paragraph 93.

[89] Evidence in Chief Dr Jane Chrystal on behalf of B+LNZ (2019) Hearing Stream 2, para 25, page 5.

and effort of using Overseer modelling[90]. Dr Chrystal as reviewed this approach and states that[91]:

The Nitrogen Risk Scorecard approach, which is proposed for dairy by Fonterra, has significant merit and is worthy of further investigation for sheep and beef farms. It could be extended to consider high-risk natural landscapes and rainfall regions. It would complement the use of individual farm environment plans.

145. Dr Dewes also supports the NRS[92]. As such I am proposing that Schedule 1 and Rule 3.11.5.2A be amended to provide for the use of the NRS in assessing and managing risks associated with N discharges from farms. I agree with Mr Gerard, that the tool is "*certainly not more complex for farmers to understand. Indeed, one of the benefits of the approach is that farmers using the tool can transparently see and understand how adopting certain practices on farm affects N risk*".

146. The technical evidence presented by B+LNZ experts highlights significant flaws in the methodology underpinning the nutrient modelling used by Council to establish leaching profiles at the farm level for major land uses and targets and limits for nutrients, sediment and E. Coli at the farm and catchment scale. In Dr Chrystal's view, the consequence of the flaws in the HWRO economic model, which utilises OVERSEER Nutrient Budgets to establish leaching profiles at the farm level for major land uses, is that the model is:

"*unreliable at best, and could significantly misrepresent the relationship between current land uses and water quality, including significantly underestimating the amount of nitrogen that can be allocated in relation to*

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[90] Evidence in Chief Mr Gerard Willis on behalf of Fonterra (2019) Hearing Stream 2.

[91] Evidence in Chief Dr Jane Chrystal on behalf of B+LNZ (2019) Hearing Stream 2, para 27, page

[92] Evidence in Chief Dr Alison Dewes on behalf of B+LNZ (2019) Hearing Stream 2, 5.para 39, page 7.

freshwater objectives, and inaccurately represent the implications of PC1 on land owners and the environment".[93]

147. In HS1, Dr Cox also demonstrated how the models and modelling process are lacking in transparency, employ insufficient detail and are not supported by uncertainty or sensitivity analysis of any sort.[94] Exploring one specific aspect of the foundational modelling for PC1 Dr Cox concludes, in his evidence for Hearing 1, that the flaws he has identified has ramifications not only for predictive simulations but also for allocation:

"For example, different model apportionments of attenuation vs. export, for the same model calibration result, can result in different predictions of mitigation impacts […] and different per hectare nitrogen allocations to achieve a desired water quality outcome. The latter is particularly important if the model is to be used to support nutrient allocation in the future".[95]

148. Dr Cox opinion is that the issues he has identified in the modelling underpinning PC1 be addressed prior to finalisation of the Plan Change, and he offers a number of suggestions as to how this could be achieved in his HS1 evidence.[96] [97]

149. Dr Chrystal and Dr Cox's evidence was available to the s42A officers during their deliberation of submissions on Hearing 2 matters. However, I can see no indication that the concerns they raised have been considered by the Officer's when making recommendations on the role of OVERSEER in the administration and implementation of PC1.

150. I consider that the issues of inequity and unsustainability of the Council's preferred allocation method is not overcome with the proposed recommended amendments to the Plan in response to submissions.

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[93] Dr Jane Chrystal Evidence in Chief Hearing 1, paragraph 21.

[94] Dr Tim Cox, Evidence in Chief Hearing 1, paragraphs 17-18.

[95] Dr Tim Cox, Evidence in Chief Hearing 1, paragraph 138.

[96] Dr Tim Cox, Evidence in Chief Hearing 1, summarised in paragraphs 23-27.

[97] Dr Tim Cox, Evidence in Chief Hearing 1, summarised in paragraphs 142-146.

STOCK EXCLUSION

151. Policy 1, and Schedule C seek to exclude livestock namely domestic cattle, deer, and pigs from all permanently flowing waterways (irrespective of size) from 1 July 2023 within priority 1 sub catchments and by 1 July 2026 for priority 2 and 3 sub catchments, through permanent fencing or a natural barrier, up to a land slope of 25 degrees.

152. B+LNZ's submission records its concern is that overland flow is the primary route for pathogens to enter surface waterbodies in the hill country and that fencing does not stop an overland flow pathway. The cost of implementing the provisions as notified could make hill country properties financially unviable.

153. In its original submission, B+LNZ sought the following in respect of stock exclusion:

    (a) That land use and ancillary discharges objectives, policies and methods including rules recognise and provide for drystock sector farming operations, including applying the principles of addressing critical source management specific to a property rather than blunt standards such as stock exclusion through permanent fencing up to 25 degrees slope;

    (b) That PC1 should target stock exclusion requirements to intensively farmed animals on flat and rolling land, but enable flexibility for low intensity land uses and/or hill country farming;

    (c) That timeframes for environmental mitigation including stock exclusion should provide for the economic wellbeing of people and communities, resilient businesses, and enable sound business, succession, and investment planning and decisions to be made;

154. Additionally, B+LNZ also submitted that the s32 evaluation failed to address the efficiency or effectiveness of applying blanket stock exclusion provisions on land up to a slope of 25 degrees. The economic and social implications on hill country farmers, which arise from these provisions have not been appropriately identified or evaluated, including: investment in infrastructure,

tracking, earthworks, retirement of land, reticulation of water and associated ongoing maintenance, compliance and mitigation costs, and whether or not alternative prioritised investment will more efficiently achieve the purpose of the Act. Alternative provisions have not been assessed.

155. In its submission, B+LNZ sought that the stock exclusion policies and methods be amended so they are the same as the proposed national regulations, and a range of amendments to give effect to the relief sought. This included by applying the accepted principles to address critical source management specific to a property, rather than general standards, such as stock exclusion through permanent fencing up to 25 degrees slope. To give effect to this relief, B+LNZ sought a number of amendments to the provisions, particularly Policies 1(c) and 2(e) to include a threshold for stock exclusion on land up to 15 degrees slope and where break fed on land above 15 degrees slope.

156. The Officers have acknowledged that the existing Schedule C provisions are unrealistic in not having any maximum slope threshold, but have not made any specific recommendation on an appropriate slope threshold.[98] The Officers' do note that the health and safety and environmental risks of requiring fencing on land over 25 degrees are likely to outweigh the benefits due "to generally lower stocking rates".[99] They go on to acknowledge that the FEP process will enable flexibility and still provide confidence that effects are being managed on steeper slopes.[100] I agree.

157. As explained in Dr Dada's evidence presented at HS1, studies indicate that the major source of faecal pollution from agriculture in the Waikato Region is surface runoff. Mr Parkes confirms in his evidence that overland flow is the primary contaminant pathway associated with sheep and beef farming.[101] Whilst streambank fencing would reduce direct animal access

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[98] S42A Officers' Report, Hearing 2, paragraph 858.

[99] S42A Officers' Report, Hearing 2, paragraph 913.

[100] S42A Officers' Report, Hearing 2, paragraph 913.

[101] Mr Richard Parkes, Evidence in Chief Hearing 2, paragraph 21(ii).

and delivery of E. coli to water ways, in more diverse landscapes such as hill country[102] a fence does little to address overland flow pathways. Therefore there could still be elevated E.coli levels in PC1 streams that run through agricultural catchments.[103] This is echoed by Mr Beetham in his evidence, which notes that "*a fence does little to stop an overland flow event*".[104] In Dr Dada's view, a more effective response to the 'blanket fencing' method of PC1 (as notified) is to reduce the risk of pathogens from agricultural land uses entering waterbodies by identifying and managing critical source areas.[105]

158. Mr Beetham presented evidence at HS1 that costed compliance with the stock exclusion requirements of PC1. He found that the up-front capital costs to comply with the plan change including compliance with Schedule C and Schedule 1 ranged from $26,139 ($294/ha) to $541,437 ($1676/ha) per farm. Mr Beetham found that the largest costs were fencing, water reticulation, and livestock crossing structures.[106] In addition to capital costs, Mr Beetham quantified ongoing annual costs associated with compliance ranged from $5,905 ($66/ha) to $70,859 ($219/ha) per farm.[107] It was Mr Beetham's view that these costs are significant and likely to have a major impact on the ongoing viability of some sheep and beef farms in the PC1 area.

159. Dr Dada suggests that the costs outlined by Mr Beetham of implementing PC1's stock exclusion requirements may far outweigh the environmental benefits because it is by no means clear exactly where, how, and from which animals, faecal contamination is entering PC1 waterways, and in

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[102] Mixed landscapes but generally considered on average to be land with a slope over 15 degrees.

[103] Dr Christopher Dada, Evidence in Chief Hearing 1, paragraph 11.

[104] Mr Beetham, Evidence in Chief Hearing 1, paragraph 88.

[105] Dr Christopher Dada, Evidence in Chief Hearing 1, paragraph 11.

[106] Mr Beetham, Evidence in Chief Hearing 1, paragraph 86.

[107] Dr Christopher Dada, Evidence in Chief Hearing 1, paragraph 12.

some cases the action proposed will not address the effect.[108] Mr Parkes also indicates in his evidence that the nature and scale of contaminant loss via overland flow from sheep and beef farms is also highly variable across the region.[109] Whilst some of the fencing required by PC1 may be effective in interrupting faecal pathways from primary production land to waterways, some landowners will be subject to significant unnecessary cost of installing fencing that will have little environmental benefit. Dr Dada also suggests widespread microbial source tracking studies (MST) to provide greater certainty regarding the contributory sources of faecal pollution and help tailor effective mitigation efforts for the PC1 streams.[110]

160. The significant costs combined with the uncertainty of the science underpinning the Council notified approach and that also surrounds its potential environmental benefits warrants, in my view, consideration of alternative approaches. I therefore agree with the Council's consideration of imposing an alternative slope threshold in Schedule C.

161. B+LNZ sought the inclusion of a slope threshold for stock exclusion measures of up to 15 degrees where there is no breakfeeding, and above a 15 degree slope where there is breakfeeding. This is consistent with the draft proposals released under the previous Government's Clean Water Consultation document in February 2017, and which were consistent with Land and Water Forum recommendations.

162. Early in their national collaborative discussions the Land and Water Forum agreed that excluding stock from waterways was a significant tool to support improvements in water quality, and is a fundamental first step in implementing good management practice on farm, especially in relation to dairy farming and intensive farming systems. However, it was also recognised that excluding stock from waterbodies could be achieved through different management approaches, other than blanket fencing requirements, and that blanket stock exclusion is not appropriate in all

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[108] Dr Christopher Dada, Evidence in Chief Hearing 1, paragraph 12.

[109] Mr Richard Parkes, Evidence in Chief Hearing 2, paragraph 21(ii).

[110] Dr Christopher Dada, Evidence in Chief Hearing 1, paragraph 12.

circumstances. In particular, it was recognised that blanket stock exclusion requirements are not appropriate in the more challenging landscapes such as hill country, for all waterbodies such as ephemeral waterbodies, and where the farming system was extensive. These exceptions arose as inclusion within blanket stock exclusion regulation would place a significant financial burden on these farming businesses, which was not balanced by environmental benefits to freshwater ecosystems, and in some cases could instead lead to perverse environmental outcomes.

163. The Clean Water Consultation document draft proposals[111] include recommendations to exclude domestic cattle, deer, and pigs from permanently flowing waterbodies, natural wetlands, and lakes over defined timeframes, up to a land slope of 15 degrees, or where breakfeeding animals. The recommendations are summarised under Figure 3 of the Clean Water Consultation Document (February 2017) and are replicated below.

164. The 2017 draft national policy and the LAWF recommendations are matters of consideration in relation to the provisions of PC1. The proposals do not establish a stock unit/ ha standard in relation to exclusion requirements, however they do differentiate between dairy cattle, and beef cattle and deer. It does this through the provision of longer timeframes for the exclusion of beef cattle and deer, and limiting exclusion to land under 15 degrees and to waterbodies over 1m wide on rolling land (3 to 15 degrees slope). These recommendations take into account the costs of excluding cattle and deer from waterbodies and weighs these against the environmental benefits, concluding that less stringent requirements and longer timeframes are appropriate for more extensive farming land uses.

[111] Clean Water Consultation Document (2017) Table 1, page 29

Figure 3: Clean Water Consultation Document (2017)[112]

<table>
<tr><th>Farm/stock type</th><th>Plains (0-3˚)</th><th>Undulating / rolling land (>3-15˚)</th><th>Steeper land (>15˚ and over)</th></tr>
<tr><td>Dairy cattle (on milking platforms) and pigs</td><td colspan="3">1 July 2017 for waterways over 1 metre wide on all slopes
1 July 2020 for waterways less than 1 metre wide on the plains</td></tr>
<tr><td>Dairy support (on either land owned/leased by the dairy farmer or third party land)</td><td colspan="2">1 July 2022 for all waterways on the plains regardless of size and waterways over 1 metre wide on rolling land</td><td>Only where break feeding, by 1 July 2022</td></tr>
<tr><td rowspan="2">Beef cattle and deer</td><td>1 July 2025 for all waterways regardless of size</td><td>1 July 2030 for waterways over 1 metre wide</td><td></td></tr>
<tr><td colspan="3">Where break feeding, by 1 July 2022</td></tr>
</table>

165. In my opinion extending the stock exclusion provisions beyond those set out in the Clean Water Document (2017) comes at a significant cost to the farmer, and is not effects based.

166. As explained in Mr Beetham's evidence, the Clean Water Consultation Document (2017) proposed the 15 degree threshold as it reflected the practicalities of fencing on steep hill country, the high costs relative to the environmental benefits and the recognition that fencing is not an effective mitigation for hill country.[113] In my opinion, the combined evidence of Dr Dada, Mr Parkes and Mr Beetham indicates that a slope threshold of up to 15 degrees for stock exclusion would be more effective and efficient to achieving PC1's Objective 1, 2, and 4, than the up to 25 degree slope threshold as notified.

[112] Clean Water Consultation Document (2017) Table 1, page 29.

[113] Mr Beetham, Evidence in Chief Hearing 1, paragraph 22.

167. I therefore propose the amendments set out in Appendix 1. These include amendments to Policy 1, Schedule C, and Schedule 1 to provide for the following:

On land that is less than 15 degrees in slope, require livestock (other than sheep) to be excluded from lakes, wetlands and flowing rivers in accordance with Schedule C; or

i. *where not reasonably practicable to exclude stock then require actions through Farm Environment Plan in accordance with Schedule 1 to manage stock away from waterbodies including identification and management of critical source areas; and*

ii. *on land that is greater than 15 degrees in slope and where the stocking rate of livestock excluding sheep exceeds 18 stock units per hectare in accordance with Schedule C, either:*

a. *progressively exclude livestock (other than sheep) from lakes, wetlands and flowing rivers; or*

b. *where not reasonably practicable to exclude stock then require actions through farm environment plans in accordance with Schedule 1 to manage stock away from waterbodies including identification and management of critical source areas.*

168. I also consider that slope can be defined as the Land Use Capability average slope class for the mapped unit. Where the mapping can either be at the 1:50,000 scale from the National LRI, or more appropriately at the 1:10,000 scale as provided by farm scale or paddock scale LUC mapping. Both Mr Parkes and Mr Stokes provide expert evidence on stock exclusion and methods for managing stock away from waterbodies and reducing risk of pathogen discharges, as well as methods for determining slope thresholds at the farm scale.

169. PC1 proposes minimum setback distances from waterbodies in relation to new fences installed after 22 October 2016, which has been recommended by the s42A report to now include up to 3m for land above 15 degrees slope

and 10 metres in relation to watercourses that are the full responsibility of a territorial authority or Waikato Regional Council for maintenance purposes.

170. B+LNZ submitted in opposition to standards relating specifically around the requirements for specified setback distances from waterbodies. A range of factors contribute to determining the appropriateness of management approaches including setback distances when managing the risk of overland flow of contaminants including sediment to receiving waterbodies. Factors include geology, soils, slope, climate, vegetation, and the activity. In some instances, setback distances less than 5m may be sufficient, especially where management practices include provisions of bunds and interception structures. In other circumstances 5m may not be sufficient enough to manage the risk of overland flow especially as slope increases, and where soil is unstable.

171. As such requiring a setback distance for new fencing of 1m for flat land to rolling land, and 3m in the hill country does not appear to be effects based. I recommend deleting clause 2(b). A more effective and efficient method would be to provide a tailored approach to stock exclusion in the hill country, and riparian setback distances from waterbodies more broadly, through tailored FEP.

172. Provision of prescriptive riparian setbacks fail to account for the multiple parameters which govern the risk of contaminant discharges to surface waterbodies and unlikely to prove efficient or effective. A more nuanced and tailored approach to riparian setback distances which take into account the matters raised above are therefore more appropriately addressed through Schedule 1.

173. The s42A officers recommend including provision for stock crossing when being supervised and actively driven across a water body in one continuous movement, provided no more than one crossing per week. I support this recommendation.

FARM ENVIRONMENT PLANS

174. The s42A Officers describe Farm Environment Plans (FEPs) as being a key component of PC1, intended to guide the adoption of a range of farm-

specific actions to reduce contaminant losses. Elements of the proposed content and structure of the FEPs was a key area of concern in the B+LNZ original submission. I expressed the view in my evidence for Hearing 1 that tailored FEPs, focussed on reflecting the natural character of the farm in its catchment context, along with the identification and management of critical source areas, provides an approach which is farm and catchment specific, adaptable and can be implemented and owned by farmers and communities.[114]

175. Having considered the technical evidence, I consider that some of the standards however, such as the blanket stock exclusion requirements through permanent fencing, and restrictions on N discharges for lower leaching land uses, and requirements for (as yet undefined) minimum standards for Good Farming Practice, are contrary to the principles of tailored farm specific planning, which as I understand it, derive their effectiveness from a basis of:

(a) understanding and documenting the farms natural resources;

(b) considering the vulnerability and opportunities that these resources provide;

(c) identifying critical source areas; and

(d) then putting in place time bound actions that avoid, remedy, or mitigate the impacts of farming on the environment.

176. As set out in the evidence of Mr Parkes, correctly tailored use of farm planning tools is critical in balancing the implementation of mitigations within farm system objectives to improve whole system sustainability. B+LNZ support Land environment plan (LEP) and Farm Environment Plan (FEP) delivery through a series of facilitated workshops, where farmers are assisted to identify environmental risks on their individual properties and to put in place a set of agreed actions to manage this risk. I understand that

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[114] Clean Water Consultation Document (2017) Table 1, page 29.

[114] Mr Beetham, Evidence in Chief Hearing 1, paragraph 22.

this approach is important in assisting famers in forming the knowledge connections required for them to own and implement these plans. These actions are prioritised and given a budget allocation from year to year. The identification of these risks and agreed actions is undertaken in a whole farm systems approach to managing the effect of the operation on the environment and optimal resource use, by matching appropriate land use to different areas of the farm while achieving production and development goals for the property.

177. As such Farm Environment Plans, and the process of engaging farmers in their development, empower greater understanding of the farms natural character in the context of its wider landscape, and provide a risk matrix for activities including land uses, that enable farmers to make informed decisions about the use of their land and their management practices over the long-term.

178. Application of FEP's through methods which facilitate an individualised farm scale risk assessment, taking into account the sub catchment Freshwater Objectives, limits and targets, is therefore an efficient and effective approach to empowering farmers to sustainably manage their natural resources in an integrated and targeted manner.

179. As set out in the evidence of Mr Stokes, farms are a mosaic of soils, and land types each with different capabilities and limitations. These limitations affect productivity, the number and complexity of corrective practices needed, environmental risks, and the intensity and manner of land use. Limitations include susceptibility to erosion, steepness of slope, depth of soil, soil texture, structure and nutrient supply and climate. Understanding soil and its capabilities and limitations enables farmers and land managers to optimise the use of their natural resources while managing environmental risks and reducing costs. The classification of land through LUC according to its capability for long term production, based on its physical limitations and site specific management needs, provides the most reliable basis on which to promote sustainable land management.

180. The changes I have proposed to Policy 2 and Schedule 1 in Appendix 1 are intended to recognise the role FEPS play in information gathering that, in

turn, leads to ownership by farmers in implementing solutions and practice changes to address the sustainable and integrated management of their natural resources, including management of diffuse discharges of contaminants to surface waterbodies:

(a) Delete reference to Good Farming Practice (this is discussed in the next section);

(b) Require LUC analysis which informs landscape vulnerabilities and informs management responses including stocking management policies. Provide for either farm scale mapping (1:10,000) or as appropriate coarser scale mapping (1:50,000);

(c) Definition for LUC;

(d) Incorporation of Nitrogen Risk Scorecard Assessment for medium intensity land uses;

(e) Link FEP actions to sub catchment Freshwater Objectives, Limits, and/ or Targets;

(f) Where reductions in discharge[s] of contaminant[s] is required, that this is proportionate to the water quality improvements required in the sub- catchment as set out in Table 3.11-1 and proportionate to the discharge level of the activity;

(g) Application of NRP to high risk activities only and require a sinking lid approach to reducing nitrogen discharges to the upper threshold [X^{th} percentile] by 2026;

(h) Definition for Critical Source Area;

(i) Amendments set out under Schedule C

181. The benefits of a sub-catchment approach have been discussed in this evidence. These benefits apply to farm specific environmental mitigation based on the sub-catchment or receiving water body water quality and identified issues, if any. This approach ensures that the level of regulation and methods required to achieve improved management practice is

commensurate with the level of risk and effects on water quality and the values. The best way to address these issues is through farm-specific FEPs, which allow the level of risk to be understood, which I have promoted and discussed in this evidence.

GOOD FARMING PRACTICE

182. Section 42A report recommends the inclusion of Good Farming Practices (GFP) to Policy 1, Policy 2, and Schedule 1. However, GFP is not defined. GFP is a difficult concept to capture in regulation because it is highly dependent on the circumstances of a particular property and its use.

183. The report is not clear and consistent on what it means by GFP and how GFP on particular farm will be determined. The definition of GFP is greyed out in the "tracked change" version of PC1 appended to the s42A report and hence I understand it will be addressed as part of a later hearing. However, the process described in the paper included at page 61 (prepared by Mr Dragten) refers to applying the 21 GFP principles, which are a suite of voluntary industry agreed and approved principals. As set out in the evidence of Mr Parkes[115]

The Good Farming Practice (GFP) Action plan is a voluntary commitment and like the 21 GFPs it contains, it was not developed for the purpose of becoming regulation. Good Farming Practice (GFP) are intended to be an evolving suit of practical measures, and as such I do not support their inclusion through regulation in a way that is prescriptive and reduces the role of innovation and on farm adaption. The B+LNZ LEP programme will both deliver and drive the evolution of the Agreed National Good Farming Practice Principles for the Sheep and Beef Sector.

184. As such GFP seems to me to be a different concept than applying principles or undertaking farm-specific contaminant loss risk assessment. That being the case, I record now that I recommend deleting reference to GFP from

[115] Evidence in Chief Mr Richard Parkes on behalf of B+LNZ (2019) Hearing Stream 2, Para 20, page 5

Policy 2 and Schedule 1 and will return to the matter once the Council presents further evidence.

NEW POLICY 1A & IMPROVING LINE OF SIGHT

185. As proposed PC1 fails to provide a clear line of sight between the values for freshwater in the catchment, including at an appropriate scale of resolution to give effect to the NPSFMW, freshwater ecosystem outcomes including numerical water quality objectives, the establishment of targets or limits which achieve the freshwater objectives, policies which achieve the objectives and methods which achieve the policies. I have addressed that at the objective level in my HS1 evidence. Given the importance of my proposed Policy 1A there is merit in my explaining it further here.

186. In my view the policies as proposed in notified PC1 and the Officers' report fail to provide a clear course of action to achieve or implement the objectives of the plan, and fail to recognise the link between the Vision and Strategy, the values, the objectives and the methods. In the Officers' recommendations Policy 2(c), (d) and (e) have been deleted and relocated (to a certain degree) to Policy 1. The effect is that there is still no policy that effectively addresses the issue of over-allocation or provides a meaningful link between the values and the limits and targets intended to support them.

187. The policies should adopt a sub-catchment management approach and recognise and provide for tailored risk and effects based management. I therefore propose that a new policy Policy 1A: Management of surface water quality to limits and targets, is included that specifically implements Objectives 1 and 1B, by linking the Freshwater Objectives to the values and the establishment of limits and loads to support the efficient and effective use of natural resources to achieve freshwater objectives.

Policy 1A: Management of surface water quality to limits and targets

a) *Manage surface waterbodies in Freshwater Management Units by: In surface water bodies at the sub catchment freshwater management unit scale the Waikato Regional Council will in Table 3.11-1:*

b) *Setting instream water quality and load limits and targets in Table 3.11-1 at the sub catchment to provide for the protection or where degraded restoration of the habitat and health of aquatic ecosystems;*

c) *Manage both point source and diffuse discharges of contaminants in the sub catchment so that:*

i. *Where water quality currently meets the relevant Table 3.11-1 Freshwater Objectives, water quality limits continue to be met beyond the zone of reasonably mixing; and*

ii. *Where water quality does not currently meet the relevant Table 3.11-1 water quality freshwater objectives, water quality must be managed in a manner which progressively improves existing water quality relevant to the parameter exceeded, in order to meet;*

iii. *The water quality target for the sub-catchment by 2096, and/or*

iv. *The relevant value that the water quality target is designed to safeguard.*

"COMMUNITY RESPONSIBILITY" TO CONTRIBUTE TO REDUCTIONS OF DIFFUSE DISCHARGES TO FRESHWATER

188. The s42A report states:

"*Officers note that all landowners are required to take action to improve water quality, regardless of whether their particular sub-catchment meets water quality targets, as relatively small contributions in multiple sub-catchments can cumulatively result in exceedances in water quality targets in the wider catchment, and the modelling undertaken has made some basic assumptions about the adoption of contaminant loss actions by all farmers. It is not recommended that [the B+LNZ and others'] submissions are*

adopted as the main direction is for all land owners to take action to improve water quality".[116]

189. I agree that water quality is a community responsibility. However, reducing over-allocation over agreed timeframes is a priority requirement of the NPSFM (Objective A2, Policy A1). Yet, over-allocation is not referenced in any of the provisions of PC1 as notified. This, in my view, is inconsistent with the Council's obligations under the NPSFM and fails to provide important statutory context within which the implementation of the overall plan change can be understood by landowners and must operate.

190. The Officers' interpretation of the overall community's responsibility to improve water quality is also inherently unfair and, in my view, inconsistent with the requirements of the NPSFM. It requires that even where water quality targets within a sub-catchment are being met, landowners will need to do even better. This is at odds with the NPSFM direction to regional councils to set freshwater objectives, Limits, Targets and methods in regional plans so that freshwater objectives are achieved, over allocation is avoided, and existing over allocation is phased out over time. It should follow that limits and targets at the sub-catchment level must be set in a way that ensures limits and targets set elsewhere in the catchment can be met (or at least not undermined).

191. Helping to achieve a limit or target in a sub-catchment may require landowners to adjust existing practices, adopt new ones, invest and innovate in technology or methods to reduce emissions, which will have costs (in a s32 sense). Yet, the Officers' are suggesting that a landowner fairly contributing to meeting their obligations under PC1 cannot, by definition, be enough.

192. I also consider that the Officers' stance on community responsibility is directly contradicted by the provisions of PC1 as notified. As set out by the experts for B+LNZ, PC 1 will not result in an improvement of the quality of fresh water in water bodies that have been degraded by human activities to

[116] S42A Report, Hearing 2, paragraph 580.

the point of being over-allocated, particularly in relation to N concentrations in ground and surface water bodies, because those activities which have caused or contributed to the degradation are not required to reduce contributions by any significant amount. Plan Change 1 provides for higher discharges (those up to the 75th percentile) to continue to discharge at their historic rate, even though this will not give effect to the NPSFM or the Vision and Strategy.

SCHEDULE B NITROGEN REFERENCE POINT

193. I consider that the NRP has a role for high emitting farming as a way to benchmark emissions, and then in establishing a trajectory of reductions, or sinking lid, so as to signal the changes required to achieve Freshwater Objectives. My position on the appropriateness of a NRP for those emitters is set out above. I have made consequential amendments to Schedule B to better reflect best practice when identifying the NRP.

DATED 9 May 2019

Ms Corina Jodi Jordan