IN THE MATTER of the Resource Management Act 1991

AND

IN THE MATTER of the hearing of submissions on Proposed Plan Change 1 (and Variation 1) to the Waikato Regional Plan

TOPIC 3

BY **FEDERATED FARMERS OF NEW ZEALAND INC, FEDERATED FARMERS OF NEW ZEALAND (WAIKATO REGION) 1999 INCORPORATED, FEDERATED FARMERS OF NEW ZEALAND – ROTORUA TAUPO PROVINCE INCORPORATED, FEDERATED FARMERS OF NEW ZEALAND (AUCKLAND PROVINCE) INCORPORATED**

("FEDERATED FARMERS")

Submitter with ID: 74191

To **WAIKATO REGIONAL COUNCIL**

STATEMENT OF REBUTTAL EVIDENCE OF IAN FRANCIS MILLNER FOR FEDERATED FARMERS ON HEARING TOPIC 3

19 July 2019

FEDERATED FARMERS OF NEW ZEALAND

169 London Street
PO Box 447
Hamilton
Telephone: 021 110 3554
Email: mmeier@fedfarm.org.nz

1. SUMMARY

1.1 As with my Block 3 evidence, a primary focus of my rebuttal evidence is on minimum standards and the content of Farm Environment Plans ("FEPs"). Several submitters have proposed the use of more specific minimum standards (such as WRC as submitter, DOC and Fish & Game). However, I consider that care and caution ought to be exercised in setting minimum standards.

1.2 Any minimum standards ought to be the minimum outcomes expected in most cases. This is a difficult task in a catchment that is as varied as PC1 (both spatially and in farm systems) and will likely lead to unintended consequences or uncertainties if we attempt to achieve too much specificity or prescription.

1.3 The objectives of PC1 (i.e. 10% of the 80 year journey), the likely benefits and the associated costs ought to be borne in mind when considering minimum standards and the prescription for FEPs. The content of FEPs is an area that could benefit from focused and directed expert caucusing.

1.4 Given the issues associated with the NRP and Overseer, my view is that a pragmatic approach is needed and that any attempt to make Overseer input standards conditions of consent (as proposed by WRC as submitter) ought to be saved for section 127 review situations.

1.5 My response to WRC's Memorandum dated 5 July 2019, particularly issues regarding the definition of slope and stocking rate, further illustrates the need for caution in striving to achieve greater specificity and prescription. In my opinion an appropriate outcome can be achieved in the next 10 years if we focus on working with farmers to obtain FEPs quickly and reasonably, as opposed to focusing on trying to remove all subjectivity and standardise the process.

2. INTRODUCTION AND SCOPE

2.1 My full name is Ian Francis Millner. I am a Senior Land Management Adviser at Rural Directions Advisory Services. A full description of my qualifications and experience is contained in my statement of evidence on Hearing Topic 2 dated 3 May 2019.

Code of Conduct

2.2 I confirm that I have read the Environment Court's Code of Conduct for Expert Witnesses as set out in the Environment Court's Practice Note 2014, and I agree to comply with it. I confirm that the issues addressed in this statement of evidence are within my area of expertise, except where I state that I am relying on the evidence of another person. I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed.

Scope of Evidence

2.3 This rebuttal evidence responds to matters raised in evidence filed by:

a. Mr Edlin and Mr Lynch for Waikato Regional Council ("WRC") as submitter.

b. Ms McArthur and Ms Kissick for the Department of Conservation ("DOC").

c. Ms Marr for Fish & Game.

d. Mr Willis and Mr Richard Allen for Fonterra.

e. Mr Gasquonie for WRC as proponent.

f. Mr Lowe for the Waikato and Waipa River Iwi.

g. Ms Jordan for Beef + Lamb.

h. Mr Andrew Barber for Horticulture New Zealand.

2.4 I also respond to the Waikato Regional Council ("WRC") memorandum dated 5 July 2019.

3. RESPONSE TO SUBMITTER EVIDENCE

3.1 In this section of my evidence, I set out my response to the submitter evidence on Block 3. Due to the overlap in the issues and my responses, I have grouped my responses by topic as opposed to submitter. My responses are organised by the following topics:

a. Minimum standards:

   i. Purpose of minimum standards.

   ii. Environmental and financial implications of minimum standards

   iii. Removal of subjectivity from FEPs

   iv. Focus of FEPs on minimum standards

   v. Focus of FEPs on practices

   vi. GFP practices in document outside PC1

b. NRP and Overseer:

   i. Compliance with NRP

   ii. Permitted vs consented activities

   iii. Submission of NRP

   iv. Nitrogen risk scorecard and nitrogen surplus

c. Nitrogen use efficiency and minimise

d. Table 3.11-1

e. Commercial vegetable growing

Minimum standards

3.2 A matter that has been raised by various submitter groups (including Fish & Game, DOC, Fonterra and WRC as submitter), is whether additional minimum standards are needed if the FEPs are to be based on GFP principles. Currently, Schedule C of PC1 contains minimum standards relating to stock exclusion and setbacks. There is a GFP principle proposed in Schedule 1 that relates to stock exclusion. Two issues raised by submitters are:

a. Whether the setbacks ought to be more stringent (i.e. wider) to provide a "minimum standard" for a range of other "high risk" farming activities.

b. Whether additional specified standards or practices need to be provided for in Schedule 1.

3.3 For some submitters (e.g. Fonterra), this appears to be in response to questions raised about the Hearing Panel about whether the FEP requirements are sufficiently certain to be used for permitted activities. For other submitters (e.g. Fish & Game), this appears to be in response to the significant changes to Schedule 1 proposed by the section 42A report, and a view that the GFP principles are not sufficiently defined.

3.4 My views on the use of GFP principles and potentially providing for greater prescription for FEPs to be prepared as permitted activities are set out in my Block 3 evidence. This rebuttal evidence focuses on responding to issues raised in this context by other submitters that I did not address in my Block 3 evidence.

3.5 During the Block 2 hearings, the Hearing Panel has also asked questions like whether there should be minimum standards, what should they be and if there are few or none, how can they be sure that the water quality outcomes will be achieved. I consider my views on these questions are addressed in the context of my responses to the submitter evidence.

Purpose of minimum standards

3.6 Before specifically responding to the various minimum standards proposed by submitters, I consider that the purpose of and context within which the minimum standards are being proposed is important.

3.7 In my opinion, minimum standards should, by definition, be the minimum outcomes expected in most cases i.e. exceptions to them should be in exceptional cases and not the norm. I also consider that minimum standards ought to be viewed in the context of what PC1 is trying to achieve i.e. 10% of an 80 year journey. The focus is on GFP and starting water quality improvements; it is not on making the greatest improvements possible.

3.8 In my opinion, the greatest benefits or gains will be made through farmers obtaining a FEP as quickly as possible and starting on this journey. Simply the act of most farmers fencing streams with a 1m setback (I say “most”

because there will need to be exceptions for hill country farms that are not practicable to fence or that can come up with suitable alternatives), will be a significant improvement on the status quo.

3.9 My concern with the minimum standards proposed by several other submitters is that this is not the context within which they are proposed.

3.10 By way of illustration, Mr Edlin for WRC as submitter proposes at paragraph 54 of his evidence that a minimum setback of 5m is adopted. One of my concerns with this approach is that I can envisage a large number of farmers needing to obtain consents for setbacks that are less than 5m (contrary to Mr Edlin's views at paragraph 57 about this being uncommon).

3.11 I am aware of many examples in the Waikato of situations where a 5m setback will not be appropriate due to factors such as slope running parallel with streams (rather than towards streams) and surface channelization. An example of this is provided at Annexure IFM1 of my Block 3 evidence, where I illustrate that surface flows are running parallel to the stream and it would make sense to have an appropriate setback in the one corner of the paddock where the surface flow is running into the stream.

3.12 In my opinion, an approach that tailors the setback to the specific issues on site is a more efficient use of limited farm capital to achieve the outcomes of PC1. The Panel has seen and heard many presenters, particularly drystock farmers, who have requested such an approach. In my view, this will achieve greater farmer buy in (which will be vital for the effective implementation of PC1).

3.13 At paragraph 59, Mr Edlin states that identifying minimum standards is not straight forward, and at paragraph 60 he states that clear minimum standards have the advantage of providing clarity for farmers, CFEPs and Council. I agree with both of those statements but I do not agree with Mr Edlin's response, which is to propose minimum setback standards for all activities (or, at least, high risk activities). While setback standards are relatively easy to set, they will create significant difficulties in practice.

3.14 It appears that Mr Edlin, on behalf of the WRC implementation team, is grappling with the issue of how to balance the need for certainty (from a

regulatory perspective) with the need for flexibility (from a farming perspective). I am concerned that Mr Edlin's response is to tip that balance in favour of certainty, with the impact falling on farmers who will lose significant flexibility. I agree that an appropriate balance needs to struck but I do not agree that that will be achieved through more stringent setback standards. In my experience it is farmers who experience the full burden of implementation and it is they who should be afforded flexibility. This principle can only improve the achievability of PC1.

3.15 By way of example, at paragraphs 62 to 65, Mr Edlin identifies four activities that he considers to be "high risk" and his proposal is to address them by adopting setbacks of 5-10m as minimum standards. I agree that these[1] tend to be higher risk activities, but this is not an exhaustive list and in respect of each of these types of activities there will be more than one potential mitigation. The issue is that appropriate flexibility needs to be provided to tailor the mitigation to the specific circumstances, and exceptions to a 5m minimum setback for these activities will likely be the norm rather than exception.

3.16 Taking the grazing of winter crops as an example, there may be situations where a 5m setback from connected waterways is not appropriate. However, as I explained to the Hearing Panel during my Block 2 evidence, there is a need for further investigation. In the example I presented on 15 July 2019, I showed that further investigation found that whilst the paddocks being winter grazed were adjacent to a stream they were not directly connected to that stream. This meant that as opposed an infrastructure response (e.g. fences with 5m setback), it was possible to design an effective grazing management response.

3.17 I acknowledge that if 5m was the minimum setback distance, and if a farmer proposed a grazing management response instead, that could be considered as part of a consent application. However, my concern is that such an example is not likely to be an exception to the rule (in a diverse catchment like

[1] Mr Edlin's list of high risk activities is at paragraph 62 of his evidence where he lists "cultivation of land, grazing winter forage crops in-situ, the use of sacrifice paddocks, fertiliser application during winter months."

PC1 it is likely to be too common to be an "exception") and therefore I consider that it would be inefficient and expensive for both farmers, CFEPs and WRC to treat it as something appropriate for an alternative consent process (as Mr Edlin proposes at paragraph 57).

Environmental and financial implications of minimum standards

3.18 At paragraph 68, Mr Edlin appears to recognise the need for a tailored approach on drystock farms and the potential financial implications of applying rigid and stringent minimum standards to these farms. However, I do not agree with his conclusions that there will be few activities affected or that the cost to the environment outweighs the likely impact on farm systems. As the Panel has heard to date, there are many drystock farming operators coming forward to give evidence about the significant impacts of the notified stock exclusion and setback standards on their farm systems. Based on my knowledge of the PC1 catchment (geography and farm systems), I consider that this is likely to be more reflective of the status quo (and not limited to a "few activities" as Mr Edlin suggests).

3.19 The NIWA report cited in my Block 2 rebuttal evidence supports my views.[2] That report indicates that in 2012 hill country drystock comprised 124,900ha and intensive (lowland) sheep and beef comprised 246,600ha within the area specific to PC1.

3.20 Mr Edlin does not quantify the cost to the environment. However, I note that TLG concluded that a 5m setback was not needed everywhere and the policy mix would still exceed the 10% required improvement.[3]

3.21 On the issue of the benefits of different setback distances, Ms McArthur for DOC, at paragraph 26 of her Block 3 evidence, states that FEPs should have minimum riparian setbacks as set out in her Block 2 evidence (where she also discusses the literature regarding the benefits). This is reflected in minimum

[2] Review of historical land use and nitrogen leaching: Waikato and Waipa catchments, Waikato Regional Council Technical Report 2018/35 https://www.waikatoregion.govt.nz/assets/WRC/Services/publications/technical-reports/HRWO-trs/TR201835.pdf

[3] As explained in Dr le Miere's Block 3 evidence at paragraph 42.

setbacks (ranging from 5m to 20m) recommended at paragraph 151 of Ms Kissick's planning evidence.

3.22 At paragraphs 38 and 39 of her Block 2 evidence, Ms McArthur identifies that the literature on setbacks is "varied and equivocal" but concludes that slope is an important factor and wider setbacks are usually better for contaminant removal. My concern is that this is a risky foundation for putting forward stringent setback distances as a minimum standards. Particularly in the context of a plan that is focusing on 10% improvement in the first 10 years and a plan that is likely to significantly overshoot this improvement, with setbacks of less than 5m. Further, in the context of the associated on farm cost (as identified by Dr le Miere and summarised in the graph below), it seems to be a very expensive and unjustified approach.

3.23 Returning to paragraph 68 of Mr Edlin's evidence, he does not quantify the impact on farm systems but I note that Dr le Miere has quantified the likely costs to drystock farmers as a result of fencing and various setback costs in Annexure PLM2 of his Block 3 evidence. Dr le Miere's analysis does not include the costs of water reticulation or stock crossings, and the costs of fencing are an average (many streams hill country farms would cost more than $15 per metre to fence). While it also does not consider any fencing not required as a result of any slope threshold, I consider that Dr le Miere's cost estimates are likely to be on the conservative side (they do not include most intermittent streams and some permanent waterways).

3.24 Dr le Miere's evidence shows that the cost of fencing and setbacks increase significantly as setback distances increase. I plotted Dr le Miere's costings in the following bar graph to illustrate this:

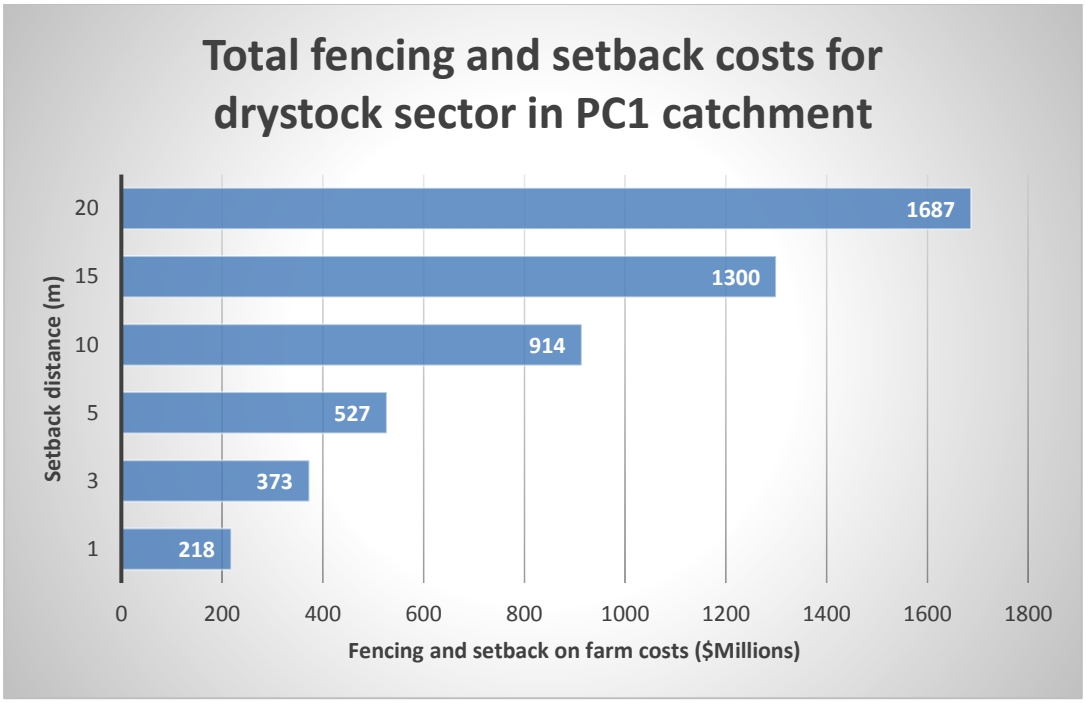

Figure 1: Total fencing and setback costs for 1m to 20m setbacks for drystock sector (source: Annexure PLM2 of Dr le Miere's Block 3 evidence)

Removal of subjectivity from FEPs

3.25 Ms Marr proposes that language such as "where appropriate," "when practicable" or "as far as possible" is not to be used in FEPs and instead FEPs should set out clearly the circumstances when an actions or restrictions will or will not be followed (first paragraph on page 26 of Ms Marr's Block 3 evidence). While Ms Marr is attempting to ensure greater certainty, I am concerned that such a direction is likely to inappropriately restrict the flexibility needed to appropriately tailor FEPs.

3.26 It is not possible to contemplate every scenario and if FEPs are too rigid in their wording, or the process is too defined, then we risk creating a framework that will likely fail. FEPs are living documents and it is not possible to fully contemplate the extent of actions at the outset. FEPs need to recognise that farmers are living in a constantly changing or evolving environment (this was partially illustrated in Annexure IFM1 of my Block 3 evidence and in the photographs I presented at the Block 2 hearing).

3.27 Farm systems are devised around the generally prevalent farm conditions, as a range (i.e. not a point in time). As such, we may design farm mitigations that

manage the activity within that range of conditions but they may not be effective when faced with a storm event of 1 in 50 year magnitude, for example. This may necessitate the use of wording such as “where possible” or “where practicable.”

Focus of FEPs on minimum standards

3.28 Ms Marr, for Fish & Game, proposes amendments to Schedule 1 to require FEPs to clearly identify how specified minimum standards will be met. While I consider that there may be grounds for the Hearing Panel to adopt a more specific FEP schedule for permitted activities, as explained in my Block 3 evidence, I do not agree with the minimum standard approach proposed by Ms Marr or with the proposal that this should apply to all farmers (and to FEPs obtained by consent).

3.29 Ms Marr proposes the addition of minimum standards to accompany many of the principles in Schedule 1. In my opinion, many of the matters she has inserted are not “minimum standards” but instead provide further guidance or specificity to the GFP principles. There are some that might be appropriate, with suitable wording changes. For example, in principle, I support the identification of ephemeral waterways and overland flow paths, and the development of an appropriate stock management policy to address contaminants from or to these areas. However, I consider paragraph C on page 29 of Ms Marr’s evidence needs further refinement if it was to be inserted into Schedule 1.

3.30 There are other matters that I do not agree with because I consider that they are too rigid, such as a minimum cultivation setbacks of 10m (paragraph S on page 31 of Ms Marr’s evidence). I refer to my reasons above, as well as those explained in my Block 2 and Block 3 evidence.

3.31 In addition, there are matters included in Ms Marr’s changes that go beyond the objective of PC1 and/or are too inflexible, such as the proposal that land use is matched to land capability (paragraph U(i) on page 31 of Ms Marr’s evidence). An assessment of LUC classes and land uses may be appropriate in some FEPs, and is one of the tools available to a CFEP. However, my concern is that it is too inflexible to require every farm to undertake a LUC map

and to then match their land use to that (and the cost of this exercise is unlikely to be justified on every farm).

Focus of FEPs on practices

3.32 Mr Willis for Fonterra has proposed something slightly different for Schedule 1 (Attachment A, starting at page 15 of his Block 3 evidence). He has deleted the objectives and GFP principles and replaced them with a list of practices for each management area. Mr Willis also proposes that Schedule 1 as he has amended it applies to all farming activities, not just permitted activities.

3.33 I have some concerns with the practices proposed by Mr Willis in the context of the tailored FEPs that are contemplated by a resource consent application. In my view, the CFEP ought to be able to exercise greater judgment to tailor the practices to the particular farm as part of a resource consent. To allow for that, I consider that the tailored and non-tailed FEP schedules should be kept separate.

3.34 I also have some concerns about the details of the practices proposed by Mr Willis (relying on Mr Richard Allen's evidence), particularly the more specific standards such as a requirement that no cattle older than 2 years are grazed on forage crops on LUC class 6e, 7 or 8 land. It is not clear what Mr Allen has based his standards on (some appear to be based on industry standards but for others, like this one, its origin is not clear).

3.35 I am concerned about the potential ability for Council to implement such a specific standard e.g. how will a Council officer determine that cattle are over 2 years old or that land is LUC class 6e, 7 or 8 (the situation I am concerned about is one where LUC land is incorrectly mapped). I am concerned that sometimes when we attempt to adopt greater specificity and certainty, we inadvertently create greater uncertainty or unintended fish hooks. (To be clear I do not consider it appropriate to forage crop on steep slopes where excessive soil loss is likely to result but I do consider that identification of this risk and appropriate management protocols should be developed within a FEP).

3.36 Even if specific practices like this were appropriate in a permitted activity FEP, I have concerns about the implementation and potential loss of flexibility if this is rolled out to all farms.

3.37 By way of example, I have concerns about how this might apply to dairy grazers and other drystock farmers on class 6 land during the winter. Based on Mr Burt's Block 1 evidence for Beef + Lamb (Table 1, page 28), there are drystock farmers that are doing this. In particular, Mr Burt's table shows that the average Farm Class 3 (North Island Hard Hill Country) farm has 10 dairy cattle and the average Farm Class 4 (North Island Hill Country) farm has 66 dairy cattle. This will be dairy grazers on class 6 or steeper land.

3.38 While I understand that Mr Willis' proposal is to provide a pathway for farmers to obtain a controlled activity consent for the particular practice they cannot comply with, I am concerned that this could apply to many of the practices (i.e. farmers could find themselves complying with very little of Schedule 1 and needing consent for changes to many standards). I also reiterate my views above that this type of approach ought to provide for "the norm", with only exceptions departing from prescribed practices or standards.

GFP practices in document outside PC1

3.39 A further variation in the approach to providing greater specificity to Schedule 1 is set out in Mr Gasquoine's evidence for WRC as proponent.

3.40 At paragraph 8 of his evidence, Mr Gasquoine refers to a document containing GFP practices for each of the five objectives in Schedule 1 (attached as an appendix to his evidence) but he does not state how it is proposed to be used. He does not appear to be stating that it should be included in Schedule 1 and my view is that it may be appropriate to include this in the "FEP review guide" or guidance document contemplated by Mr Dragten in his report on FEPs.[4] Such an approach would recognise Mr Gasquoine's comments that the "list is not exhaustive" but is intended to guide or assist CFEPs and would provide for the opportunity for it to evolve over time.

3.41 In respect of all of the above, I reiterate my views in my Block 3 evidence that the issues with Schedule 1 and minimum standards could benefit from specific and targeted expert conferencing.

[4] See bottom of page 63 and start of page 64 of Block 3 section 42A report.

NRP and Overseer

3.42 At paragraph 25 of his evidence, Mr Edlin for WRC as submitter, states that GFP does not require a farm to operate at or below a certain N loss limit and therefore he is concerned that GFP will not necessarily prevent increases in N loss from intensification of land use. I agree with Mr Edlin that GFP principles on their own are not likely to prevent net intensification (except that any increases in N loss would need to meet efficiency considerations). However, Schedule 1 does propose a GFP principle, which requires farms to ensure N losses do not exceed the NRP or to reduce to the 75th percentile where that is exceeded.

3.43 In my view, the NRP (and associated principle in Schedule 1) addresses Mr Edlin's concerns about intensification. However, the issue that arises is how the NRP is to be complied with.

Compliance with NRP

3.44 The issues with using Overseer in a regulatory context are well documented. Mr Dragten's report proposes that these issues are managed through the confidence assessment by CFEPs during reviews of compliance with FEPs.[5] He has developed a pragmatic proposal that considers the potential use of a variety of tools or metrics, which could include Overseer, to assess the confidence that a farm is not exceeding its NRP.

3.45 At paragraphs 13 and 14 of his evidence, Mr Lynch for WRC as submitter, raises concerns that Overseer is not a "sound basis for rule compliance" and an input based condition of a rule or resource consent would potentially be more appropriate from a compliance perspective. As identified in Mr Dragten's report, input controls are likely to be cumbersome and inflexible in the context of the PC1 catchment (including the variability in land form and land use and climate that occurs in the catchment).[6]

[5] Block 3 section 42A report at page 66.
[6] Block 3 section 42A report at page 65.

3.46 There is also an issue in that Overseer inputs are only assessed as being appropriate for a particular farm (i.e. as meeting the NRP) after they are put into Overseer and the model confirms that the farm complies with the NRP i.e. the Overseer modelling process identifies the inputs, and it is impossible to distance the two. Overseer version changes occur as a result of updates to science and modelling methodology. Therefore, from time to time any particular farm's nitrogen loss may change (through no change to the farm system). That may indicate that some inputs become less appropriate for determining nitrogen while others become more appropriate. However, the only way to test them is to put them through the model. Accordingly, the relevance of the input assumptions is only maintained through use of the Overseer model.

3.47 My reading of Mr Dragten's report is that he is proposing a pragmatic response to these issues. I understand that he proposes that if, following confidence assessments and reviews, the NRP is not being compiled with, then input limits are inserted into resource consents through section 127 consent condition reviews.[7] There will potentially be issues with Mr Dragten's proposal, but there does not appear to be a more appropriate response and this appears to be the nature of the issues we are dealing with (they are grey, not black and white).

Permitted vs consented activities

3.48 At paragraphs 19 to 21 of his evidence, Mr Lynch expresses his view that a consent regime is preferable to a permitted activity regime because under a permitted activity regime there is generally no requirement to deal with the regulator. While that may be the case with traditional permitted activities, my understanding of the FEP regime under PC1 is that it will be quite different with farmers having to prepare FEPs as permitted activities under a CIS, for example. This will involve registering the farm with WRC, preparing and lodging a NRP, preparing and lodging a FEP and ongoing reviews and grading of the FEP.

[7] Block 3 section 42A report at page 65.

3.49 While the CIS might be the interface between WRC and farmers for most (if not all) of this, there is still the high level of engagement with regulatory oversight. In addition, I refer to the benefits of the CIS regime, including financial and supply pressures to comply with the FEP and any permitted activity rules,[8] that are not otherwise present in a traditional permitted or consented activity regime.

Submission of NRP

3.50 At paragraph 37 of his evidence, Mr Lowe for the Waikato and Waipa River Iwi proposes that NRPs are submitted by farmers at 3 to 10 year intervals, depending on how their NRP sits in the dairy NRP distribution curve for the FMU. I do not agree with that proposal and I support Mr Dragten's proposal that farmers effectively obtain an NRP as a one off exercise and are not required to keep that updated unless they are assessed by a CFEP as having a low level of confidence.

3.51 For the reasons explained above, I have concerns about use of Overseer to regulate farm compliance with the NRP. In my view, the provision of the NRP at the start of this process will be sufficient to enhance our understanding of the Catchment and spatial distribution of N loss. There may be changes over time, but this is not a case of nitrogen allocation where catchment accounting and precision would be required.

3.52 I also note that the focus is solely on N and not on the other contaminants. I understand that the purpose of Table 3.11-1 is to provide a benchmark against which to assess progress on all four contaminants in the next ten years, without allocation to a sub-catchment or property scale and without solely focusing on nitrogen.

Nitrogen Risk Scorecard and nitrogen surplus

3.53 At paragraphs 5.1 to 5.4 of his evidence, Mr Richard Allen states that Fonterra considers that the Nitrogen Risk Scorecard should be included in all FEPs and

[8] I explain this at paragraphs 3.60 to 3.63 of my Block 3 evidence.

also proposes that a "purchased nitrogen surplus" number is included in all FEPs.

3.54 These metrics could be useful ways of demonstrating whether a farm has remained within its NRP without the need to calculate an NRP to demonstrate compliance. They could be used as part of the tools proposed for the CFEP assessing a "level of confidence" as proposed by Mr Dragten.

3.55 My reservations with the use of the scorecard include that the nitrogen risk scorecard was developed for dairy farms. It is not clear to me that it will be directly applicable to drystock farms and I consider that flexibility ought to be provided to adapt and develop this (and this could be achieved as part of Mr Dragten's level of confidence proposal). I also have concerns about the use of nitrogen surplus as it is still reliant on Overseer. Mr Allen's proposal for purchased N surplus might avoid this need but it needs to be borne in mind that for many farms this may only one portion of a farm's nitrogen balance.

3.56 Accordingly, I think that they are useful tools that could be used to assess confidence that the NRP has not been exceeded. However, in my view it should not be compulsory for all farms to have to do this.

Nitrogen use efficiency and minimise

3.57 I do not agree with Ms Jordan's views on nutrient use efficiency, explained at paragraph 49 of her Block 3 evidence. This is in the context of Objective 2 of the section 42A changes to Schedule 1.

3.58 As explained in my Block 3 evidence, Objective 2 was one of the only places where I did not take issue with the use of the word "minimise" because it was being considered in the context of resource use efficiency. In my view, the focus of this objective ought to not be on minimising nutrient losses to the smallest level possible (or, as Ms Jordan states, maximising the reductions required). In my view, the farm is required to maintain its NRP and this objective provides for or focuses the FEP on finding nitrogen efficiency, for example. This would mean that nitrogen reductions would be required, where efficient, but would not mean (as Ms Jordan appears to require, but with which I disagree) nitrogen losses to be reduced to the smallest extent possible.

Table 3.11

3.59 At page 26 of her evidence (in her track changes to Schedule 1), Ms Marr proposes a definition for “minimise” that is linked with Table 3.11-1 (and then carries these changes through to the matters to be contained in an FEP).

3.60 I set out my concerns about the use of the term “minimise” in my Block 3 evidence. Ms Marr appears to be proposing to link this term with Table 3.11-1 to provide context for the level of reductions needed. I do not consider this appropriate and my view remains as set out in my Block 3 evidence i.e. remove the word “minimise” and provide a purpose section for an FEP with reference to the parameters proposed by Mr Eccles in his amendments.

3.61 My understanding of Table 3.11-1 is that it is not intended to used as a basis for allocating contaminants to a sub-catchment or property level. My understanding is that the Catchment is not well understood and there is a need for more monitoring, information and science (particularly regarding factors such as attenuation). The focus of this plan change is on making progress via 10% improvement, while at the same time improving the understanding of the Catchment so that allocation is an issue that can be considered in 10 years time.

3.62 From a farm planning perspective, it is difficult to see how a CFEP could apply a requirement to identify the reduction in contaminants on an individual property required to achieve the water quality states and goals in Table 3.11-1 (as proposed by Ms Marr’s additional paragraph 2A to Schedule 1).

3.63 The short term targets and distance from them is a factor that could be weighed in the decision making. This is what Mr Eccles proposed in his amendments to Schedule 1, through the consideration of Catchment Profiles (which I understand will contain other information such as the Jacobs pie charts showing sector contributions to particular contaminants in each sub-catchment). However, this is a qualitative assessment and I do not see how Table 3.11-1 could be applied by a CFEP in a quantitative assessment, given difficulties in disaggregating sub-catchment discharges to a particular property and issues such as attenuation.

3.64 Thinking about this issue from the perspective of actions a farmer can take on farm to control contaminants, at this stage, it is not clear to me how an individual farmer could consider sub-catchment outcomes or be held responsible for them.

Commercial vegetable growing

3.65 I have reviewed the evidence of Mr Barber for Horticulture New Zealand. At paragraph 35 he describes a project the commercial vegetable industry has developed to address sediment loss from commercial vegetable production ("CVP") land. This project has led to the development of an ''app'' whereby growers can compare erosion rates under different management regimes.

3.66 At para 43 he provides an example of a lookup table developed from the app that describes the various efficiencies of different management regimes. Of note is the potential to reduce sediment loss from CVP land by 99%. In my opinion this is an excellent example of a sector being self-organised and developing a set of quantifiable practices to support improved environmental performance as opposed to defaulting to unquantified minimum setback distances that are not directly related to the issue in context.

3.67 I agree with Mr Eccles' comments at paragraph 5.2 of his Block 3 rebuttal evidence, that what is important is that the rule framework is workable for those on CVP land and achieves equity or consistency in approach.

4. RESPONSE TO WRC MEMORANDUM

4.1 In this section of my evidence, I set out my response to the following matters raised in the WRC Memorandum dated 5 July 2019:

a. Slope

b. Stocking rate

c. Underdeveloped Maori land

Slope

4.2 Paragraphs 48 to 51 of the WRC memorandum explain the officers' views that slope ought to be measured using an inclinometer until suitable LiDAR data is

available. They propose a new definition for slope at paragraph 51. It appears that the definition would apply to slope restrictions that are proposed for cultivation and grazing activities (however, the section 42A report has not specified what these might be e.g. no grazing above 25 degrees?) and to slope exceptions to the stock exclusion rule (again, no number is specified for slope at this stage).

4.3 By itself, the proposed definition seems to be a pragmatic approach for defining slope in the absence of LiDAR data. However, I have concerns about the practical effects if this definition is coupled with rules about grazing, cultivation and stock exclusion above certain slopes. For example, if the rules require no cultivation above 25 degrees, the practical effect of the definition would be that every 20m section of land would require a specific assessment and if parts of a paddock exceed this slope, and are cultivated, a farmer could be liable for prosecution.

4.4 Taking stock exclusion as another example, my assessment of the definition of slope is that if the stock exclusion rules excluded land above 25 degrees, the practical effect of this definition would be that parts of streams would be fenced but not others, and it is not clear whether every slope in a paddock would need to be assessed or whether only slopes leading to the stream would be assessed or how much of the paddock would need to be above that slope for the slope exception to apply.

4.5 These examples are further illustrations of the concerns I raise above about unintended consequences of attempting to provide greater specificity (in this case, greater specificity about how slope is measured).

4.6 In Tukituki Plan Change 6, the stock exclusion rules are based on slope and stock units. Stock exclusion is mandatory on slopes up to 15 degrees and above that, it is required where the stocking rate exceed 18 stock units. I was involved in the development of this rule for Hawkes Bay Regional Council and it was developed in consultation with industry.

4.7 Our thinking at the time was that a slope criterion would be less subjective than an LUC based measure. However, in practice we have found that slope is difficult to assess with many confounding variables in a paddock, such as

whether the slope runs towards the stream, whether it is just the slope of the stream bank or whether it is the flat or one terrace in a flat paddock that are assessed, how much of the paddock needs to be above 15 degrees etc.

4.8 In terms of the justification for 18 stock units, this is the figure that has been used in the Auckland Unitary Plan and Tukituki Plan Change 6 stock exclusion provisions. Eighteen stock units is the equivalent to 2.7 drystock cows or 2.25 dairy cows (based on a 450kg cow producing 350kgMS, (see **Annexure IFMR1**). This is based on a per ha, per paddock, instantaneous stocking rate. In my opinion, 18 stock units per hectare is an effective threshold as it will catch mob stocking of large animals for both dairy and drystock operations. These are the higher risk activities that typically lead to the erosion, sediment and E coli discharges or effects that can be managed (and reduced) through stock exclusion.

4.9 From a compliance perspective, my view is that basing stock exclusion solely on a stocking rate is more certain, measurable and observable. For example, if a compliance officer visits a farm and observes a cow in a stream, he/she can easily count the number of cows in a paddock, convert that to a stock unit, measure the size of the paddock and identify whether the rule has been breached. In contrast, if he/she was to rely on a slope assessment that would likely involve various subjective assessments that would be provide grounds to challenge enforcement action, if prosecution followed.

4.10 Accordingly, I support Federated Farmers' proposal for stock exclusion to be based on stock units.

4.11 In respect of cultivation and grazing, I consider that assessment of hotspots and critical source areas through a tailored FEP is a more pragmatic approach to responding to the issues associated with slope, erosion, soil compaction and run off. It also addresses the similar compliance issues that would arise from trying to enforce a rule or standard that prevented cultivation or grazing above a certain slope.

4.12 A related issue that has been raised by the Hearing Panel is what the stock unit test ought to be for erosion purposes. This might be a better way to approach grazing activities on erosion prone land, as opposed to relying on a

crude slope exclusion. In my opinion, it is more appropriate to manage erosion from grazing through a monitoring framework developed through a tailored FEP where the actions can be tailored and effects or results are monitored. As an example this might involve a soil compaction monitoring program to monitor the effect of heavy cattle on hills or a groundcover assessment in areas where geology and climate increase susceptibility to overgrazing and loss of pasture cover. The relationship between grazing,slope and erosion susceptibility is variable and best identified and managed within a FEP.

Stocking rate

4.13 At paragraphs 74 to 90, the officers set out their proposal for the definition of stocking rate. They recommend that stocking rate is defined as stock units per hectare averaged for the year and for the property. In my view, the appropriate metric will depend on the purpose.

4.14 For example, if stocking rate is used for an exception to stock exclusion requirements, it ought to be defined as a per hectare instantaneous rate within a paddock. This will ensure that the stock exclusion requirement is tied to the effect i.e. higher stock numbers in a paddock means higher risk if stock enter the stream.

4.15 Alternatively, if stocking rate is used as a threshold for the low intensity permitted activity rule 3.11.5.2, it may be more appropriate to adopt an average across the year as proposed by the reporting officers at paragraph 90. An important aspect of this type of assessment is that it will need to be able to accommodate seasonal variation in stock class and condition. I have attached in **Annexure IFMR2** the Lincoln University Technical Budget Manuals stock unit assessment tables to illustrate the significant variation that occurs within and between stock classes.

Underdeveloped Maori land

4.16 Paragraphs 114 and 115 set out the reporting officers' analysis of what percentage of Maori land is underdeveloped. The officers conclude that 78% of Maori land in LUC classes 1 to 4 that is in drystock, forestry or other land uses is underdeveloped. The proposition is that land in LUC classes 1 to 4 that is horticulture, dairy or lifestyle is developed. I agree that these latter three

land uses will likely have the highest land value, but I do not agree that that leads to a conclusion that any LUC class 1 to 4 land used for another purpose is not developed or is underdeveloped.

4.17 I have read Dr le Miere's analysis of paragraphs 114 and 115, and wish to make some comments from my perspective as a farm systems and land management expert.

4.18 Forested land has recently experienced an increase in capital value. This does not mean that this land is any more or less developed than it previously was, it just means that its monetary value has increased. This increase has come about as a consequence of the value of carbon credits significantly increasing in recent times, and the perception that they will continue to increase.

4.19 Any assessment of development is inherently subjective. The analysis by WRC has not taken into account restrictions on development. In my view, the restrictions on development are relevant (and would be taken into account in assessing the capital value of that land i.e. its highest and best use). If land is not able to be developed (i.e. changed to another land use), that would suggest that the current land use is its developed state.

4.20 The types of development restrictions that have not been considered include:

a. The cost of obtaining carbon credits (if the land is currently in forestry).

b. Any SNAs over the land (which would be district plan restrictions on development of bush and scrub).

c. Any water allocation requirements (I understand the Upper Waikato to be over allocated for water and this would restrict the ability to convert to dairy or horticulture).

d. Other district zoning restrictions (that would restrict subdivision of land for lifestyle blocks, for example).

e. Anything else impacting on the ability to develop the land, such as the ability to obtain finance or governance structure arrangements for decision making (both of which I understand to be issues associated with multiple owned Maori land).

4.21 Accordingly, I consider that the conclusion that 78% of Maori land is underdeveloped, or could be developed, ought to be approached with caution. It may be that when restrictions on development (or land use change) are considered, this land is more appropriately described as developed or utilised.

I F Millner

Annexure IFMR1

Table 1.74: **Stock Unit Measurements for Sheep, Cattle and Deer (including young stock)**

Ewe (see *Table 1.72*)	-
Wether	0.7
Ram	1.0
Hogget 30 kg, slow growth rate	0.7
40 kg, medium growth rate	1.0
50 kg, rapid growth rate (pre-winter hogget weights)	1.2
Beef cow* 350 kg, 68 % calves weaned	3.7
400 kg, 83 % calves weaned	4.4
450 kg, 88 % calves weaned	5.3
500 kg, 90 % calves weaned	6.3
Beef weaners* 135 - 270 kg	3.5
Beef*, 200 - 400 kg, slow growing	3.7
200 - 465 kg, rapid growing	4.6
350 - 500 kg	4.7
Bull* 500 kg	6.0
Jersey yearling 0 - 12 months	1.7
Friesian yearling 0 - 12 months	1.9
Jersey heifer	3.0
Friesian heifer	3.4
Red deer* - Weaning to 15 months - Males	1.4
- Females	1.2
- 15 to 27 months - Males	1.8
- Females	1.8
- Adults - Males	2.1
- Females	1.9
Wapiti* - add 0.1 to red deer values	
Fallow deer - Weaner buck	0.55
- Yearling buck	0.65
- Yearling doe	0.55
- Mature doe	0.9

Source: Farm Technical Manual, Lincoln University

Annexure IFMR2

***Table 1.72*: Stock Unit Measurements for EWES, Based on Ewe Weight and Percent Lambs Weaned** (see *Table 1.74* for other sheep).

Ewe Weight Mating	*Percent Lambs Weaned*								
	70 %	*80 %*	*90 %*	*100 %*	*110%*	*120%*	*130%*	*140 %*	*150 %*
35 kg	0.65	0.70	0.75						
40 kg	0.70	0.75	0.80	0.85	0.90				
45 kg	0.75	0.80	0.85	0.90	0.95				
50 kg	0.80	0.85	0.90	0.95	1.00	1.05	1.10	1.15	
55 kg		0.90	0.95	**1.00**	1.05	1.10	1.15	1.20	1.25
60 kg			1.00	1.05	1.10	1.15	1.20	1.25	1.30
65 kg				1.10	1.15	1.20	1.25	1.30	1.35
70 kg				1.15	1.20	1.25	1.30	1.35	1.40
75 kg				1.20	1.25	1.30	1.35	1.40	1.45

***Table 1.73*: Stock Unit Measurements for DAIRY COWS, Based on Cow Weight and Milksolids Production**

Cow Liveweight	*Milksolids Yield*						
	175 kg	*210 kg*	*245 kg*	*280 kg*	*315 kg*	*350 kg*	*385 kg*
250 kg	4.6	5.1	5.5	6.0	6.4		
300 kg	4.9	5.4	5.8	6.3	6.7	7.2	
350 kg	5.2	5.6	6.1	6.5	7.0	7.4	
400 kg	5.5	5.9	6.4	6.8	7.3	7.7	8.2
450 kg	5.8	6.2	6.7	7.1	7.5	8.0	8.4
500 kg		6.5	6.9	7.4	7.8	8.3	8.7
550 kg			7.2	7.7	8.1	8.6	9.0

Source: Farm Technical Manual, Lincoln University