In the matter of: Clauses 6 and 8 of Schedule 1 – Resource Management Act 1991 – Submissions on publicly notified plan change and variation – Proposed Plan Change 1 and Variation 1 to Waikato Regional Plan – Waikato and Waipa River Catchments

And: **Wairakei Pastoral Ltd**

Submitter

And: **Waikato Regional Council**

Local Authority

STATEMENT OF EVIDENCE OF STUART FORD

Block 3 Hearing Topics

Dated: 5 July 2019

STATEMENT OF EVIDENCE OF STUART FORD

SUMMARY

1 In summary, the five key points made in my Block 3 evidence are:

2 Leaving the detailed entry/exit arrangements for industry/sector scheme governance documents is preferable because this approach is more "enabling" and allows for some flexibility and innovation in how they are set up to meet the needs of particular communities or industry or sector groups. The same considerations will also apply to enterprise and sub-catchment consents.

3 Adaptive management coupled with appropriate mitigation approaches are an important part of achieving the water quality objectives that are set in Table 3.11-1. By including them in Schedule 1 and the PC1 rules ensures that they are part of the management framework of how landowners are able to change their management of the four contaminants over time and achieve the water quality objectives much more effectively.

4 My economic analysis indicates that in terms of effectiveness in achieving the desired outcomes and the measure of economic efficiency, the amendments proposed by Mr McKay are a far superior option than PC 1 as proposed.

5 In terms of providing for economic growth and employment opportunities and therefore maximising the wellbeing of the community, the amendments recommended by Mr McKay are a much more attractive option than that offered by PC1.

6 It is my opinion that the amendments proposed by Mr McKay in total will result in a far superior outcome for PC1 (based on my practical knowledge of how effective FEP schemes work) and from an economic assessment of the effectiveness and efficiency than that proposed under PC1 as notified.

BLOCK 3 HEARING TOPICS

1. BACKGROUND

1 My name is **Stuart John Ford**. I have the qualifications and experience recorded in my statement of evidence filed in relation to the Block 1 Hearing Topics.

2 My statement of evidence has been prepared in accordance with the Code of Conduct for Expert Witnesses set out in Section 7 of the Environment Court of New Zealand Practice Note 2014.

2. MAKING REDUCTIONS IN DIFFUSE DISCHARGES VIA CATCHMENT WIDE RULES AND THE NRP

3 Objectives 1 and 3 are implemented by the provisions in Waikato Regional Plan Change 1 – Waikato and Waipa River Catchments (**PC1**) regarding the short-term (2016-2026) and the transition to the 80-year goal. As noted in my Block 1 evidence, the PC1 objectives as amended by Mr McKay are in my opinion suitable for achieving sustainable management. My Block 3 evidence for Wairakei Pastoral Ltd (**WPL**) focuses on whether the PC1 provisions relating to farming activities will be efficient and effective.

TOPIC C3. CERTIFIED INDUSTRY SCHEMES

4 It is my opinion the proposed Industry/Sector Schemes will operate very much like the community irrigation schemes in the South Island in that they will hold a central consent or consents. The irrigation schemes are charged with managing the environmental performance of their members against the requirements of that consent including any subsequent changes that are deemed to be necessary to achieve the water quality standards that are set.

5 Myself and my five environmental staff at The AgriBusiness Group have been involved in consulting in relation to environmental performance, preparing Farm Environment Plans (**FEP's**) and auditing FEP's for all of the major irrigation schemes in Canterbury as shown in **Table 1.** In total they represent approximately 275,000 ha of irrigation capability and a much wider area of total land involved. The properties themselves range from the relatively small, 30 ha, up to the large, 2,000 ha plus, with the full range of farming activities and types represented.

Table 1: Canterbury Community Irrigation Schemes which The AgriBusiness Group has dealt with in achieving their environmental aims through the use of FEP's

Scheme Name	**Irrigation Area (Ha)**
Amuri Irrigation Company	28,000
Waimkarariri Irrigation Limited	23,000
Central Plains Water Limited	60,000
Rangitata Diversion Race Limited	94,486
Barrhill Chertsey Irrigation Limited	21,500
Rangitata South Irrigation	16,000
Morven Glenavy Ikawai Irrigation Company	28,000
Benmore Irrigation Company	4,008
Total	274,994

6 It is my opinion that the environmental performance of the scheme members on average would far exceed the environmental performance of non scheme members purely because they have the staff of the schemes managing and regularly updating their FEP's and getting them audited regularly. Many of the schemes are achieving their longer term targets in relatively short time frames well ahead of what they are consented to do.

7 Although all of the schemes I have included are irrigation schemes there has been an increasing demand for non-irrigated land to be included in the various schemes governance network. This has generally been as a result of the fact that the schemes have a very well defined and managed method for efficiently meeting environmental requirements and the ongoing auditing of them via FEP's. This is a very attractive option for the farmers (scheme members) to be able to fold the management of their environmental systems into the operation of an organisation that is highly capable and very professional in the way that they manage this responsibility.

8 This has created demand for entry into the irrigation schemes by people who wish to take advantage of the positive benefits. Not all schemes have been willing to accept new members because servicing their current members requirements has them stretched in terms of current capability, but some have willingly accepted new non irrigated land into their management systems. One of these

schemes is the Central Plains Water Limited which refers to them as “bolt on’s”.

9 I am personally not aware of anyone being required to exit a scheme but no doubt there have been some. In searching through a range of scheme’s commercial agreements in order to determine the status of exiting members I have come to the conclusion that in all cases an exiting member would be required to apply for their own independent consent under the relevant plan rules. There is nothing in any of the agreements that would allow an exiting member of a scheme to maintain their current consenting rights under the scheme once they have exited.

10 I would conclude that leaving the detailed entry/exit arrangements for scheme governance documents is preferable to pre-determining a fixed arrangement in the PC1 provisions, because this approach is more “enabling” and allows for some flexibility and innovation in how they are set up to meet the needs of particular communities or industry or sector groups (the same will apply for sub-catchment consents). The key message that any landowner wishing to exit an industry or sector scheme would need to apply for their own independent consent under the PC1 rules could be addressed very simply by an advice note in PC1.

11 In regards to what would be required in the wording of Schedule 2 to allow the approval or consenting of industry or sector schemes, it is my opinion that the recently announced changes to the Dairy Industry Restructuring Act 2001, as a result of the recent review of that Act (see Appendix 2 **attached** to my Block 3 evidence), give very good guidance for what is required. The changes were announced as a means to ensure that better management of on farm performance was possible.

12 The following changes are recommended:

12.1 Retain the open entry and exit provisions;

12.2 Allow industry or sector scheme managers (e.g. Fonterra Miraka) to refuse milk supply from farmers in circumstances where milk is not compliant or unlikely to comply with the scheme’s terms and standards of supply or is supplied from newly converted dairy farms;

12.3 Clarify that the scheme’s terms of supply can relate to, and price differentiate on the basis of, various on-farm performance matters, including environmental, animal welfare, climate change and other sustainability standards.

13 It is my opinion that the points regarding entry and exit provisions, refusing supply from non-compliant farms, and that terms of supply

can include environmental and sustainability standards, fit quite well with what Waikato Regional Council is seeking to achieve by providing for such schemes under PC1. It is also my opinion that these are internal constitution matters for industry/sector scheme managers to deliver on in terms of meeting PC1 "social licence to operate" requirements. The three points noted above inform what Schedule 2 should say about these matters and could be included in PC1 in that way.

14 For new pastoral conversions or changes in scheme membership the real issues in my view are whether:

14.1 Existing farming properties can comply with their Nitrogen Reference Point (**NRP**) or NRP based consent condition when expanding; and

14.2 That farming activities on vulnerable land are appropriately assessed using adaptive management and mitigation approaches.

15 I deal with these issues in Topic 9 below.

TOPIC C7. COMMERCIAL VEGETABLE PRODUCTION

16 These provisions do not affect WPL. I have however addressed them in my Block 3 evidence for HortNZ that evaluates what amendments are necessary to these provisions from an agricultural and resource economics perspective. There is in my view no inconsistency between the farming and commercial vegetable production provisions in PC1 and both sets of amendments can easily be accepted.

TOPIC C9. FARM ENVIRONMENT PLANS

17 In his evidence to you Mr McKay has recommended amendments to Schedule 1 in the notified version of PC1. From my perspective the changes that are recommended by Mr McKay provide for the transition from current farming practice through good farm practice to best farm practice. Although the time frame for PC1 is relatively short (2016-2026) it is my opinion that it is worthwhile to allow for the transition to occur because there are many land owners who wish to get to best farm practice as soon as it is possible and therefore establishing a pathway for them to achieve that aim is very worthwhile. Providing a mechanism for this transition to work will also achieve the freshwater objectives in Table 3.11-1 in a much shorter time frame than is currently envisaged in PC1 at present.

18 It is also my opinion that the recommended amendments to Schedule 1, as presented by Mr McKay, will contribute to achieving

a real and positive start to achieving the short-term (2016-2026) freshwater objectives across all of the properties and enterprises within the catchment.

19 I would now like to discuss some of the key elements of the proposed amendments that I think offer a significant improvement in both the way PC1 would work and in the achievement of the freshwater objectives in Table 3.11-1.

20 My opinions expressed in this discussion are based on my experience with FEP's predominantly in Canterbury but also in other jurisdictions. I and my staff at The AgriBusiness Group were very early adopters of the use of FEP's that began with the development of an FEP template, the first developed in Canterbury, for the Morven Glenavy Irrigation Company approximately ten years ago. Our involvement has continued to the current time where I have five staff who are all involved in the ongoing development of individual FEP's and who are also certified auditors (including one who is a Certified Farm Nutrient Advisors (**CFNA**) by WRC) and together we provide contracted audit services to eight irrigation companies across Canterbury.

21 During these years the form of the basic FEP's and the auditing standards have continued to evolve to the present state where they are now a very effective means of achieving sustainable environmental gains. As I have already pointed out many of the large scale irrigation schemes through the efficient management of their members FEP's have made substantial progress towards achieving their long term targets well ahead of the time scales that have been set for them. The requirements for FEP's (including Good Farming Practice (**GFP**)) included in the PC1 provisions need to be clear to all plan users but they also need to be generic enough to allow for the on-going evolution which will continue over time.

22 Although many landowners are sometimes apprehensive when they are initially required to produce an FEP, when they have been in the system for a while and have been audited a couple of times they really embrace the concept and strive to achieve an A grade in their audit report. This translates into them achieving the environmental improvements that are set out in their FEP.

23 It is my opinion that the amendments to Schedule 1 proposed by Mr McKay that are key to achieving the outcomes desired of an FEP are:

23.1 A concentration on achieving the required freshwater objectives specified in Table 3.11-1.

23.2 Having an appropriate requirement for a risk assessment that is based on the concept of Vulnerable Land and an appropriate process for identifying Vulnerable Land.

23.3 That the good farming practices and best farming practices are identified and benchmarked.

23.4 Allowing for the use of any appropriate decision support tool (**DST**) in the process of both identifying the areas of Vulnerable Land and testing the effectiveness of various mitigation techniques.

23.5 Including an appropriate adaptive management approach (based on the precautionary principle).

24 In my experience it is very important for an FEP to be focused on an environmental goal or objective. In the case of PC 1 the goal or objective should be achieving the freshwater objectives and any loads/targets set in Table 3.11-1 as opposed to achieving GFP that is currently proposed in PC 1. This is because it should not be part of an FEP to limit the amount of environmental gain that is possible. Some landowners may be able to exceed their FEP goals (by delivering improvements in water quality) at very little cost whilst others may struggle to achieve their goals. So lifting the sights of all in terms of what is possible to be achieved through an FEP is a key element in achieving environmental gains.

25 Mr Conland and Mr Williamson gave evidence in Block 2 about the identification of the Vulnerable Land and particularly high-risk Nitrogen source areas. This was new knowledge to all of us and caused us to rethink exactly how we were able to consider and evaluate the concept of Vulnerable Land and exactly how we can incorporate that assessment into FEP's.

26 This approach has forced us to reframe our traditional approach to identifying the critical source areas on land and has also caused us to reframe how we mitigate the risks that are posed to Vulnerable Land.

27 The amendments to Schedule 1 as proposed by Mr McKay have (in my opinion) successfully incorporated the concept of Vulnerable Land, as we now know it in an appropriate manner. It will enable landowners to be able to carry out an accurate risk assessment of farming activities in their FEP's i.e. avoiding riparian margins and applying adaptive management and mitigation methods to both erosion prone land and high-risk nitrogen source areas.

28 It will also add to the ability of landowners to adopt appropriate mitigations across their properties or enterprises avoiding spending

money on areas where there is little or no risk but concentrating their efforts on those areas that do have significant risks.

29 In some cases the risks identified by this approach may be so great that if they are not able to be mitigated adequately it may result in consent applications being declined. This would force landowners to reconsider the use of the land and force them to consider other forms of mitigation.

30 The way that references to GFP have been included in Schedule 1 as presented in the evidence of Mr McKay, and the way that they have been referenced to external documents is the appropriate way to include them in PC1. It is my opinion that as the community advances through PC1 the way that they are going to impact the river through land use practices will change. Incorporating them in this manner means that Schedule 1 is a "live" document and is not constrained by old thinking about what constitutes GFP as our knowledge changes.

31 Mr McKay recommends that Schedule 1 be amended to allow for any DST to be used. I support this recommendation. In my Block 2 evidence I traversed my reasoning behind my recommendation to allow for any appropriate DST rather than the naming of OVERSEER as the only available option as it stands in PC1 at present due to the uncertainty as to whether any alternative DST would ever be approved by WRC.

32 It is my opinion that as PC 1 is currently drafted we have a very unhealthy focus on OVERSEER as the only named DST. Every other DST is specifically precluded unless it is authorised by the Chief Executive (**CEO**) of WRC and there are no written criteria that could be used by the CEO to make the decision whether to authorise an alternative or not.

33 This is particularly relevant when we consider the fact that for an FEP to be effective it must have carried out a risk assessment, and under the proposed amendments to Schedule 1 as recommended by Mr McKay it must have carried out a Vulnerable Land assessment and traversed a range of mitigations that appropriately address the impacts on the freshwater objectives in Table 3.11-1. In my opinion OVERSEER is wholly unsuited to the task of either risk or land vulnerability assessment or the recommended adaptive management approach.

34 OVERSEER is constructed by blocking of the land in question into land parcels. Once this blocking has been done then land management can be imposed on it but specific stocking rates cannot be modelled for individual blocks. To enable this level of detailed management the land has first to be assessed as to its relative risk or land vulnerability class and then entered in as such.

So OVERSEER is of no real use for this purpose of risk or land vulnerability assessment.

35 OVERSEER only produces leaching rates at the bottom of the root zone or very general estimates of runoff according to the land type class assigned to it. There is absolutely no connection between the losses estimated by OVERSEER and the impact on the freshwater objectives in the river of any activity. So we are unable to use OVERSEER for the adaptive management approach recommended by WPL.

36 It is difficult for me to understand exactly what characteristics OVERSEER has to offer that justifies its elevation to the (only) preferred DST when its capability in this regard is so inadequate. It is my opinion that it is most appropriate to adopt the approach as recommended by Mr McKay.

37 It is also my opinion that including the recommended amendments of Mr McKay in Schedule 1 to allow for the inclusion of a definition of adaptive management should be adopted. Adaptive management at the very least establishes a pathway for the future in terms of establishing the triggers that should be applied and the methods of evaluation and mitigation development that should be enshrined in PC1. In that way PC1 will create a pathway for landowners to move forward and achieve the longer-term goals of PC1.

3. PRIORITISATION AND SUB-CATCHMENT PLANNING

TOPIC C8. SUB-CATCHMENT PLANNING

38 It is my opinion that sub-catchment planning is not an alternative approach to achieving the freshwater objectives in PC 1. Sub-catchment planning is an integral part of PC1 as notified (e.g. Method 3.11.4.5).

39 Therefore I support the amendments suggested by Mr McKay in his Block 2 evidence in regards to Rule 3.11.5.6B to provide for sub-catchment scale consents because it is designed to make sub-catchment planning a natural part of PC1 via an appropriate consent pathway, rather than an alternative entirely voluntary approach.

40 Sub-catchment scale consents will work in a very similar way to industry/sector schemes. That is they will cover a defined geographic area and manage farming activities in accordance with agreed standards set out in Mr McKay's amendments to Schedule 1. They will also have the same kind of governance arrangements that I have described above for industry/sector schemes regarding

such things as entry and exit conditions that will apply to them as set out in Schedule 2 (as amended).

41 I would refer you to my Financial Analysis report (**Appendix 1**) and Scenario 6 that shows the economic and environmental benefits that sub-catchment consents could achieve. This should also be considered in the context of Sub-catchment 66B whereby such gains could enable farming activities via pastoral conversion of 17,776ha of non-Vulnerable Land by retiring farming activities on 776ha of Vulnerable Land.

4. COMMENTS ON SECTION 42A REPORT

42 In Section C2 of the Block 3 Section 42A Report (para 161) the Officers discuss the WPL framework and they conclude "the framework requested is not adequately precautionary". It is my assessment, for the reasons given in this evidence, that the WPL framework is very precautionary in that it integrates an adaptive management technique which is triggered by the performance in the Waikato River catchment and will cause landowners to reanalyse their impacts and to employ alternative mitigation techniques. This approach is far superior to many of the approaches used in other plans and to those in PC1 as notified.

43 At para 556 the Officers state, "it is unclear how changes through subdivision, amalgamation, leases and enterprises themselves are to be addressed." I would just like to point out that exactly the same issues arise with industry/sector schemes and the WRC does not have a problem with them. More importantly, my experience with large scale irrigation schemes in Canterbury (described above) operate in very similar ways to sub-catchment scale consents (proposed by WPL) and the PC1 industry/sector schemes. The critical question is whether such changes result in members or their successors exiting the scheme, or NRP increases as a result of new members entering the scheme. In these cases it is likely that new consents could be required. These matters are best addressed when the scheme is designed rather than via more prescriptive plan provisions.

44 In Section 4.6.4 Analysis (Enterprises) the Officers come to the conclusion at para 569 (based on the analysis in paras 565-568) that "there is limited value or benefit in the concept of "enterprises" and distinguishing these operations from "properties" for the implementation of the policies and rules. Therefore, the Officers recommend that all references to the term "enterprise" are removed from PC1."

45 At para 565 the Officers come to the conclusion that the definition of enterprise includes all properties. It is apparent to me that the Officers are confused about the meaning of the PC1 definitions and I reject the conclusion that they come to based on this analysis.

46 At para 567 the Officers report that mutually exclusive definitions are required for enterprise and property. I agree with this conclusion because PC1 already achieves this as notified. I reject this as a valid reason to remove all references to enterprises in PC1.

47 At para 568 the Officers discuss the fact that some submitters identified concerns with the ownership of the NRP for enterprises, and the ability for N to shift between multiple non-contiguous blocks and/or properties. The Officers agree with these concerns and then escalate them to being "problematic". I would just like to point out that because the PC1 rules have now been changed to land use rules the NRP or the NRP consent condition that reflects it will run with the land by virtue of the relevant land use consent. So far from the concerns being problematic they are just not valid under the revised rules in PC1.

48 Therefore it is my opinion that each one of the analysis points which are used to decide that the term enterprise should be removed from PC1 are just not correct and do not justify the removal of enterprises from PC1. In my view, removing enterprises from PC1 would remove an important streamlining provision (like industry/sector schemes) that reduces the number of consents that will ultimately be required under the PC1 rules. Managing non-contiguous land in multiple ownership at scale will generate efficiencies by enabling landowners collectively through a single joint management structure to make sensible decisions about farming activities that reflects both land vulnerability and the assimilative capacity of water bodies to achieve the freshwater objectives in Table 3.11-1. By managing land holistically at scale an enterprise will be able to achieve these outcomes in a way that could not be achieved by managing the member properties in a disaggregated way.

5. SECTION 32 EVALUATION

49 I support the amendments to the Objectives as recommended by Mr McKay to achieve sustainable management and give effect to the NPS-FM and the Vision and Strategy; the amendments to the Policies as recommended by WPL to implement the Objectives; and the amendments to the Rules to implement the Policies.

50 Without the amendments as recommended by Mr McKay it is my opinion that the Objectives will not be suitable; the Policies will not be effective or efficient; the Rules will not be effective or efficient; and PC1 will not provide opportunities for economic growth and employment or address the precautionary principle.

51 In my Block 1 and 2 evidence I gave evidence about the failure of the Section 32 analysis to either adequately analyse, or consider at all, some of the key cornerstones of PC 1. The effectiveness and efficiency consideration of the impact of PC 1 has not therefore

been adequately considered. The result of this failure is that PC 1 as notified is not the most effective or efficient option open to the WRC, particularly, if it is considered in a balanced way including consideration of the wellbeing of the community in terms of the opportunities for economic growth and employment.

Effectiveness Analysis

52 In this section on effectiveness analysis I will illustrate my point by reference to three key themes of PC 1:

52.1 The use of the NRP and 75th percentile calculation;

52.2 The timeframes for the development of FEP's; and

52.3 The restrictions on land use change.

53 PC1 as notified relies on the 75th percentile calculation as an essential policy element. Those properties and enterprises that are above it have to develop plans to get below it, and those that are below it have to maintain their systems so that they do not exceed the calculated NRP.

54 In my Block 2 evidence (paras 73 to 76) I presented my analysis of the effectiveness of both the NRP calculation and the 75th Percentile and concluded that:

"… in all likelihood the adoption of the 75th percentile N leaching value mechanism will achieve an unknown amount of reduction in N getting into the river, [and] poor effectiveness …"

55 In my evidence for Block 1 (paras 9 to 11) and Block 2 (paras 51 to 55) I discussed the impact of the timeframes for farming properties and enterprises to become consented and concluded that neither the notified Objectives nor the Rules are likely to see a demonstrable change in the freshwater objectives set in Table 3.11-1 during the 2016-2026 timeframe of PC 1.

56 In my Block 2 evidence (paras 88 to 99) I discussed the effectiveness implications of the restrictions on land use change in PC1 and concluded that it will be particularly ineffective because it precludes any land use change on non-vulnerable land that could be carried out in a way that meets the freshwater objectives in Table 3.11-1, and that the restriction on land use change will reduce economic growth and employment opportunities.

Efficiency Analysis

57 My analysis of the relative efficiency of PC 1 is taken from my report of the results of the Ruahuwai Decision Support Tool (**RDST**) titled "Methodology and Results of the RDST Scenario Financial

and Economic Modeling" which I presented in my Block 2 evidence (and is also attached to this evidence as Appendix 1).

58 In this analysis I compare the results of Scenario 4 – FEP and 75th Percentile on all farming properties and enterprises (which represents a 'future' where all farming properties and enterprises in the catchment have prepared and completed a FEP and all farming properties and enterprises are limited to the 75th percentile as proposed under PC1) on the one hand, with Scenario 6 – FEP implementing mitigations on Vulnerable Land which on the other hand represents the result of accepting WPL's amendments to PC1.

59 You should note that in fact Scenario 4 does not accurately reflect the result of PC1 because it assumes that all farms have completed an FEP, when in fact the way PC1 is written at present this will not have occurred at this point in time. So it can be said that Scenario 3 is an over optimistic picture of the true results from PC1.

60 My methodology was to develop an economic model that allowed me to express the performance of the scenarios modelled in the RDST model.

61 In order to compare the efficiency of Scenarios 4 and 6 I compiled them into **Figure 1** that provides a comparison of financial performance.

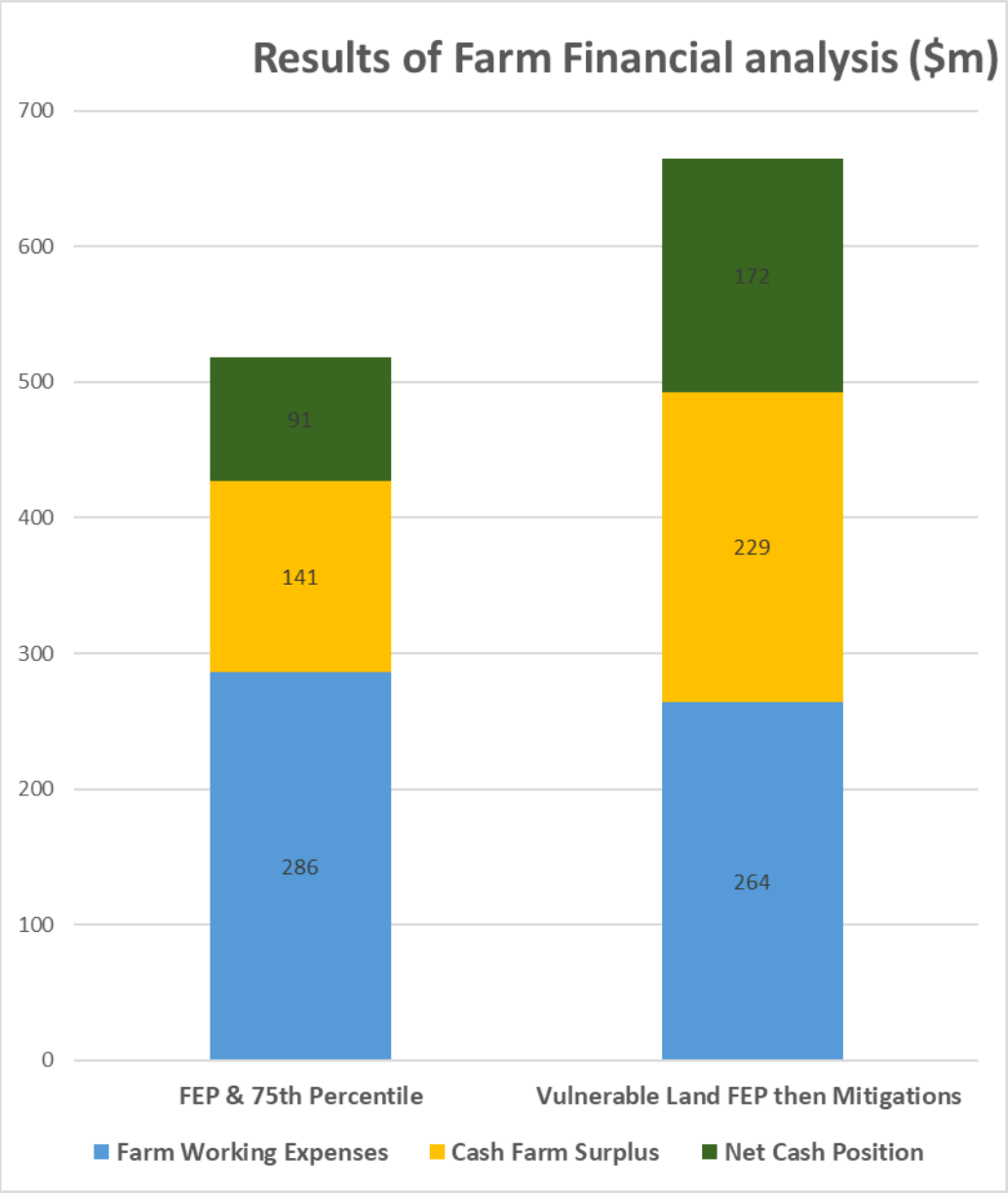


Figure 1: Comparison of the financial performance of PC1 with WPL's amendments

62 What we can take from Figure 1 is that the Net Cash Position (which reports the true profit from the business) for Scenario 6 at $172 million represents a far superior outcome than the Net Cash Position of Scenario 4 at $91 million.

63 So in terms of economic efficiency the amendments proposed by Mr McKay are far superior options than PC 1 as notified.

Flow on Impacts

64 As reported in Appendix 1 "the flow on impacts to the wider economy have been calculated by multiplying the results of the economic modelling by multipliers." The two measures which I report here are:

64.1 Value Added - which reports the gross revenue minus all the costs of production; and

64.2 Employment - which reports the total number of jobs expressed as full time equivalents (FTE).

65 The comparative analyses of PC1 with the amendments recommended by Mr McKay are shown in **Table 2** of my report.

Table 2 : Comparison of the flow on impacts of PC1 with WPL's amendments

	FEP & 75th Percentile	FEP then Mitigations on Vulnerable Land
Value Added $ m	356	400
Employment FTE	776	828

66 In terms of Value Added the amendments that are proposed by Mr McKay which are represented by Scenario 6 offer considerably more value added at $400 million than that offered by PC 1 represented by Scenario 4 at $356 million.

67 In terms of employment the amendments that are proposed by Mr McKay which are represented by Scenario 6 offer more employment at 828 FTE's than that offered by PC 1 represented by Scenario 4 at 776 FTE's.

68 So in terms of providing for economic growth and employment opportunities the amendments recommended by Mr McKay are a much more attractive option than that offered by PC1.

69 I have read the s 32 evaluation table that is included in Mr McKay's evidence and can confirm that the conclusions in my report stand and that from an agricultural and resource economics perspective the amendments and recommendations are appropriate and will be efficient and effective when compared to PC1 as notified (or amended by WRC) which would not be.

70 My analysis has been carried out with the precautionary principle in mind. In considering the precautionary principle I would like to draw your attention to the amendments to the risk assessment in Schedule 1 as proposed by Mr McKay regarding identifying Vulnerable Land and the adaptive management and mitigation approach. In particular, it is my opinion, that the adaptive management approach recommended applies the precautionary principle because if the monitoring of the River's water quality shows that existing farming approach's are not enough it expressly provides the ability to very quickly reanalyse the approach and implement some further mitigation strategies.

71 In some cases the precautionary approach may result in consent being refused where risk is not managed appropriately and the freshwater objectives may not be met.

6. CONCLUSIONS

72 I would conclude that leaving the detailed entry/exit arrangements for industry/sector scheme governance documents is preferable because this approach is more "enabling" and allows for some flexibility and innovation in how they are set up to meet the needs of particular communities or industry or sector groups. The same considerations will also apply to enterprise and sub-catchment consents.

73 Adaptive management coupled with appropriate mitigation approaches are an important part of achieving the water quality objectives that are set in Table 3.11-1. By including them in Schedule 1 and the PC1 rules ensures that they are part of the management framework of how landowners are able to change their management of the four contaminants over time and achieve the water quality objectives much more effectively.

74 It is my opinion that the amendments to Schedule 1 proposed by Mr McKay that are key to achieving the outcomes desired of an FEP are:

74.1 A concentration on achieving the required freshwater objectives specified in Table 3.11-1.

74.2 An appropriate requirement for a risk assessment which is based on the concept of Vulnerable Land and an appropriate process for identifying Vulnerable Land,

74.3 That the good farming practices and best farming practices are identified and benchmarked.

74.4 Allowing for the use of any appropriate DST in the process of identifying the areas of Vulnerable Land, testing the

effectiveness of various mitigation techniques, constructing FEP's, and calculating NRP's.

74.5 Including an appropriate adaptive management approach.

75 Without the amendments as recommended by Mr McKay it is my opinion that the Objectives will not be suitable; the Policies will not be effective or efficient; the Rules will not be effective or efficient; and PC1 will not provide opportunities for economic growth and employment or address the precautionary principle.

76 My economic analysis indicates that in terms of effectiveness in achieving the desired outcomes and the measure of economic efficiency, the amendments proposed by Mr McKay are a far superior option than PC 1 as proposed.

77 In terms of providing for economic growth and employment opportunities and therefore maximising the wellbeing of the community, the amendments recommended by Mr McKay are a much more attractive option than that offered by PC1.

78 It is my opinion that the adaptive management approach which Mr McKay recommends allows for the precautionary principle to be applied because if as a result of the monitoring of the River's water quality it shows that the current approach is not enough then it provides the ability to very quickly reanalyse farming approaches and implement some further mitigation strategies.

79 In conclusion it is my opinion that the amendments proposed by Mr McKay in total will result in a far superior outcome for PC1 (based on my practical knowledge of how effective FEP schemes work) and from an economic assessment of the effectiveness and efficiency than that proposed under PC1 as notified.

Stuart John Ford

The AgriBusiness Group

5 July 2019

APPENDIX 1

The AgriBusiness Group Report (2019)

Methodology and Results of the RDST Scenario Financial and Economic Modelling

Methodology and Results of the RDST Scenario Financial and Economic Modelling

1 Summary

I have developed an economic model that has allowed me to express the performance of the scenarios modelled in the RDST model, as covered in the evidence of Mr Williamson and Mr Conland.

The information provided on the financial and economic evidence should be regarded as indicative rather than actual. A number of assumptions have had to be made during the development of my model. When I am able to replace these assumptions with actual data the quality of the information will improve but I am of the opinion that this will not alter the conclusions that can be gained from my work.

It is my opinion that the financial and economic analysis should form an important part of the decision making. Under the RMA decision making is a balancing act between the environmental, social and the economic elements of the decision. Dr Neale in his evidence has been able to comment on the relative performance of the various scenarios as to their environmental impact in terms of meeting the freshwater objectives in Table 3.11.1. In my evidence I am able to report the relative financial performance of the various scenarios and indicate several flow on impacts that should be considered as part of the social assessment in terms of whether the community in the Waikato Region is able to contribute to their wellbeing.

The financial models as presented report:

- Gross Revenue, which is the total revenue from all sources;
- Farm Working Expenses which report all of the working expenses of the farm;
- Cash Farm Surplus which reports Gross Revenue minus Farm Working Expenses; and
- The Net Cash Position which reports the Cash Farm Surplus minus Interest, Taxation, Drawings, Capital Purchases, Development Expenditure and Principal repayments. Essentially it reports the true profit from the business.

The Gross Revenue figure deteriorates depending on which scenario is considered. For example: with a Farm Environment Plan (FEP) and GFP ($ 451 m); or with a FEP and BFP ($437 m); or with a FEP and 75th Percentile ($444m). Then there is a considerable downward change with a FEP and LUC ($306m); a considerable rise with the Vulnerable Land FEP and mitigations ($490m); and a corresponding drop down with a Vulnerable Land FEP and land use change and mitigations ($371m).

The Net Cash Position figure shows a more extreme difference than the Gross Revenue analysis although it shows a similar pattern. It also deteriorates depending on which scenario is considered. For example: with a FEP and GFP ($ 127 m); with a FEP and BFP ($91 m); with a FEP and the 75th Percentile ($91m); a considerable downward change \ with a FEP and LUC ($53m); a considerable rise with the Vulnerable Land FEP and mitigations ($172m); and a lesser drop down with the Vulnerable Land FEP and land use change and mitigations ($115m).

What can be concluded from the financial analysis from an overall perspective (and from an individual business owners perspective) is that the FEP and GFP scenario is the most preferred of the three options that are relevant to PC 1 as notified.

Of the alternatives offered the Vulnerable Land FEP and mitigations scenario would be the most preferred scenario over the FEP and LUC, or the Vulnerable Land FEP and land use change and mitigations scenarios.

The financial modelling reports the results at the “farm” or property or enterprise gate. Past the farm gate there is a considerable amount of activity which results in a lot of additional economic activity referred to as the flow on impacts. The farm gate results, are referred to as the direct effects, the flow on effects are referred to as the indirect effects and when they are added together they report the total economic effects of the activity.

For this exercise I report three different factors that can be derived with the use of multipliers:

- Gross Output which reports the total gross income generated by the activity.
- Value Added which reports the gross revenue minus all the costs of production.
- Employment which reports the total number of jobs expressed as full time equivalents (FTE).

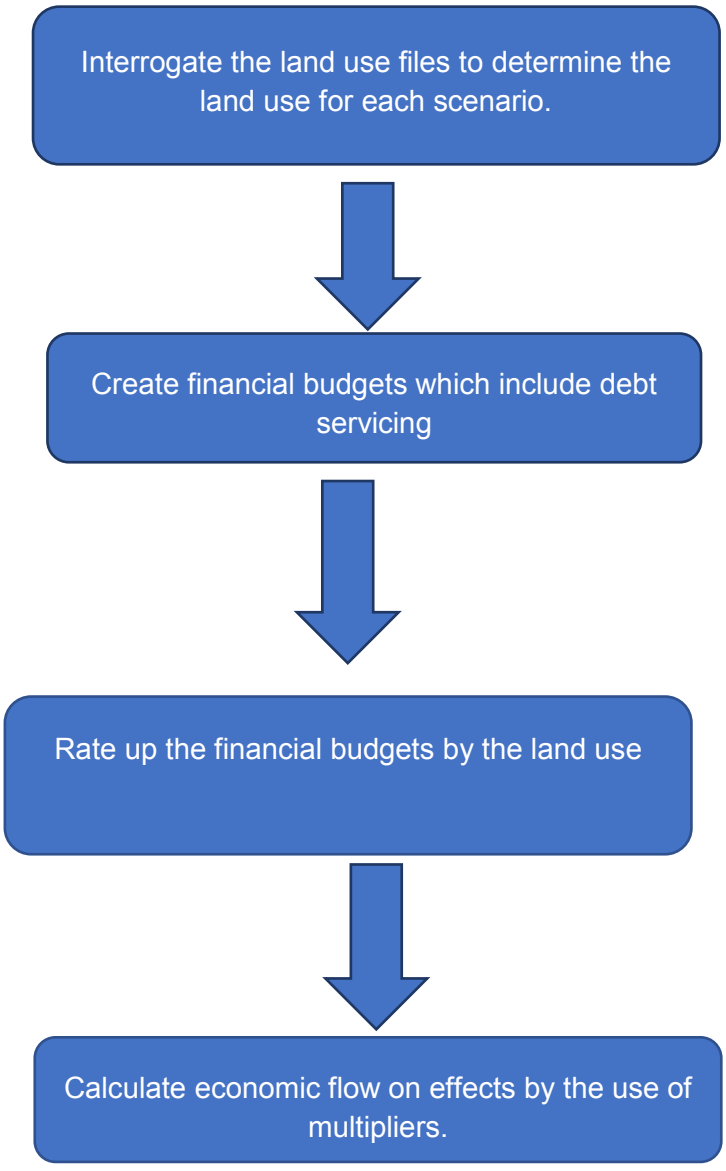
The conclusions that can be drawn from the flow on impact assessment of the scenarios run in the RDST model are:

- The three scenarios which represent PC 1 as notified are all very similar in terms of their flow on impacts. Therefore they would all be considered to contribute equally to the wellbeing of the community.
- The Vulnerable Land FEP and mitigations scenario is the most superior option in terms of the three alternatives of the flow on impacts reported and would be considered to be the preferred option in an economic sense.
- The FEP and LUC is the most inferior option of those tested.

Overall I find that when considering the merits of the range of scenarios presented listing both those proposed under PC1 and the alternatives as suggested by WPL that the Vulnerable Land FEP and mitigations scenario is the most attractive option from both a financial and an economic perspective.

2 Methodology

I have developed an economic model that has allowed me to express the performance of the scenarios modelled in the RDST model, as covered in the evidence of Mr Williamson and Mr Conland. This has entailed the following process:



The information provided in the financial and economic evidence should be regarded as indicative rather than actual. A number of assumptions have been made during the development of my model. When I am able to replace these assumptions with actual data the quality of the information will improve but I am of the opinion that this will not alter the conclusions that can be gained from my work.

It is my opinion that the financial and economic analysis should form an important part of the decision making. Under the RMA decision making is a balancing act between the environmental, social and the economic elements of the decision. Dr Neale in his evidence has been able to comment on the

relative performance of the various RDST scenarios as to their environmental impact in terms of meeting the water quality targets in Table 3.11.1. In my evidence I am able to report the relative financial performance of the various scenarios and indicate several flow on impacts which are able to be considered as part of the social assessment regarding whether the community in the Waikato Region is able to contribute to their wellbeing.

The scenarios that were tested are those described by Mr Conland in his evidence as follows:

Scenario 1 – Do Nothing

This represents a 'future' where the land use as existing at the time of notification (22 October 2016) continues with no mitigations or FEP's developed in the catchment.

Scenario -1 – Stop Farming

This represents a 'future' where all land (except native forest, roads, built, and river land uses) are changed to plantation forest. In this situation geothermal inputs and point sources such as Contact Energy's power station are still included. Inflow from Lake Taupo remains unchanged (e.g. Lake Taupo catchment remains developed).

Scenario 2 – FEP and 'GFP' on all farms

This represents a 'future' where all farms in the catchment prepared and completed a FEP. This is developed following the 5 protocols developed by WPL and GFP as considered determined by OVERSEER protocols (summarised in Mr Ford's evidence). This is consistent with the first 10 year actions considered by Dr Doole (Doole G.J 2016a[i]).

Scenario 3 – FEP and 'BFP' on all farms

This represents a 'future' where the conditions in Scenario 2 exist, except all farms have undertaken significant mitigation steps to "Best Farm Practice" as developed by Mr Ford (in his evidence).

Scenario 4 – FEP and 75th Percentile limits on all farms

This represents a 'future' where the conditions in Scenarios 2 exist, except all farms are limited to the 75th Percentile as proposed in the planning provisions under PC1.

Scenario 5 – FEP then LUC limits applied

This represents a 'future' where the conditions in Scenarios 2 exist, except all the farms are limited to the Land Use Capability limits for productivity as developed by Mr Ford (in his evidence). The land use changes in intensity follow the direction provided by Dr Doole (Doole et al 2016a).

Scenario 6 – FEP then mitigations on Vulnerable Land

This represents a 'future' where farming on Vulnerable Land is avoided and mitigated in proportion to the level of nitrogen risk at the farming location.

Scenario 7 – FEP then mitigations plus land use changes on Vulnerable Land

This represents a 'future' where farming on Vulnerable Land is avoided and mitigated similar to Scenario 6 except on land with very low nitrogen risk. At these locations land use changes in terms of intensity following the direction provided by Dr Doole. (Doole 2016a).

Scenario 1, Do Nothing) and Stop Farming are described by Mr Conland as the bookends of possible action. Scenario 2 (FEP and GFP), 3 (FEP and BFP), 4 (FEP and the 75th Percentile) can all be compared as the PC1 provisions. The alternative scenarios which each represent a different range of on farm changes and costs are Scenario 5 (FEP and LUC), 6 (Vulnerable Land FEP and Mitigations), and 7 (Vulnerable Land and land use change and mitigations) that can be compared with each other and with the PC1 provisions.

2.1 Farm Financial Modeling

The interrogation of the RDST shapefiles was completed for me by Mr Wright from Cardno. The results of his interrogation are shown in Table 1.

Table 1: Land use split gained from interrogating the RDST Shapefiles

	Do Nothing	Stop Farming	FEP & GFP	FEP & BFP	FEP & 75th Percentile	FEP and LUC	FEP and Mitigations on Vulnerable Land	FEP and Mitigations + Land use change
Dairy	43,660	-	45,427	45,427	45,427	9,031	45,427	27,013
Dairy_Support	16,494	-	15,386	15,386	15,386	97,556	15,386	36,664
Dairy_Irrigated	2,078	-	2,078	2,078	2,078	-	2,078	4,588
Sheep_and_Beef	19,774	-	19,774	19,774	19,774	44,277	19,774	23,452
Lucerne_Cropping	3,848	-	4,180	4,180	4,180	-	4,180	4,721
Native_Forest	13,244	13,244	13,563	13,563	13,563	-	13,563	33,623
Forestry	51,873	141,194	50,572	50,572	50,572	116	50,572	20,919
Water	1,841	1,841	1,841	1,841	1,841	1,841	1,841	1,841
Built	3,136	3,136	3,121	3,121	3,121	3,121	3,121	3,121
Lifestyle	3,468	-	3,473	3,473	3,473	3,473	3,473	3,473

As can be seen from Table 1 for the majority of the scenarios are based on the 2018 land use data. The Do Nothing scenario is based on the 2016/17 land use mix but the major differences are between the Stop Farming, FEP and LUC, and Vulnerable Land FEP and land use change and mitigations, where the land use mix changes considerably.

Mr Conland has described the mechanisms which drove the land use change assumptions in his evidence.

My financial models were first developed to match the OVERSEER files to enable a comparison with the APSIM modelling which was carried out to inform the RDST model, they are therefore a representation of the direct land uses that have been modelled. They were then adjusted to match the land uses described in Table 1 and constitute the present land use.

The financial models were then adjusted to represent the changes that were made to the various OVERSEER land use models as described in the nitrogen mitigation modelling report[1] (which is attached to this evidence as Appendix 3) which tested the range of mitigations possible and classified them as Low, Medium and High mitigations. An organic model which was also developed to represent the financial performance that was modelled across a range of the scenarios.

Some of these adjustments entailed changes to production parameters, some made changes to expenditure, and some entailed new capital expenditure. Where the farming property undertook capital expenditure it was capitalized into debt servicing. The financial models used represent a steady state so they do not represent the changes that would occur gradually as a farming property makes the transition from one farming system to another.

The models as presented report:

- Gross Revenue, which is the total revenue from all sources;
- Farm Working Expenses which report all of the working expenses of the farm;
- Cash Farm Surplus which reports Gross Revenue minus Farm Working Expenses; and

The Net Cash Position which reports the Cash Farm Surplus minus Interest, Taxation, Drawings, Capital Purchases, Development Expenditure and Principal repayments. Essentially it reports the true profit from the business.The individual financial models were then rated up against the land use mix to report the total performance of each of the scenarios.

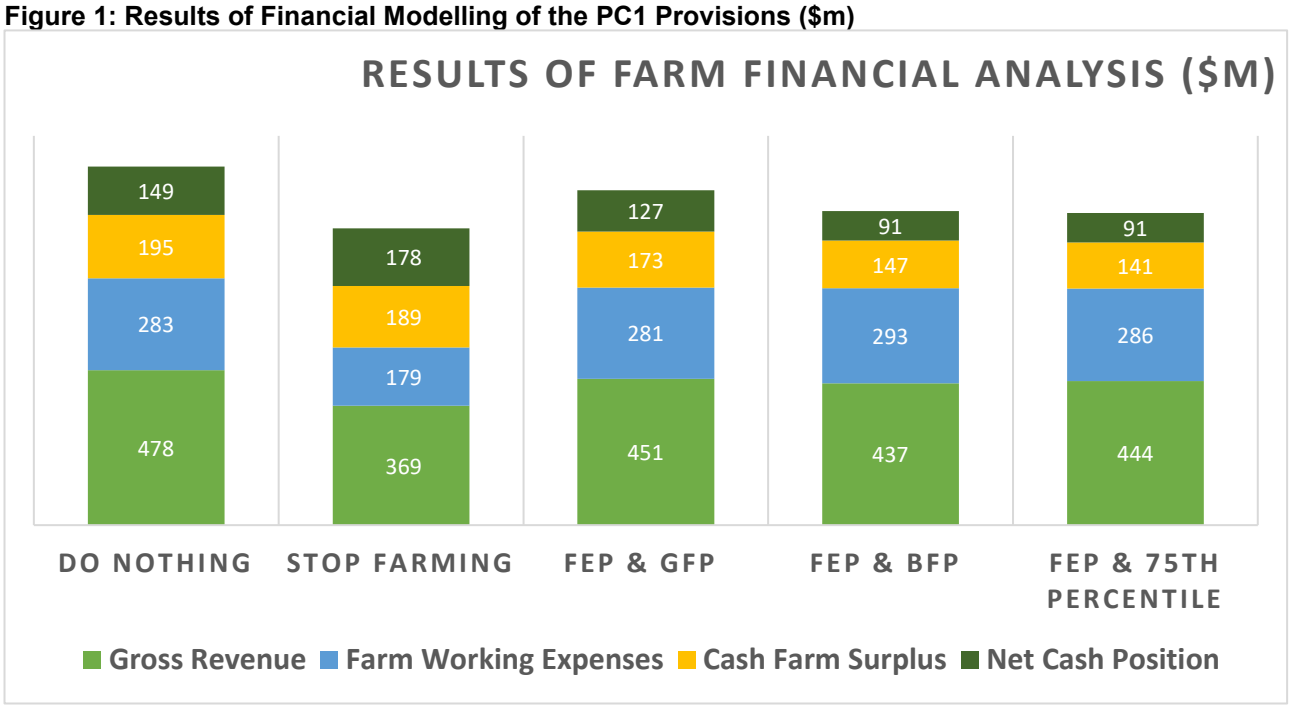
3 The Results of the Financial modelling

The results of my full financial modelling representing the PC1 provisions are shown in

Figure **1** and Figure 2.

[1] The AgriBusiness Group (2019): Wairakei Estate Nitrogen Mitigation Modelling using Overseer

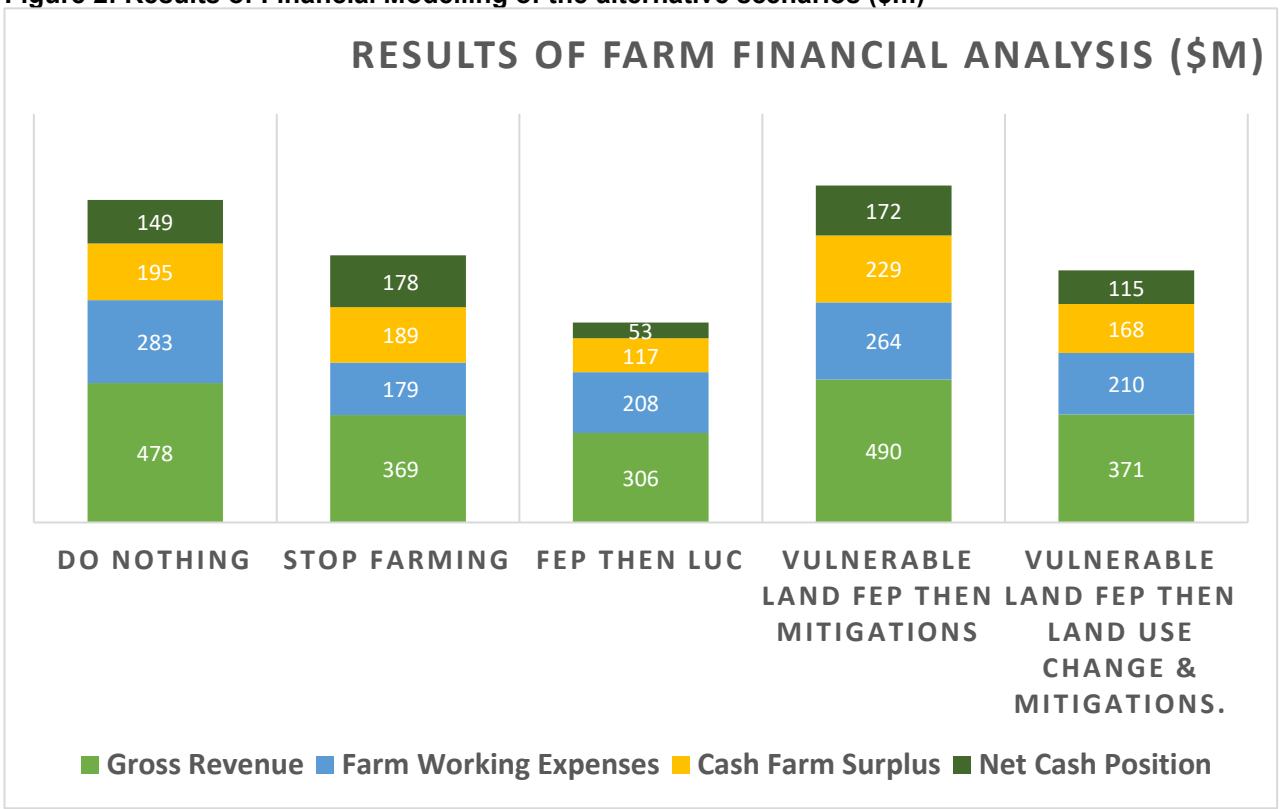
Figure 1: Results of Financial Modelling of the PC1 Provisions ($m)



As can be seen from

Figure 1 the Gross Revenue figure deteriorates between the scenarios, for example: FEP and GFP ($ 451 m), \FEP and BFP ($437 m), FEP and 75th Percentile ($444m).

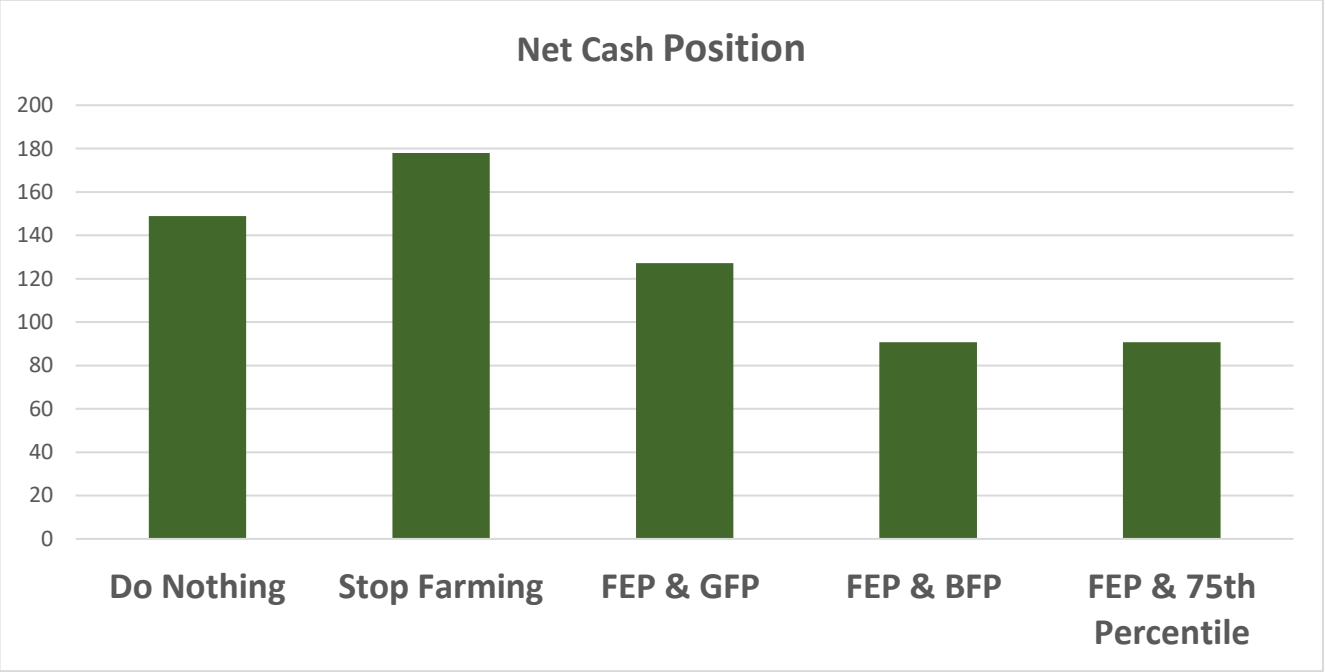
Figure 2: Results of Financial Modelling of the alternative scenarios ($m)



There is a considerable variation between the alternative scenarios with the FEP and LUC scenario ($306m) and then a considerable rise with the Vulnerable Land FEP and mitigations ($490m), and then a drop with the Vulnerable Land FEP and land use change and mitigations ($371m).

To evaluate the performance of the various scenarios in terms of the most attractive from a farming business perspective, the Net Cash Position as shown Figure 3 and Figure 4 was examined.

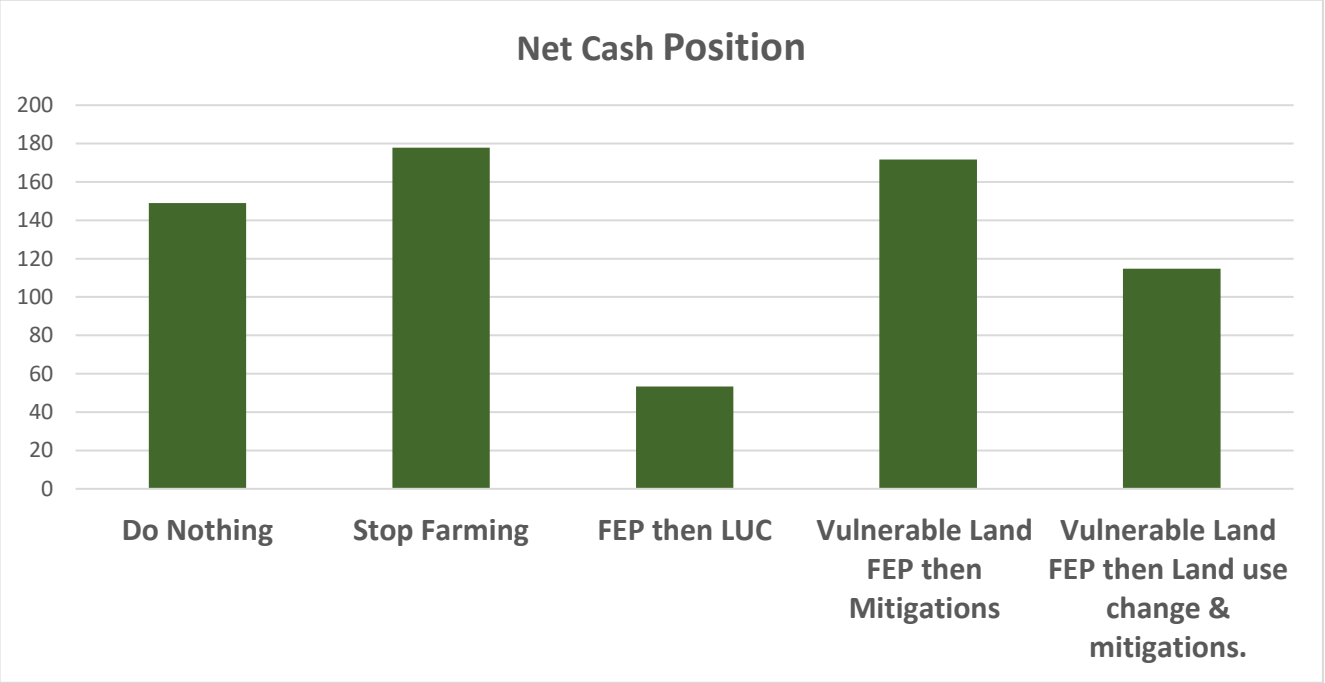
Figure 3: Net Cash Position of the modelling of the PC1 Provisions ($m)



As can be seen from Figure 3

Figure 3the Net Cash Position figure shows a more extreme difference than the Gross Revenue financial model although it shows a similar pattern. It deteriorates between the scenarios: FEP and GFP ($ 127 m), FEP and BFP ($91 m), FEP and 75th Percentile ($91m).

Figure 4: Net Cash Position of the modelling of the alternative scenarios. ($m)



As can be seen from Figure 4 there is a considerable downward change regarding the FEP and LUC ($53m), a considerable rise with the Vulnerable Land FEP and mitigations ($172m), and a lesser drop with the Vulnerable Land FEP and land use change and mitigations ($115m) scenario.

It can be concluded from the financial analysis from an overall perspective (and from an individual business owners perspective) that the FEP and GFP scenario is the most preferred of the three options that are relevant to PC 1 as notified.

Of the alternatives offered, the Vulnerable Land FEP and mitigations scenario would be the most preferred scenario over the FEP and LUC and the Vulnerable Land FEP with land use change and mitigations.

4 Flow on Impacts

The financial modelling reports the results at the “farm” or property gate. Past the farm gate there is a considerable amount of activity which results in a lot of additional economic activity or flow on impacts. The farm gate results, are referred to as the direct effects, the flow on effects are referred to as the indirect effects, and when they are added together they report the total economic effects of the activity.

The flow on impacts to the wider economy have been calculated by multiplying the results of the economic modelling by multipliers. The multipliers which are appropriate to be used were gained by purchasing a set of 2013 55 industry input / output tables from Insight Economics that were prepared for the Waikato Region.

The 2013 regional IO tables were derived using the standard methodology. Although the multipliers are derived from old data they are appropriately used to compare the alternatives. They were compiled after extensive reviews of the local and international literature to identify the most accurate and reliable methods for “regionalising” national IO tables. Then, based on these findings they were created as a robust and transparent method for converting New Zealand’s national IO table into a

corresponding set of regional tables. Once derived, the regional tables were subjected to detailed cross-checks against publicly available data to ensure accuracy and reliability. The end result is a full set of theoretically-sound and numerically-robust regional IO tables for 2013. Detailed checks were completed during the regionalisation process, which confirmed that all tables were accurate and reliable.

For this exercise three different factors are reported that can be derived with the use of multipliers:

- Gross Output which reports the total gross income generated by the activity.
- Value Added which reports the gross revenue minus all the costs of production.
- Employment which reports the total number of jobs expressed as full time equivalents (FTE).

The multipliers that were used in the analysis are shown in Table 2.

Table 2: Multipliers used in the Waikato analysis

	Output	Value Added	Employment
Sheep and Beef	1.43	0.57	4.35
Dairy	1.12	0.53	3.06
Other farming	1.20	0.35	4.42
Forestry	1.44	0.51	2.40

Each of the multipliers is used against the Gross Revenue as described in the financial analysis.

The results of the flow on impacts are shown in Table 3 and Table 4.

Table 3: Results of the Flow on Impact of the scenarios which represent the PC1 provisions.

	Do Nothing	Stop Farming	FEP & GFP	FEP & BFP	FEP & 75th Percentile
Gross Output $ m	532	524	510	517	517
Value Added $ m	555	361	349	356	356
Employment FTE	797	788	769	776	776

Table 4: Results of the Flow on Impact of the scenarios which represent the alternative scenarios.

	Do Nothing	Stop Farming	FEP then LUC	FEP then Mitigations on Vulnerable Land	FEP then Mitigations + Land use change on vulnerable land.
Gross Output $ m	532	524	330	563	414
Value Added $ m	555	361	282	400	307
Employment FTE	797	788	494	828	660

The conclusions that can be drawn from the flow on impact assessment of the scenarios run in the RDST model are:

- The three scenarios which represent PC 1 as notified are all very similar in terms of their flow on impacts. Therefore they would all be considered to contribute equally to the wellbeing of the community.
- The Vulnerable Land FEP and mitigations scenario is the most superior option in terms of the three alternatives of the flow on impacts reported and would be considered to be the preferred option in an economic sense.
- The FEP and LUC is the most inferior option of those tested.

APPENDIX 2

Dairy Industry Restructuring Act 2001 review

1 The DIRA was enacted in 2001 to enable the formation of Fonterra in order to drive the New Zealand dairy industry's economic performance in global dairy markets, and regulate Fonterra's dominance domestically, for the long-term interest of New Zealand dairy farmers, consumers and the wider economy.

2 In 2019, Cabinet decided to make changes to the DIRA to ensure that it remains *fit for purpose and is* ***effective*** *at promoting the best outcomes for all New Zealanders*.

3 Changed are needed to ensure inter alia: better management of on-farm performance.

4 To achieve these objectives, the following changes have (inter alia) been proposed:

4.1 Retain the open *entry and exit* provisions, including the non-discrimination requirement, *to manage ongoing risks* arising from Fonterra's large size and scale in New Zealand dairy markets.

4.2 Allow Fonterra to *refuse milk supply* from farmers in circumstances where milk is *not compliant or unlikely to comply with Fonterra's terms and standards of supply* or is supplied from newly converted dairy farms.

4.3 Clarify that Fonterra's *terms of supply can relate to*, and price differentiate on the basis of, various *on-farm performance matters, including environmental,* animal welfare, *climate change and other sustainability standards*.

[Emphasis added].

5 I understand that the Government intends to induce an amendment Bill in Parliament later this year to give effect to these proposed changes. The points emphasized in para 4 above could usefully be included in PC1 Schedule 2 to cover the matters addressed in my evidence regarding consenting at scale. They would ensure that the policies and rules recommended by Mr McKay in his evidence would be effective.