

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

(“WRC”)

**STATEMENT OF PRIMARY EVIDENCE OF PAUL FREDERICK LE
MIERE FOR FEDERATED FARMERS ON HEARING TOPIC 3**

5 July 2019



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STATEMENT OF EVIDENCE OF PAUL FREDERICK LE MIERE

Introduction

1. My full name is Paul Frederick le Miere. I am the North Island Regional Policy Manager at Federated Farmers.
2. My qualifications and experience are set out in paragraphs 19 to 28 of my Statement of Evidence for Topic 1 dated 15 February. At paragraphs 29 to 33 of that statement I also provide an explanation of what Federated Farmers does.
3. This statement of evidence focuses on the following matters arising from the Block 3 section 42A report and/or that have arisen during the Block 2 hearing and for which the Hearing Panel have sought feedback as part of the Block 3 hearing:
 - a. Setbacks – quantification of the area that would be covered by certain setbacks, the cost of riparian planting and maintenance, the value of the land covered by the setback and the cost of fencing waterbodies (particularly ephemeral or intermittent streams).
 - b. Farm Environment Plans (“FEPs”) – Federated Farmers’ views or position on FEPs, particularly in light of questions the Hearing Panel has raised about whether they can be a permitted activity.
 - c. Good Farming Practice (“GFP”) – Federated Farmers’ involvement in the governance group that developed the GFP principles and our views on how it should be applied in PC1.

Fencing, setbacks and waterbodies

4. During the Block 2 hearings, the Hearing Panel has heard evidence from three parties who seek setbacks greater than the 1-3m recommended in the Block 2 section 42A report and/or the exclusion of stock from additional waterbodies:
 - a. Fish & Game proposes a minimum setback of 5m, as well as the fencing of and setback from intermittent waterbodies and wetlands.
 - b. Wairakei Pastoral Limited (“WPL”) proposes a setback of 15m from waterbodies (and 75m from the main stem of the Waikato River).
 - c. DOC proposes a setback of 20m from waterbodies and the fencing of and setback from intermittent and ephemeral waterbodies (with sheep and goats also excluded from certain waterbodies).

5. The Panel has asked these parties questions about the area of land covered by these proposals and the costs of these proposals. These parties have not been able to answer these questions orally and have said that they would respond in their written evidence for Block 3.
6. I thought that it would be helpful to set out Federated Farmers' views about the area of land covered by these proposals and the likely costs. I thought that it was helpful to do that in primary evidence to provide other parties with an opportunity to respond through rebuttal evidence.
7. I asked our GIS analyst to map the various areas in the Catchment that are covered by the above proposals and I have then undertaken an exercise to cost and value the actions required or areas of land covered. I have set out my findings in **Annexure PLM1**. I explain below the assumptions I have made in my analysis and my findings.

Fencing costs

8. The fencing costs will be determined by the waterbodies that the stock exclusion requirements in Schedule C apply to. In my Block 2 evidence, I provided a rough indication of the potential fencing costs by reference to a mapping and costing exercise Federated Farmers did in response to the draft national stock exclusion regulations.¹ These costs did not include intermittent or ephemeral streams.
9. The section 42A report recommends that all permanent and intermittent waterbodies are fenced (regardless of size) but proposes that the definition of waterbodies in Schedule C could be amended to include intermittent waterbodies where the bed is predominantly unvegetated. Fish & Game and DOC seek the inclusion of intermittent as well as ephemeral waterbodies. The Hearing Panel asked Fish & Game if it had mapped intermittent waterbodies. Its witnesses responded that they had not but that could be done and evidence would be provided in Block 3. The Hearing Panel has also asked several parties about the fencing and other costs but no party has been able to quantify this (that I am aware of).
10. I am not aware of any GIS layer or database that has mapped intermittent or ephemeral waterbodies. By their nature, they are difficult to map because they are areas that are only wet at certain times of the year or in some years (during certain seasons or certain weather events). To properly understand the likely areas of

¹ See paragraphs 54 and 55 of my Block 2 evidence.

land affected, and the cost, you would have to undertake a detailed mapping exercise on every piece of land in the Catchment.

11. There is a Ministry for the Environment GIS layer for rivers that includes first to seventh order streams and rivers.² The first order streams are the smallest. They then range all the way up to Order 6 (which is the Waipa River) and Order 7 (which is the Waikato River). In general, they do not include ephemeral or intermittent streams but first order streams include the smallest tributaries so there may be some times of year that some of them dry up (and in that sense they may include some, but not all, intermittent streams).
12. For first to seventh order streams, we assessed (and Table 1 of Annexure PLM1 contains that assessment):
 - a. The total distance of first to seventh order streams in the GIS layer, in the PC1 Catchment and on land that carries stock.³
 - b. The likely costs of fencing these streams.
 - c. The quantity of land that would be captured by various setback distances from these streams (as proposed in PC1 or by the above parties).
13. In terms of fencing costs, Table 1 provides an indication of the costs for fencing all streams for which there is a GIS layer. However, this does not provide an indication of the cost of fencing all intermittent and/or ephemeral streams (and there may be some permanent streams that have not been included in the GIS layer).
14. This analysis does not take into account streams on dairy farms that have already been fenced. Under the Sustainable Dairying Water Accord permanent waterways that are wider than 1m and deeper than 30cm are required to be fenced. It is likely that some of the lower order streams will not have been fenced but I would expect that the vast majority of order 3 to 7 streams on dairy land will have been fenced (as I explain below any overestimation of cost in my analysis as a result of this is likely to be offset by underestimation in other parts of my analysis).
15. This analysis also does not take into account slope of land. The section 42A report proposes that it may be appropriate to exclude some streams on land above a

² Ministry for the Environment – River Classification Waikato (2010)

<https://koordinates.com/from/data.mfe.govt.nz/layer/51856/>

³ For this we relied on Agribase and excluded categories of land that are not associated with stock grazing such as urban, native, DOC, forestry etc.

certain slope from the stock exclusion requirements. However, it does not recommend a slope threshold so whether this applies or the slopes to which it applies (and therefore streams excluded) is not clear. In addition, my understanding is that the proposals of the parties above are to apply to streams regardless of slope.

16. A further aspect of this analysis is that it has only considered streams that are on land that is a category on Agribase that involves stock grazing.⁴ There are streams that are on conservation land or reserve land, for example, and are grazed by the adjoining landowner (and treated as part of the farm). However, the way that Agribase links the property boundaries and farm types means that by excluding conservation land, there are streams that are excluded from the analysis but which would need to be fenced (and the cost borne by the farmer as the farmer would be responsible for excluding stock). This could also raise practicality issues. For example, if the property boundary is 10m back from the river, and fencing with a 5m setback is required, the farmer might decide to simply fence their boundary so that they are not responsible for riparian planting and maintenance. An issue would then arise as to what would happen to this strip and who would be responsible for planting and maintenance.
17. This is common along the length of the Waikato and Waipa rivers where there are large reserve and esplanade strips along the sides. My understanding is that these areas are currently grazed by many farms and treated as part of the property. However, the rivers themselves do not border the farmland and for that reason the distance of Order 6 (Waipa River) and Order 7 (Waikato River) streams are only 31.4km and 39.7km in my Table 1, Annexure PLM1.
18. In Table 1, Annexure PLM1, I have calculated the cost of fencing all first to seventh order streams (i.e. assumed that the fencing cost would be spread over all land). In calculating the cost of fencing, I have assumed a cost of \$10 per metre. While the cost of fencing dairy land would likely be lower than this (as they may only require a one or two wire electric fence with quarter round posts every 4-7m), the costs of fencing drystock properties are likely to be significantly higher than this (as they will most likely require 8 wire fences with quarter round posts and battens).⁵

⁴ I list the Agribase land use types on page 8 of my Block 2 hearing evidence dated 17 May 2019.

⁵ For example, the Hill Country Farmers' Group provided an invoice that set a price of \$18.08 per metre – slide 11 of this document <https://www.waikatoregion.govt.nz/assets/Day-30-item-11-HCFG-Presentation.pdf> and the Te Awarua o Porirua project assumed a price of \$20 per metre for

19. In summary, Table 1, Annexure PLM1, shows that the total cost of fencing all order streams at \$10 per metre is \$235 million.

Areas of dairy land already fenced

20. I acknowledge that my analysis of fencing costs could overstate the cost of fencing because most dairy farms have fenced Accord waterbodies. However, this does not include the costs of water reticulation and stock crossings that would be associated with the cost of fencing many drystock and hill country properties. As explained in my Block 2 evidence, these costs are likely to be very significant (several of the Ag First and Baker Ag case study farms estimated these costs at several hundred thousand dollars per farm).⁶ There are also additional costs that could arise from any earthworks or site preparation works needed to carrying out the fencing (and these are not included in the fencing cost).
21. In addition, the fencing costs for drystock farms may be double the \$10 per metre cost I have assumed (due to the difficult terrain). If all of this is taken into account, I consider my estimate of fencing costs of \$235 million is likely to be conservative (and as identified above, this does not include streams that are not captured in the Stream Order layer but are captured by Schedule C).
22. Notwithstanding these factors, I thought there was merit in considering the costs of fencing, areas of setbacks and costs of planting and maintaining setbacks on just drystock land. This analysis is set out in **Annexure PLM2**.
23. I have adopted two different assumptions for the drystock land compared with the analysis of total area of land – the price of fencing is \$15/m (compared with \$10/m in Annexure PLM1) and the value of land is \$15,000/ha (compared with \$20,000/ha in Annexure PLM1). The price of fencing is higher to reflect the higher cost of fencing drystock properties (as explained above). I explain below why I consider \$15,000/ha to reflect the value of drystock land.
24. This analysis is only a sub-set of the cost. Depending on the final wording of Schedule C, there is still likely to be significant distances of streams on dairy land that are not currently fenced but will need to be fenced with riparian setbacks. However, it does provide an indication that even of only drystock land is considered, the fencing costs are significant and if the costs of setbacks and

drystock properties <http://www.gw.govt.nz/assets/Whaitua/Assessment-of-rural-economics-and-mitigation-costs.pdf>

⁶ Paragraphs 58 and 59 of my Block 2 evidence.

riparian planting is included, the costs are very significant (especially as the setback distances increase).

25. In summary, Table 1, Annexure PLM2, shows that the total cost of fencing streams on drystock properties at \$15 per metre is \$141 million.

Intermittent streams

26. To understand the likely costs of fencing all intermittent and/or ephemeral waterways, I looked at five case study farms. The case study farms are:
- a. Mr Millner's case study farm 2 (this is the farm referred to in Annexure IFM3 of Mr Millner's Block 2 hearing evidence).
 - b. Farms A to E that are referred to in the Hill Country Farmer's Group ("HCFG") evidence for Block 1⁷ and Block 2.⁸
27. In respect of the intermittent streams on Mr Millner's farm 2, Mr Millner discusses several intermittent and ephemeral streams he observed on that farm in Annexure IFM3 of his Block 2 hearing evidence. He also provides photographs of three of these streams. I asked our GIS analyst to map the areas of land that appear to be intermittent or ephemeral streams and to compare that with the GIS layer for stream order. This was not ground truthed in detail but it was reviewed by Mr Millner (who has walked the farm).
28. In respect of the HCFG case study farms, I asked our GIS analysis to compare the streams identified by the HCFG as perennial or intermittent streams in their Block 2 evidence (see footnote 7 above) with the GIS layer for stream order. I have not visited these properties or discussed our findings with the HCFG. My intention was solely to identify whether the GIS layer was capturing intermittent streams.
29. My analysis of this is set out in Table 8 of Annexure PLM1. My conclusions from this table are that:
- a. For each farm, there is a significant distance of streams that are not represented by the stream order layer but are likely to be captured by a proposal to include intermittent waterways in Schedule C.

⁷ See the Baker Ag report from page 34 of this statement of evidence -

<https://www.waikatoregion.govt.nz/assets/WRC/Council/Policy-and-Plans/HR/43.pdf>

⁸ See maps for HCFG case study farms A to E presented in evidence presented during Block 2 hearing - <https://www.waikatoregion.govt.nz/assets/Day-30-item-10-HCFG-attachment-1.pdf>

- b. As a percentage of the stream order waterways, the additional waterways range from 54% to 200% longer.
 - c. This indicates that my estimate of the costs of fencing above, and value of land and cost of riparian planting discussed below, are likely to be significantly understated (if intermittent streams are to be included in Schedule C).
30. To illustrate the distances of stream order streams and the distances of the additional intermittent and perennial streams, I asked our GIS analyst to mark these on a map for each of the five farms assessed in Table 8. A copy of those maps is attached as **Annexure PLM3**.
31. A final point that I wish to clarify is that the total stream length (for stream order streams and the additional intermittent and perennial streams) for Mr Millner's farm 2 in Table 8 of Annexure PLM1 is 15.6km. This differs from page 9 of Annexure IFM3 of Mr Millner's Block 2 evidence, which states that the total distance of fencing required is 26.2km.
32. The reason for the difference in these two figures is that my analysis in Table 8 is about stream length, not fencing distance. When fencing a stream, the distance of fencing is double the stream length because each side of the stream must be fenced. For a property that has some streams along its boundary (like Mr Millner's farm 2), the fencing distance will not be double the stream length because that farm only has to fence the side of the stream within their boundary.
33. When I undertook my analysis of stream fencing cost in Table 1, I doubled the stream length distance in order to obtain an estimate of fencing cost because both sides of every stream will need to be fenced.

Setbacks

34. Table 1 of Annexure PLM1 sets out the area of land that would be covered by the different sized setbacks (1m and 3m proposed by PC1, 5m proposed by F&G, 10m and 20m proposed by DOC, and 15m proposed by WPL) for each of the stream orders. It includes the area of land that would be part of the setback on both sides of the stream. It does not include the area of land that would be covered by intermittent or ephemeral waterways (as identified above, this would likely be significant areas of land).
35. Tables 2 to 7 of Annexure PLM1 set out the estimated land value, riparian planting costs and weed control costs for the different setback distances. The purpose of

this was to understand all of the economic implications of the various setback distances.

36. In estimating these costs, I have relied on the following assumptions:
- a. The land value is \$20,000/ha. This is a conservative average of the likely value of dairy land in the Waikato⁹ and drystock land in the Waikato.¹⁰ In Tables 2 to 7 of Annexure PLM2 I have assumed a land value of \$15,000/ha as an average of the value of finishing and grazing land, recognising that there is likely to be a higher proportion of grazing land than finishing land.
 - b. The cost of riparian planting is \$45,000/ha (based on 4,500 plants per ha).¹¹
 - c. The cost of weed control is based on a three year total cost of \$22,000/ha. This is based on an estimate of the likely cost over the first three years after planting for weed control, pest control and maintenance. I did not estimate an ongoing or annual cost because this is difficult and site specific. The costs in the first three years are likely to be the highest as the plants are establishing (i.e. they cannot out compete weeds until they get big enough).¹²
37. As expected, the total costs increase significantly as the area of setbacks increase, ranging from \$439 million for a 1m setback (Table 2, Annexure PLM1) to \$4.3 billion for a 20m setback (Table 7, Annexure PLM1).
38. I also undertook this analysis for streams that are on drystock land and my conclusions are similar – the costs range from \$218 million for a 1m setback (Table 2, Annexure PLM2) to \$1.7 billion for a 20m setback (Table 7, Annexure PLM2).
39. Federated Farmers' position on the streams to be fenced and the area of setback is explained in our Block 2 evidence. In summary, we support a 1m setback from permanent waterways (where stock units are above 18) as a minimum standard, with the ability to tailor setbacks and stock exclusion through a FEP e.g. a greater

⁹ As at 31 May 2019 the average price of dairy land in the Waikato was \$38,762

<https://www.interest.co.nz/charts/rural/farm-prices-dairy-land>

¹⁰ As at 31 May 2019, the average price of finishing land in the Waikato was \$40,882 and grazing land was \$10,922 <https://www.interest.co.nz/rural/resources/farm-sales>

¹¹ Based on assumptions in these reports:

Ministry for Primary Industries Stock Exclusion Costs Report, MPI Technical Paper No: 2017/11

<https://www.mpi.govt.nz/dmsdocument/16537/direct>

Assessment of rural economics and mitigation costs Final Report - Te Awarua-o-Porirua

Collaborative Modelling Project

<http://www.gw.govt.nz/assets/Whaitua/Assessment-of-rural-economics-and-mitigation-costs.pdf>

¹² See footnote above.

setback could be proposed where necessary or an intermittent or ephemeral wetland could be fenced where needed to address a critical source area. We consider that this analysis of cost is consistent with our work on the draft national stock exclusion regulations and supports our proposal for risk based and tailored actions where necessary as opposed to a “one size fits all” minimum standard that imposes significant cost on farmers without consideration of environmental benefit.

40. Federated Farmers considers that there ought to be a reasonable pathway for obtaining FEPs and that pathway ought to provide for tailoring of things like stock exclusion.

Environmental benefit

41. Federated Farmers’ position is that a 5m setback and/or fencing intermittent waterbodies may be appropriate in certain circumstances. However, our position is that such requirements are too blunt as minimum standards in Schedule C (and will impose significant cost without consideration of the corresponding benefit, which will vary from case to case). FEPs ought to provide for consideration of the appropriate mitigations to address critical source areas, whether that is wider setbacks, fencing intermittent waterbodies or alternative mitigations such as water reticulation, riparian planting or stock management.
42. This is supported by Dr Doole’s and the TLG’s conclusions and modelling. In particular, TLG concluded that modelling could not justify a 5m setback everywhere¹³ and Dr Doole’s modelling considered 5m setbacks in only certain areas with a 1-3m setback adopted as the minimum standard (and the policy mix still exceeded the 10% required improvement, with the lowest median improvement being 31%).^{14, 15, 16}

Federated Farmers’ views on FEPs

43. In principle, Federated Farmers supports all (or the majority of) farmers obtaining FEPs. Federated Farmers sees them as a key tool for farmers in identifying and

¹³ <http://waikatoregion.govt.nz/assets/PageFiles/28959/21/402%20-%203644089.pdf>

¹⁴ Pages 26 and 34 of this report modelled 5m buffer widths for some streams but not for all (and the net result was that the policy mix exceeded the 10% target) -

<http://waikatoregion.govt.nz/assets/PageFiles/28959/21/402%20-%203644089.pdf>

¹⁵ Page 4 of this report reviewed the literature on setbacks and concluded that 5m was not necessary as a minimum standard -

<https://www.waikatoregion.govt.nz/assets/WRC/Services/publications/technical-reports/HRWO-trs/TR201847.pdf>

¹⁶ Page 12 of this report discusses why a 1-3m setback is justified -

<https://www.waikatoregion.govt.nz/assets/WRC/Services/publications/technical-reports/HRWO-trs/TR201859.pdf>

appropriately managing risk. The various FEP projects that we have been involved in around the country have shown that farmers are very likely to make changes to their practices if they have a plan showing them how to do that.

44. For this first stage of the implementation of the Vision & Strategy, Federated Farmers considers that the critical step is farmers obtaining FEPs to start the trajectory of change and improvement; and Council collating more data to better understand the catchment. Federated Farmers considers that the focus ought to be on creating an efficient and implementable process that is outcomes focused. Federated Farmers is very concerned that the changes proposed by the section 42A report will do the opposite – create an inefficient process where farmers focus on doing the minimum needed to comply and there are significant delays to obtaining FEPs and starting practice change.

Pathway for obtaining FEP

45. Federated Farmers considers that there ought to be a reasonable pathway for FEPs. We consider that this can be achieved by:
 - a. Providing for FEPs as a permitted activity for low intensity drystock farms as proposed in Mr Eccles' evidence. This is similar to the Simplified FEP we proposed in our submission and similar to the approaches elsewhere, such as the simplified Nutrient Management Plan in Bay of Plenty Regional Council's Plan Change 10 for properties that are 5-10ha.
 - b. Providing for FEPs as a permitted activity for farms that are part of a Certified Industry Scheme ("CIS"). Federated Farmers considers that this would not only significantly improve WRC's ability to implement PC1 but also recognise and provide for the role of industry in corralling and ensuring consistency in the FEPs prepared by those who are part of the scheme. Also, from our members' perspective, the feedback has been that they value having the choice of dealing with their industry body through the CIS or with WRC through a resource consent. Given that Fonterra and Miraka have said that they would not prepare a CIS if FEPs under it were not a permitted activity, if a consent was required for all FEPs this would remove this benefit for farmers.
 - c. Providing for FEPs as a controlled activity. Federated Farmers supports tailored FEPs and considers that these can be achieved through a controlled activity consent as a reasonable and cost effective way of assisting farmers to obtain FEPs and start practice change. Federated Farmers is concerned about

comments by the section 42A authors that Council would need to turn down consent. There does not seem to be a basis to turn down consent given that these are applications for existing farms with the matters listed in Schedule 1 relating to how that farm operates (suitable for a controlled activity) as opposed to they type of farm, for example (which could be a reason to need the ability to turn the consent down). In addition, Federated Farmers considers that as part of the preparation of the FEP there ought to be the ability via a controlled consent to propose alternative actions to those required by Schedule C.

46. As explained below, Federated Farmers supports the focus in Schedule 1 on GFP principles but considers that amendments are needed as proposed by Mr Eccles and Mr Millner. Federated Farmers considers that tailored FEPs prepared under Schedule 1 ought to be able to be obtained as a permitted activity. We have been directly involved in the Southland, Canterbury and Gisborne Regional Plans, and Tukituki Plan Change 6. All of these documents provide for FEPs as permitted activities and the frameworks for the preparation of FEPs are less directive than what is proposed in Schedule 1.¹⁷
47. Federated Farmers considers that the real merit in a FEP is both having a reasonable process for obtaining it and providing for a tailored and risk based assessment. We consider that this can be achieved through a permitted FEP prepared by a CFEP who is certified and audited by Council but, more importantly, is the right person to make the tailored and risk based assessment (as opposed to a Council consenting officer).
48. The indications to date from the Hearing Panel have been that it has concerns with providing for FEPs as a permitted activity unless the standards for the FEPs are clear and narrow. In the event that this is what the Hearing Panel decides, Federated Farmers would agree in principle with a narrower or more specific schedule for the preparation of these FEPs as long as there was an appropriate alternative consenting pathway. That would ensure that a permitted activity pathway would be provided for a standardised farm that “fits the mould” (and would provide for an effective CIS regime to relieve the Council’s implementation burden), whilst other farms that need more tailored actions would still have a reasonable controlled activity pathway.

¹⁷ For example, Schedule N to the Southland Regional Plan is a two page document with the focus on the identification of GMPs. Schedule XXII to the Tukituki Plan is a page and a bit with a focus on meeting high level management objectives.

49. On this basis, Federated Farmers supports the draft Schedule 1A that has been proposed in Mr Eccles and Mr Millner's evidence.

FEP grading and review system

50. A concern that was raised in Federated Farmers' submission is that the actions in a FEP should not become consent conditions. Our concern is that reasonable flexibility is needed in farming to adapt and respond to economic, environmental and climatic events (many of which are unforeseeable) such as drought, floods and a downturn in the wool price or dairy pay out.
51. We are concerned that making the detailed actions contained in a FEP (which could be something like plant 16 poles in paddock 5 on 10 September 2022 to control erosion) are not appropriate in a strict liability regime (as a farmer would be in breach of the consent conditions and prosecuted if only 10 poles were planted by 10 September 2022, for example, due to either a shortage in supply or a flood washing out fencing and resources being redirected to repair that).
52. Federated Farmers considers that the section 42A report proposes an innovative approach for addressing this issue with the grading and review system. Federated Farmers considers that this will help to ensure that Council's scarce resources are directed towards the worst farmers (and ensure they are held accountable). The ability for farmers to amend FEPs will also ensure that they are able to respond and adapt to change. It might also encourage innovation.
53. This system is going to rely on the content of FEPs (i.e. actions that are able to be audited), the certification and auditing of the CFEP, the review and audit of FEPs, and review and amendment of FEPs. Federated Farmers is concerned about the potential for disputes or disagreement to arise through these processes.
54. Federated Farmers considers that there needs to be provision for dispute resolution, as further discussed in the evidence of Mr Eccles. Having a dispute resolution mechanism would be a proactive way of providing for any issues and, in our view, would greatly assist to speed up the process (with the focus being on making sure farmers obtain FEPs quickly and start implementing them, as opposed to wasting time and resources litigating the interpretation and application of Schedule 1 to a particular FEP).

2018 GFP document

55. The section 42A report recommends re-writing Schedule 1 following a report by Rob Dragten. The schedule now focuses on objectives for management areas and GFP principles for each objective. The principles are mostly based on the principles contained in the Good Farming Practice Action Plan for Water Quality 2018 (“2018 GFP document”). A copy of this is attached as **Annexure PLM4**. The principles are set out on page 4 of that document.

Development of 2018 GFP document

56. The 2018 GFP document was developed by a governance group comprising senior representatives of the primary sectors, regional councils and the Water Directorate (Ministries for the Environment and Primary Industries). Federated Farmers was represented on the group by our Board Member and Water Spokesman, Chris Allen.
57. The 2018 GFP document is a voluntary commitment, intended to accelerate the uptake of GFPs for water quality (and quantity) outcomes, to measure and demonstrate this uptake, to assess the impact and benefit of those practices, and to communicate progress to the wider public.
58. The 2018 GFP document was just the start of the work envisaged by the group. Page 2 of the document sets out work envisaged between now and 2020. My understanding is that a work stream has just commenced (one of my policy advisors is a member) to look at FEPs and how GFPs can be reported against and demonstrated. The intention is to develop a national framework and audit process for FEPs.
59. The principles listed on page 4 of the 2018 GFP document are largely based on the 2015 Industry Agreed Good Management Practices Relating to Water Quality that were first applied in Canterbury. The intention is that the GFP principles would be applied to each catchment or region by focusing on those that are the priority for the particular area and the focus would be on getting practice change actions in place quickly.
60. The principles were very much part of a negotiated document. I was asked to provide advice to Mr Allen (our representative on the governance group) at various junctures. There were several iterations in the wording and compromises made along the way. It was not intended that the wording would be rigidly applied in the regions and it was accepted that there would be changes. It was also anticipated that the adoption of the principles would be part of a community process, they

would be tailored to each region and used in a FEP to develop practical, targeted actions.

61. There is a high level illustration of the intended application of the GFPs to a specific region and farm on page 8 of the 2018 GFP document. There are also examples of successful practice change, monitoring and reporting initiatives on pages 12 and 13. This includes national industry work (such as the Beef + Lamb land environment plans and the Sustainable Dairying Water Accord) and regional work such as the Upper Waikato Sustainable Milk Plan project (this resulted in reductions of 5% and 12% for N and P after implementation of 70% of FEP actions (each FEP had an average of 9.2 actions), and was estimated to deliver reductions of 8% (N) and 21% (P) once all actions were complete).
62. The governance group intended the GFP principles to act as a guide for the development of good management practices into the future. The intention was that actions and practices would be developed around what your peers could reasonably expect you to do on your farm.
63. At the time the 2018 GFP document was released, we published it on our website (along with examples of the application of the principles to specific farms, such as Mr Garland's farm) and widely publicised it in member advisories and through our Friday Flash newsletter.
64. In response to the 2018 GFP document, Dairy NZ developed a Good Management Practices guide to assist with illustrating how the GFP principles might translate into farm management areas and practices or actions:

https://www.dairynz.co.nz/media/4106341/Good_management_practices_April_2016.pdf
65. There is also a lot of other helpful work being undertaken at industry and regional council level, that is relevant for the consideration of GFPs and FEPs (and also for any guidance material prepared by the regional council). This includes:
 - a. The menus of practices to improve water quality on dairy, drystock and cropping land developed by Waikato Regional Council in 2013 (revised in 2015) in consultation with industry groups (I was involved in this process):

<http://www.waikatoregion.govt.nz/community/your-community/for-farmers/farm-menus/>

- b. Beef + Lamb's Land and Environment Plan work, with templates developed for environment plans on a regional basis. The link Waikato document is:

<https://beeflambnz.com/sites/default/files/factsheets/pdfs/RB7-Waikato-FEP-guidelines.pdf>

<https://beeflambnz.com/sites/default/files/factsheets/pdfs/editable-PDF-8-waikato-farm-environment-plan-workbook.pdf>

- c. The Foundation for Arable Research has developed FEP templates in response to rules in the Canterbury Regional Plan:

https://www.far.org.nz/research/environment/farm_environment_plans

- d. Irrigation New Zealand has developed a FEP template for irrigated land as part of irrigation schemes or collectives (this is comprehensive 30 page document set up like a "yes/no/other" fill in the boxes exercise):

<https://www.irrigationnz.co.nz/KnowledgeResources/IrrigationFEP>

- e. Fonterra's nitrogen risk scorecard.

Schedule 1 objectives

66. The GFP principles in Schedule 1 (as recommended by the section 42A report) have been grouped into six management areas that match the 2018 GFP document. Where Schedule 1 departs from that document is that it also proposes objectives for each of the six management areas.
67. As explained above, the intention of the 2018 GFP document is that the principles would be tailored and prioritised for each particular region. Our concern is that the objectives are new layer that has been added and in doing so potentially add a different intention or qualification to the principles.
68. Many of the objectives focus on minimising the losses of contaminants. Federated Farmers is concerned that this is a departure from the GFPs and is an unclear and open ended obligation. "Minimising" will mean different things to different people. A farmer will have a very different perspective on whether a loss is the minimum for their farm system and location compared with a person who does not understand their system or location, for example. This is likely to create uncertainty for farmers as to the extent to which their losses need to be minimised. Mr Millner also addresses this in his evidence.

69. The GFP principles do not use many references to “minimise” and where it is used it is usually in the context of a resource use efficiency assessment. This provides important context for the extent to which losses would need to be minimised i.e. to the extent needed to maximise efficiency.
70. Efficiency of resource use is an important consideration in many of the FEP guidance documents I reference above. An example is Objective 1 on page 11 of the Beef + Lamb FEP guidelines.¹⁸ The concept of minimising nutrient losses in that objective is in the context of maximising nutrient use efficiency.
71. In contrast, Objective 4 of the recommended changes to Schedule 1 focuses on minimising losses of sediment, microbial pathogens, phosphorous and nitrogen to waterways. There is no consideration of maximising nutrient use efficiency or any other efficiency consideration.
72. Objective 6 of the recommended changes is another example of the lack of consideration of efficiency. That objective focuses on minimising contaminant losses to waterways from soil disturbance and erosion with no efficiency of resource use consideration. On their own, these objectives are open ended with a potential implication being that losses of the four contaminants to waterways needs to be significantly reduced (and at one extreme, eliminated).
73. Federated Farmers considers that the objectives ought to be removed. The GFP principles provide for a fuller statement of the approach required, that provides appropriate parameters and also provides for a resource use efficiency assessment. This provides more certainty for farmers and is consistent with the expectation of the 2018 GFP document that tailored and practical FEPs would be generated.
74. In the event that the objectives are not deleted, Federated Farmers considers they ought to be amended as proposed by Mr Eccles and Mr Millner to provide more context and certainty.

Purpose of FEPs

75. Federated Farmers also considers that the purpose of FEPs ought to clearly stated in Schedule 1 as proposed in Mr Eccles’ evidence. In our submission, we explained why we considered most practicable action (“MPA”) was an appropriate framework. While we consider that the GFP framework proposed is likely to be very similar in practice, we still consider that it is important to provide guidance as

¹⁸ <https://beeflambnz.com/sites/default/files/factsheets/pdfs/RB7-Waikato-FEP-guidelines.pdf>

to the issues in each sub-catchment and proportionate reductions required (both of which would be indicated in Catchment Profiles¹⁹), and to consider what is reasonably practicable (particularly in response to issues submitters like the Hill Country farmers have raised – it may be technically possible to fence waterways but there is likely to be a more reasonable and practical alternative mitigation).

76. Federated Farmers considers that these amendments are consistent with the 2018 GFP document. In particular, the intention that GFPs are tailored and prioritised for each region, catchment or FMU. Consideration of the Catchment Profiles provides for that tailored assessment of the water quality priorities (and therefore GFP priorities) for each sub-catchment. It is also consistent with the intention for tailored and practical FEPs. Consideration of reasonable and practical mitigations provides for a focus on what is practical on a particular property as opposed to solely considering what could be possible.
77. Federated Farmers considers that this is important given that for any risk, critical source area or hot spot, there will be a myriad of potential actions or mitigations. It is important to have a framework or basis upon which to evaluate and assess them and we consider that adding the wording about the purpose of FEPs would assist with that. We found this important when we were working with Waikato Regional Council to develop the farm menus (referred to above). We found that considering the environmental effect and cost of the various mitigations was very helpful.²⁰
78. The wording for the purpose section in Schedule 1 proposed by Mr Eccles is also consistent with how Council's implementation team is approaching FEPs. I have had various meetings with the implementation team and Dr McLay about the work they are doing on the online portal and catchment profiles, to assist farmers who want to start preparing FEPs now.

Schedule 1 principles

79. The wording of the GFP principles in Schedule 1 is not exactly the same as the wording in the 2018 GFP document. Attached as **Annexure PLM5** is the principles in the 2018 GFP document with the changes made by the section 42A officers' recommendations for Schedule 1 shown as track changes.

¹⁹ We do not envisage WRC undertaking detailed sub-catchment forensics or a detailed management plan process for each sub-catchment, but rather collating evidence that would provide guidance for the CFEP in selecting appropriate actions. This could include information such as the pie charts prepared by Jacobs for Horticulture New Zealand that show the contributions of the different sectors to the four contaminants in each sub-catchment.

²⁰ <http://www.waikatoregion.govt.nz/community/your-community/for-farmers/farm-menus/>

80. In principle, Federated Farmers does not have an issue with amending the wording of the GFP principles where appropriate (as is the case where it is necessary to tailor them to a particular catchment or region). However, we consider that some of the wording changes have changed the intention of the principles and some additional changes are required to ensure it is tailored to the PC1 catchment. Federated Farmers considers that the changes proposed in Mr Eccles' and Mr Millner's evidence achieve that.
81. One example is the replacement of the words "manage appropriately" in Principle 1 with "minimise losses of sediment, microbial pathogens, phosphorous and nitrogen." As explained above, "minimise" means different things to different people and by removing the focus on efficiency and management, there are no parameters or certainty around the level to which any losses would need to be reduced to in order to be "minimised." For example, a farm that implemented significant nitrogen mitigations before the NRP reference years (such as retiring large areas of land) will have a low NRP and it might be unreasonable to expect further N reductions.
82. Accordingly, the appropriate outcome might be to manage the farming activity so that N losses are maintained at those levels. However, if a requirement to "minimise" was interpreted as everyone having to reduce discharges, there would be no recognition of this prior work or what was reasonably practicable (or the contaminants at issue or proportionality).
83. Mr Eccles and Mr Millner propose to change the word "minimise" to "manage and/or reduce." Federated Farmers considers that this is consistent with the intent of Principle 1 and provides greater certainty and fairness.
84. Another example is the deletion of the words "where agronomically appropriate" from the end of Principle 3. Federated Farmers considers that these words are appropriate to provide context and reasonable parameters around the extent to which losses are to be managed. It also provides greater certainty for farmers than a bold statement to simply "manage farming operations to minimise losses" (as I explain above, minimise could mean different things to different people).
85. Schedule 1 also proposes two new principles – Principle 9 for the NRP and Principle 13 for stock exclusion. In respect of Principle 9, Federated Farmers considers that an appropriate consenting pathway ought to be provided for farmers that cannot meet their NRP or reduce to the 75th percentile but propose appropriate alternative mitigations or demonstrate that they are not contributing to the N issue.

It would also be appropriate if only that NRP part of the activity was assessed as a restricted discretionary activity (as recommended by Mr Eccles in his Block 2 evidence or discretionary activity if the section 42A amendments are adopted).

86. In addition, Federated Farmers considers that an appropriate pathway ought to be provided for those farmers for whom the reference years would cause hardship or for whom insufficient records are available to establish a NRP. Our experience in other regions is that matters such as these, which are able to be reasonably anticipated (and have been raised by many submitters in the Block 2 hearings) ought to be provided for. If they are not provided for, Council will run into implementation issues as councils have done in other regions. This is addressed in Mr Millner's evidence.
87. Federated Farmers supports Mr Dragten's proposal that the focus is on providing confidence that the NRP is not exceeded, as opposed to using Overseer to demonstrate rigid adherence.²¹ We have experienced the difficulties in other regions of locking in a version of Overseer into a plan (Variation 5), locking in a nitrogen allocation regime into a plan based on a certain version of Overseer (Horizons One Plan) and providing a very complicated (and arguably non-representative) approach for Overseer version change using reference files (Rotorua Plan Change 10). This has created considerable uncertainty for farmers with feedback from many of our members being that they can no longer farm the land but they also cannot sell it because they do not have sufficient certainty about what that land can be used for.
88. Mr Dragten's proposal appears to be a practical response to these issues that still obtains the desired direction of travel.
89. As explained above, Federated Farmers considers that a farmer ought to be able to propose alternative mitigations to those contained in Schedule C as part of a FEP prepared under controlled activity. Therefore, we do not agree with Principle 13 (which requires compliance with Schedule C) and consider that it ought to be deleted.

Schedule 1A

90. As explained above, Federated Farmers considers that FEPs can be prepared as part of a permitted activity in accordance with Schedule 1. However, in recognition of the concerns the Panel has raised, and if the Panel was to decide that after

²¹ Page 66 of the Block 3 section 42A report.

hearing all of the evidence those concerns are not able to be overcome, Federated Farmers considers that an alternative schedule ought to be considered. This is on the basis that we see real merit in providing for a CIS as a permitted activity and we see merit in many low intensity farms obtaining FEPs as a permitted activity.

91. After hearing the concerns raised by the Hearing Panel, I asked one of my policy advisors to initiate some work on drafting a more confined schedule. This has been a very recent project over the past two weeks.
92. Following very brief discussion with several industry representatives, and review of the documents listed at paragraphs 48 and 49 above, my policy advisor prepared an initial draft of Schedule 1A. It was then circulated to several industry groups for review (but due to timeframe that was very limited). It was also reviewed and amended by Mr Millner and Mr Eccles, as explained in their evidence.
93. Federated Farmers recognises that Schedule 1A would likely benefit from wider review by industry groups, Council's implementation team and those with experience in drafting FEPs. Due to time pressures, that has not been possible. However, it is hoped that by attaching it to our evidence other parties can respond to it through rebuttal evidence. We would also welcome any conferencing or caucusing on it by suitably qualified professionals.

Conclusion

94. The focus of our Block 3 evidence is on FEPs because we consider that they are a critical aspect of PC1 and they are also an area that we have considerable experience in through our involvement in other regional plans, regional initiatives and the national GFP work.
95. Our view is that the focus ought to be on outcomes and on getting FEPs as quickly and painlessly as possible so that the focus can be directed to implementation and progress towards achieving the Vision & Strategy.
96. The merit in FEPs is in the tailored actions, which we think can be achieved through a permitted activity regime. We also consider that imposing minimum standards that are too stringent will significantly increase the cost and reduce the effectiveness and affordability of mitigations like stock exclusion.
97. In the event that the Hearing Panel concludes that Schedule 1 contains too much discretion or judgement, we consider that the Hearing Panel ought to consider all

reasonable avenues to ensure a permitted activity pathway (at least for the CIS) is provided for.



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Annexure PLM 1

Analysis of costs of fencing, setbacks and riparian planting – all livestock land in PC1 Catchment

Table 1: Length of streams, cost of fencing and areas of land in setbacks

Stream Order	River length (km)	Fencing @ \$10 p/m	1m setback ha	3m setback ha	5m setback ha	10m setback ha	15m setback ha	20 m setback ha
1	6110.6	\$122,211,803	1222	3666	6111	12221	18332	24442
2	3021.2	\$60,423,419	604	1813	3021	6042	9064	12085
3	1644.3	\$32,885,933	329	987	1644	3289	4933	6577
4	648.5	\$12,969,694	130	389	648	1297	1945	2594
5	252.0	\$5,039,573	50	151	252	504	756	1008
6	31.4	\$627,250	6	19	31	63	94	125
7	39.7	\$794,209	8	24	40	79	119	159
Total	11747.6km	\$234,951,881	2,350ha	7,049ha	11,748ha	23,495ha	35,243ha	46,990ha

Table 2: Costs and land value at 1m setback

Stream Order	River length (km)	Total riparian area at 1m setback (Ha)	Fencing @ \$10 per metre	Land value @\$20,000/ha	Riparian planting cost @\$45,000/ha	Maintenance cost years 1-3 @ \$22,000/ha total	Total cost and value of land
1	6110.6	1,222	\$122,211,803	\$24,442,361	\$54,995,311	\$26,886,597	\$228,536,072
2	3021.2	604	\$60,423,419	\$12,084,684	\$27,190,539	\$13,293,152	\$112,991,794
3	1644.3	329	\$32,885,933	\$6,577,187	\$14,798,670	\$7,234,905	\$61,496,695
4	648.5	130	\$12,969,694	\$2,593,939	\$5,836,362	\$2,853,333	\$24,253,328
5	252.0	50	\$5,039,573	\$1,007,915	\$2,267,808	\$1,108,706	\$9,424,001
6	31.4	6	\$627,250	\$125,450	\$282,262	\$137,995	\$1,172,957
7	39.7	8	\$794,209	\$158,842	\$357,394	\$174,726	\$1,485,170
Total	11747.6km	2,349.5ha	\$234,951,881	\$46,990,376	\$105,728,346	\$51,689,414	\$439,360,017

Table 3: Costs and land value at 3m setback

Stream Order	River length (km)	Total riparian area at 3m setback (Ha)	Fencing @ \$10 per metre	Land value @\$20,000/ha	Riparian planting cost @\$45,000/ha	Maintenance cost years 1-3 @ \$22,000/ha total	Total cost and value of land
1	6110.6	3,666	\$122,211,803	\$73,327,082	\$164,985,934	\$80,659,790	\$441,184,609
2	3021.2	1,813	\$60,423,419	\$36,254,052	\$81,571,616	\$39,879,457	\$218,128,544
3	1644.3	987	\$32,885,933	\$19,731,560	\$44,396,009	\$21,704,716	\$118,718,218
4	648.5	389	\$12,969,694	\$7,781,816	\$17,509,087	\$8,559,998	\$46,820,595
5	252.0	151	\$5,039,573	\$3,023,744	\$6,803,423	\$3,326,118	\$18,192,858
6	31.4	19	\$627,250	\$376,350	\$846,787	\$413,985	\$2,264,372
7	39.7	24	\$794,209	\$476,525	\$1,072,182	\$524,178	\$2,867,093
Total	11747.6km	7,048.6ha	\$234,951,881	\$140,971,128	\$317,185,039	\$155,068,241	\$848,176,290

Table 4: Costs and land value at 5m setback

Stream Order	River length (km)	Total riparian area at 5m setback (Ha)	Fencing @ \$10 per metre	Land value @\$20,000/ha	Riparian planting cost @\$45,000/ha	Maintenance cost years 1-3 @ \$22,000/ha total	Total cost and value of land
1	6110.6	6,111	\$122,211,803	\$122,211,803	\$274,976,557	\$134,432,983	\$653,833,147
2	3021.2	3,021	\$60,423,419	\$60,423,419	\$135,952,694	\$66,465,761	\$323,265,294
3	1644.3	1,644	\$32,885,933	\$32,885,933	\$73,993,349	\$36,174,526	\$175,939,741
4	648.5	648	\$12,969,694	\$12,969,694	\$29,181,811	\$14,266,663	\$69,387,863
5	252.0	252	\$5,039,573	\$5,039,573	\$11,339,039	\$5,543,530	\$26,961,715
6	31.4	31	\$627,250	\$627,250	\$1,411,312	\$689,975	\$3,355,787
7	39.7	40	\$794,209	\$794,209	\$1,786,969	\$873,629	\$4,249,016
Total	11747.6	11,747.6	\$234,951,881	\$234,951,881	\$528,641,732	\$258,447,069	\$1,256,992,562

Table 5: Costs and land value at 10m setback

Stream Order	River length (km)	Total riparian area at 10m setback (Ha)	Fencing @ \$10 per metre	Land value @\$20,000/ha	Riparian planting cost @\$45,000/ha	Maintenance cost years 1-3 @ \$22,000/ha total	Total cost and value of land
1	6110.6	12,221	\$122,211,803	\$244,423,606	\$549,953,114	\$268,865,967	\$1,185,454,490
2	3021.2	6,042	\$60,423,419	\$120,846,839	\$271,905,387	\$132,931,523	\$586,107,168
3	1644.3	3,289	\$32,885,933	\$65,771,866	\$147,986,698	\$72,349,052	\$318,993,549
4	648.5	1,297	\$12,969,694	\$25,939,388	\$58,363,623	\$28,533,327	\$125,806,032
5	252.0	504	\$5,039,573	\$10,079,146	\$22,678,078	\$11,087,060	\$48,883,857
6	31.4	63	\$627,250	\$1,254,500	\$2,822,624	\$1,379,950	\$6,084,324
7	39.7	79	\$794,209	\$1,588,417	\$3,573,938	\$1,747,259	\$7,703,823
Total	11747.6	23,495.2	\$234,951,881	\$469,903,762	\$1,057,283,463	\$516,894,138	\$2,279,033,243

Table 6: Costs and land value at 15m setback

Stream Order	River length (km)	Total riparian area at 15m setback (Ha)	Fencing @ \$10 per metre	Land value @\$20,000/ha	Riparian planting cost @\$45,000/ha	Maintenance cost years 1-3 @ \$22,000/ha total	Total cost and value of land
1	6110.6	18,332	\$122,211,803	\$366,635,409	\$824,929,671	\$403,298,950	\$1,717,075,834
2	3021.2	9,064	\$60,423,419	\$181,270,258	\$407,858,081	\$199,397,284	\$848,949,043
3	1644.3	4,933	\$32,885,933	\$98,657,799	\$221,980,047	\$108,523,579	\$462,047,357
4	648.5	1,945	\$12,969,694	\$38,909,082	\$87,545,434	\$42,799,990	\$182,224,201
5	252.0	756	\$5,039,573	\$15,118,719	\$34,017,117	\$16,630,591	\$70,806,000
6	31.4	94	\$627,250	\$1,881,750	\$4,233,937	\$2,069,925	\$8,812,861
7	39.7	119	\$794,209	\$2,382,626	\$5,360,908	\$2,620,888	\$11,158,630
Total	11747.6	35,242.8	\$234,951,881	\$704,855,642	\$1,585,925,195	\$775,341,207	\$3,301,073,925

Table 7: Costs and land value at 20m setback

Stream Order	River length (km)	Total riparian area at 20m setback (Ha)	Fencing @ \$10 per metre	Land value @\$20,000/ha	Riparian planting cost @\$45,000/ha	Maintenance cost years 1-3 @ \$22,000/ha total	Total cost and value of land
1	6110.6	24,442	\$122,211,803	\$488,847,212	\$1,099,906,228	\$537,731,934	\$2,248,697,177
2	3021.2	12,085	\$60,423,419	\$241,693,678	\$543,810,775	\$265,863,045	\$1,111,790,917
3	1644.3	6,577	\$32,885,933	\$131,543,732	\$295,973,396	\$144,698,105	\$605,101,165
4	648.5	2,594	\$12,969,694	\$51,878,776	\$116,727,246	\$57,066,654	\$238,642,369
5	252.0	1,008	\$5,039,573	\$20,158,292	\$45,356,156	\$22,174,121	\$92,728,142
6	31.4	125	\$627,250	\$2,509,000	\$5,645,249	\$2,759,899	\$11,541,398
7	39.7	159	\$794,209	\$3,176,834	\$7,147,877	\$3,494,518	\$14,613,437
Total	11747.6	46,990.4	\$234,951,881	\$939,807,523	\$2,114,566,927	\$1,033,788,275	\$4,323,114,606

Table 8: Intermittent and permanent waterways on Mr Millner Case Study 2 farm and four Hill Country Farmers' case study farms

Farm	Type ¹	Size (ha) ²	FMU	Stream order layer (km)						Additional: Intermittent & perennial streams	Total: stream order + additional	Additional streams as % of stream order
				1	2	3	4	5	Total			
Mr Millner's farm 2	DAI + SNB	368	Waipa	1.9	1.7	0	1.2	0.4	5.2	10.4	15.6	200%
Farm A (HCFG)	SNB	514	Lower Waikato	5.1	1.0	1.3	0	0	7.4	14.2	21.6	192%
Farm B (HCFG)	SNB	370	Lower Waikato	2.9	0.7	5.0	0	0	8.6	6.3	14.9	73%
Farm C (HCFG)	SNB	1,064	Lower Waikato	9.7	5.1	1.0	0.2	0	16.0	16.7	32.7	104%
Farm D (HCFG)	SNB	622	Lower Waikato	5.3	2.0	2.9	0	0	10.2	5.5	15.7	54%
Farm E (HCFG)	SNB	89	Lower Waikato	1.8	0.7	0	0	0	2.5	1.5	4.0	60%

¹ Based on Agribase, except for Farm E, which is not in Agribase so data taken from Page 7 of Baker Ag report – page 34 of this evidence - <https://www.waikatoregion.govt.nz/assets/WRC/Council/Policy-and-Plans/HR/43.pdf>

² Based on Agribase, except for Farm E, which is not in Agribase so data taken from Page 7 of Baker Ag report – page 34 of this evidence - <https://www.waikatoregion.govt.nz/assets/WRC/Council/Policy-and-Plans/HR/43.pdf>

Annexure PLM 2

Analysis of costs of fencing, setbacks and riparian planting in PC1 Catchment – drystock land only

Table 1: Length of streams, cost of fencing and areas of land in setbacks - drystock Land only

Stream Order	River length (km)	Fencing @ \$15 per metre	1 m setback ha	3 m setback ha	5 m setback ha	10 m setback ha	15 m setback ha	20 m setback ha
1	2568.4	\$77,051,371	514	1541	2568	5137	7705	10274
2	1181.7	\$35,451,545	236	709	1182	2363	3545	4727
3	628.3	\$18,848,668	126	377	628	1257	1885	2513
4	234.7	\$7,041,797	47	141	235	469	704	939
5	81.7	\$2,451,307	16	49	82	163	245	327
6	11.6	\$347,417	2	7	12	23	35	46
7	6.1	\$182,864	1	4	6	12	18	24
Total	4,712.5km	\$141,374,969	942ha	2,827ha	4,712ha	9,425ha	14,137ha	18,850ha

Table 2: Costs and land value at 1m setback - drystock land only

Stream Order	River length (km)	Total riparian area at 1m setback (Ha)	Fencing @ \$15 per metre	Land value @\$15,000/ha	Riparian planting cost @\$45,000/ha	Maintenance cost years 1-3 @ \$22,000/ha total	Total cost and value of land
1	2568.4	514	\$77,051,371	\$7,705,137	\$23,115,411	\$11,300,868	\$119,172,787
2	1181.7	236	\$35,451,545	\$3,545,155	\$10,635,464	\$5,199,560	\$54,831,723
3	628.3	126	\$18,848,668	\$1,884,867	\$5,654,600	\$2,764,471	\$29,152,607
4	234.7	47	\$7,041,797	\$704,180	\$2,112,539	\$1,032,797	\$10,891,313
5	81.7	16	\$2,451,307	\$245,131	\$735,392	\$359,525	\$3,791,355
6	11.6	2	\$347,417	\$34,742	\$104,225	\$50,955	\$537,338
7	6.1	1	\$182,864	\$18,286	\$54,859	\$26,820	\$282,829
Total	4712.5km	942.5ha	\$141,374,969	\$14,137,497	\$42,412,491	\$20,734,996	\$218,659,953

Table 3: Costs and land value at 3m setback - drystock land only

Stream Order	River length (km)	Total riparian area at 3m setback (Ha)	Fencing @ \$15 per metre	Land value @\$15,000/ha	Riparian planting cost @\$45,000/ha	Maintenance cost years 1-3 @ \$22,000/ha total	Total cost and value of land
1	2568.4	1,541	\$77,051,371	\$23,115,411	\$69,346,234	\$33,902,603	\$203,415,620
2	1181.7	709	\$35,451,545	\$10,635,464	\$31,906,391	\$15,598,680	\$93,592,080
3	628.3	377	\$18,848,668	\$5,654,600	\$16,963,801	\$8,293,414	\$49,760,484
4	234.7	141	\$7,041,797	\$2,112,539	\$6,337,617	\$3,098,391	\$18,590,345
5	81.7	49	\$2,451,307	\$735,392	\$2,206,176	\$1,078,575	\$6,471,450
6	11.6	7	\$347,417	\$104,225	\$312,675	\$152,864	\$917,181
7	6.1	4	\$182,864	\$54,859	\$164,577	\$80,460	\$482,760
Total	4712.5km	2,827.5ha	\$141,374,969	\$42,412,491	\$127,237,473	\$62,204,987	\$373,229,919

Table 4: Costs and land value at 5m setback - drystock land only

Stream Order	River length (km)	Total riparian area at 5m setback (Ha)	Fencing @ \$15 per metre	Land value @\$15,000/ha	Riparian planting cost @\$45,000/ha	Maintenance cost years 1-3 @ \$22,000/ha total	Total cost and value of land
1	2568.4	2,568	\$77,051,371	\$38,525,686	\$115,577,057	\$56,504,339	\$287,658,452
2	1181.7	1,182	\$35,451,545	\$17,725,773	\$53,177,318	\$25,997,800	\$132,352,436
3	628.3	628	\$18,848,668	\$9,424,334	\$28,273,002	\$13,822,357	\$70,368,362
4	234.7	235	\$7,041,797	\$3,520,899	\$10,562,696	\$5,163,985	\$26,289,376
5	81.7	82	\$2,451,307	\$1,225,653	\$3,676,960	\$1,797,625	\$9,151,546
6	11.6	12	\$347,417	\$173,709	\$521,126	\$254,773	\$1,297,024
7	6.1	6	\$182,864	\$91,432	\$274,295	\$134,100	\$682,691
Total	4712.5km	4,712.5ha	\$141,374,969	\$70,687,485	\$212,062,454	\$103,674,978	\$527,799,886

Table 5: Costs and land value at 10m setback - drystock land only

Stream Order	River length (km)	Total riparian area at 10m setback (Ha)	Fencing @ \$15 per metre	Land value @\$15,000/ha	Riparian planting cost @\$45,000/ha	Maintenance cost years 1-3 @ \$22,000/ha total	Total cost and value of land
1	2568.4	5,137	\$77,051,371	\$77,051,371	\$231,154,113	\$113,008,678	498,265,533
2	1181.7	2,363	\$35,451,545	\$35,451,545	\$106,354,636	\$51,995,600	229,253,326
3	628.3	1,257	\$18,848,668	\$18,848,668	\$56,546,005	\$27,644,714	121,888,055
4	234.7	469	\$7,041,797	\$7,041,797	\$21,125,392	\$10,327,969	\$45,536,955
5	81.7	163	\$2,451,307	\$2,451,307	\$7,353,921	\$3,595,250	\$15,851,784
6	11.6	23	\$347,417	\$347,417	\$1,042,251	\$509,545	\$2,246,630
7	6.1	12	\$182,864	\$182,864	\$548,591	\$268,200	\$1,182,518
Total	4712.5km	9,425.0ha	\$141,374,969	\$141,374,969	\$424,124,908	\$207,349,955	\$914,224,803

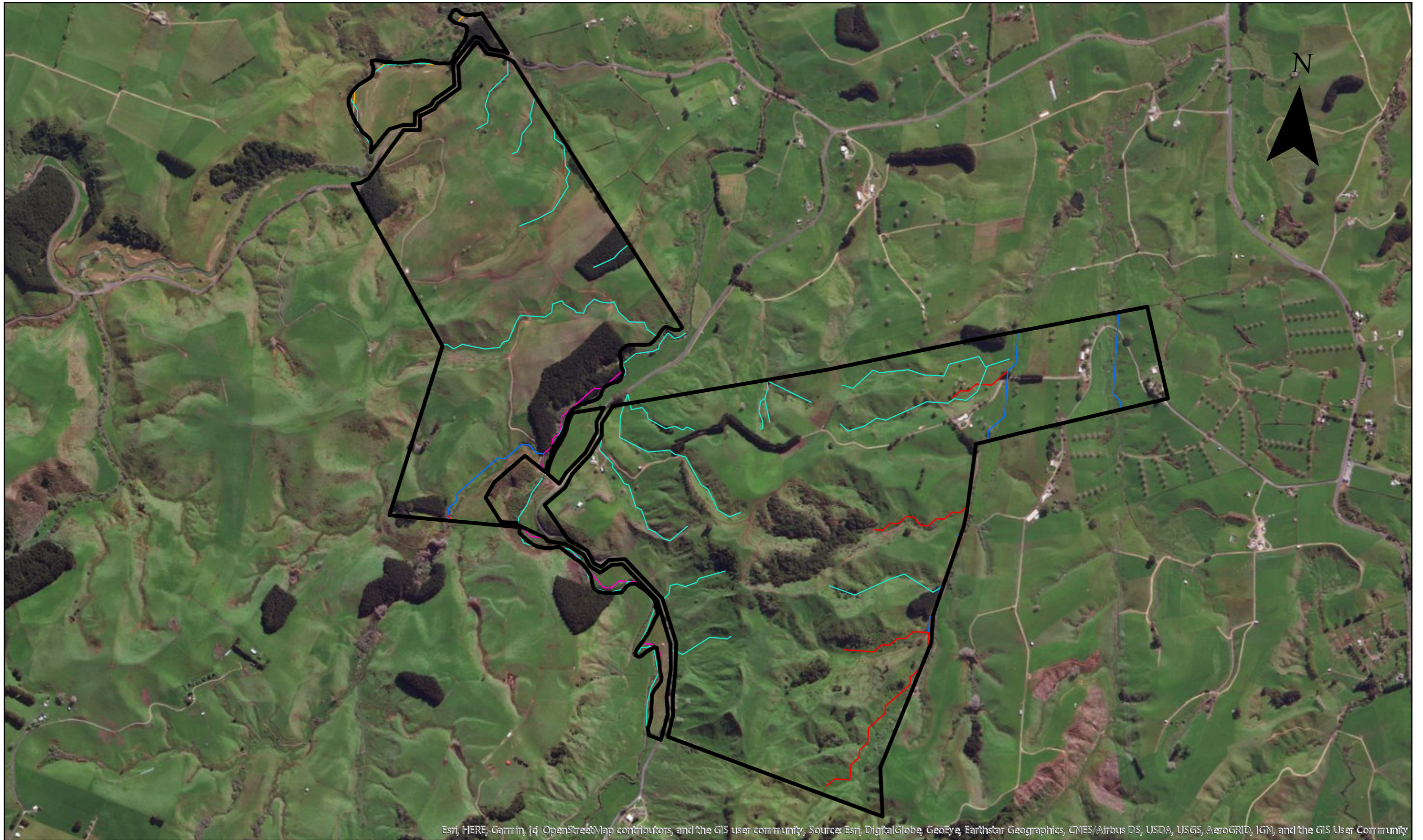
Table 6: Costs and land value at 15m setback - drystock land only

Stream Order	River length (km)	Total riparian area at 15m setback (Ha)	Fencing @ \$15 per metre	Land value @\$15,000/ha	Riparian planting cost @\$45,000/ha	Maintenance cost years 1-3 @ \$22,000/ha total	Total cost and value of land
1	2568.4	7,705	\$77,051,371	\$115,577,057	\$346,731,170	\$169,513,016	\$708,872,614
2	1181.7	3,545	\$35,451,545	\$53,177,318	\$159,531,954	\$77,993,400	\$326,154,217
3	628.3	1,885	\$18,848,668	\$28,273,002	\$84,819,007	\$41,467,070	\$173,407,749
4	234.7	704	\$7,041,797	\$10,562,696	\$31,688,087	\$15,491,954	\$64,784,534
5	81.7	245	\$2,451,307	\$3,676,960	\$11,030,881	\$5,392,875	\$22,552,023
6	11.6	35	\$347,417	\$521,126	\$1,563,377	\$764,318	\$3,196,237
7	6.1	18	\$182,864	\$274,295	\$822,886	\$402,300	\$1,682,345
Total	4712.5km	14,137.5ha	\$141,374,969	\$212,062,454	\$636,187,363	\$311,024,933	\$1,300,649,719

Table 7: Costs and land value at 20m setback – drystock land only

Stream Order	River length (km)	Total riparian area at 20m setback (Ha)	Fencing @ \$15 per metre	Land value @\$15,000/ha	Riparian planting cost @\$45,000/ha	Maintenance cost years 1-3 @ \$22,000/ha total	Total cost and value of land
1	2568.4	10,274	\$77,051,371	\$154,102,742	\$462,308,227	\$226,017,355	\$919,479,695
2	1181.7	4,727	\$35,451,545	\$70,903,091	\$212,709,272	\$103,991,200	\$423,055,108
3	628.3	2,513	\$18,848,668	\$37,697,337	\$113,092,010	\$55,289,427	\$224,927,442
4	234.7	939	\$7,041,797	\$14,083,594	\$42,250,783	\$20,655,938	\$84,032,113
5	81.7	327	\$2,451,307	\$4,902,614	\$14,707,841	\$7,190,500	\$29,252,262
6	11.6	46	\$347,417	\$694,834	\$2,084,502	\$1,019,090	\$4,145,843
7	6.1	24	\$182,864	\$365,727	\$1,097,182	\$536,400	\$2,182,173
Total	4712.5m	18,850.0ha	\$141,374,969	\$282,749,939	\$848,249,817	\$414,699,910	\$1,687,074,636

Annexure PLM 3

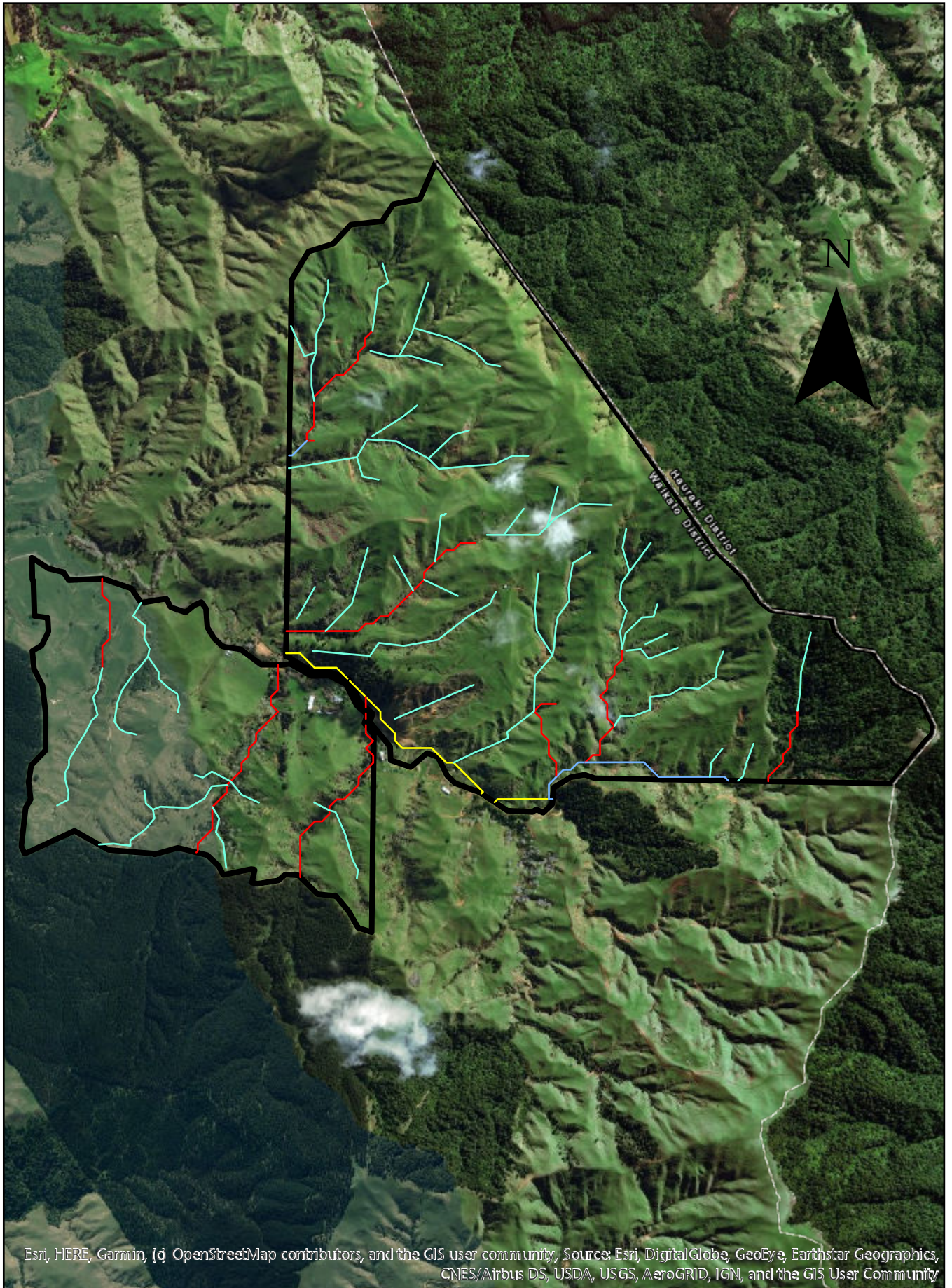


Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community, Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

0 0.13 0.25 0.5 Kilometers

- | | |
|---------------------------------|-------------------------------|
| Mr. Milner's Farm 2 | Farm 2 - Stream Orders |
| Perennial waterways - 3.2 km | 1 - 1.9 km |
| Intermittent waterways - 7.2 km | 2 - 1.7 km |
| | 5 - 0.4 km |



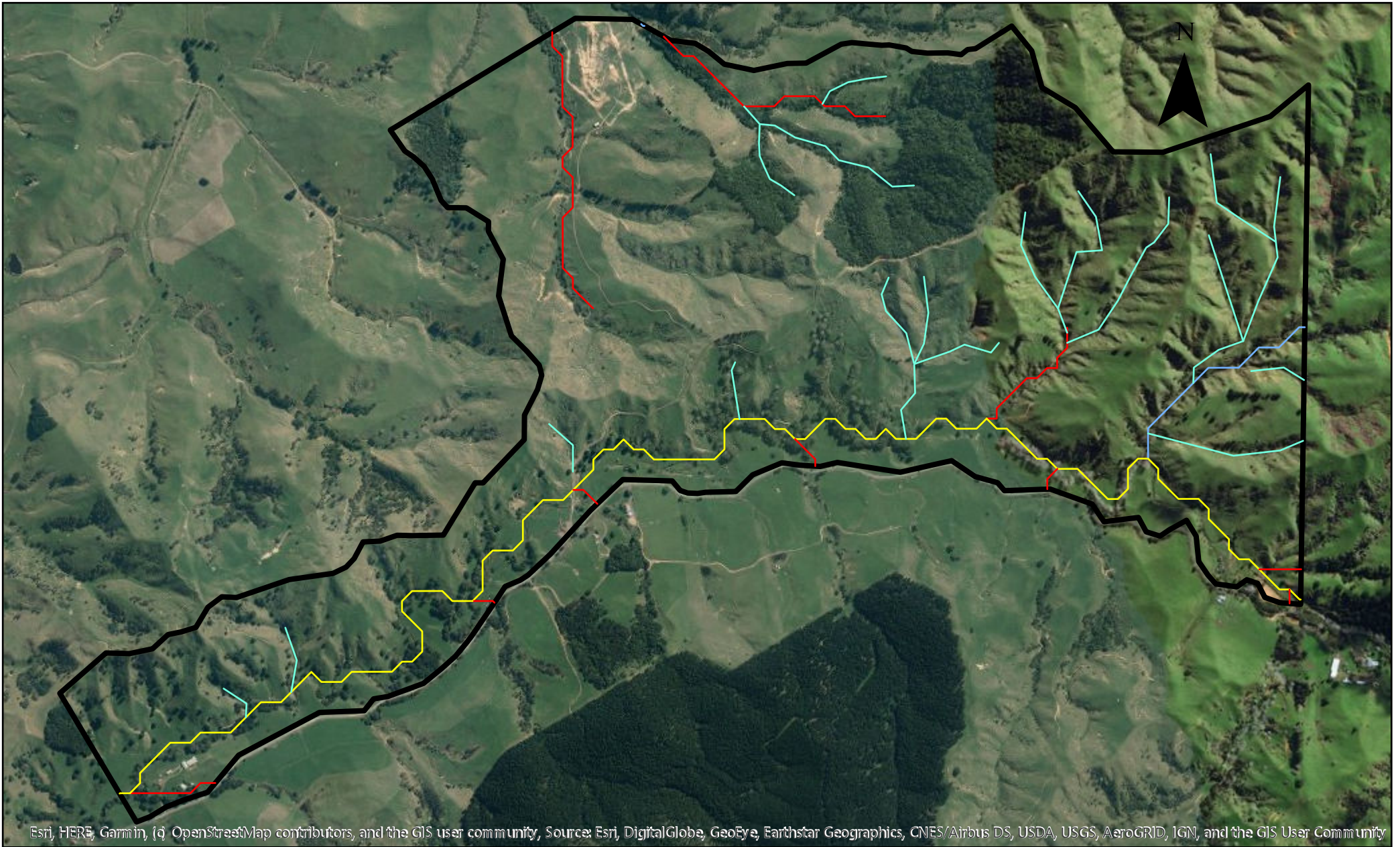


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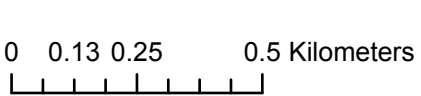
0 0.1 0.25 0.5 Kilometers

- Farm A
- Farm A - Stream orders
- 1 - 5.1 km
- 2 - 1.0 km
- 3 - 1.3 km
- Streams (perennial & intermittent) ID'd by H.C.F.G 14.2 km





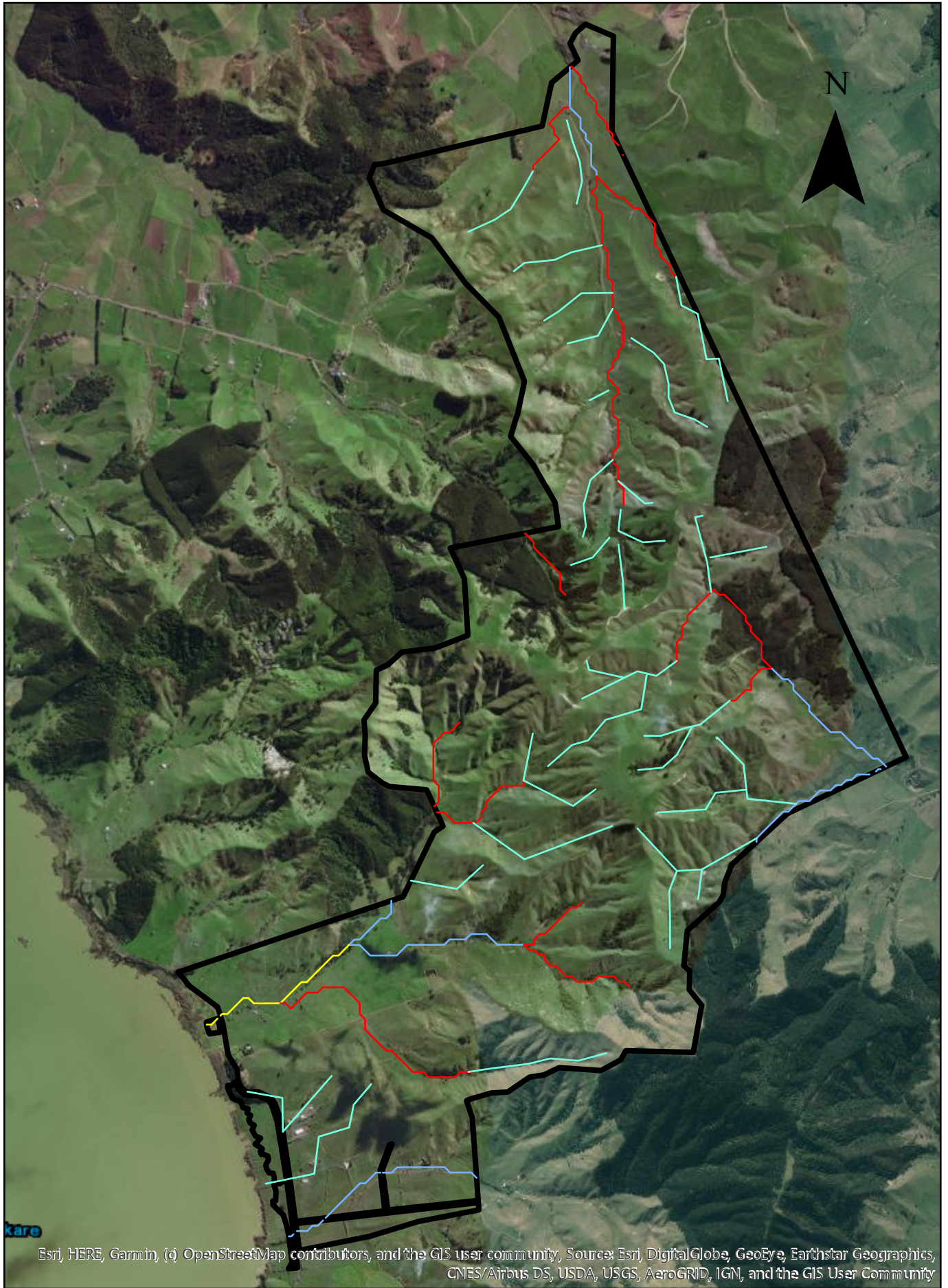
Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community, Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



█ Farm B
Streams (perennial & intermittent) ID'd by H.C.F.G. 6.3 km

Farm B - Stream orders
1 - 2.9 km
2 - 0.7 km
3 - 5.0 km

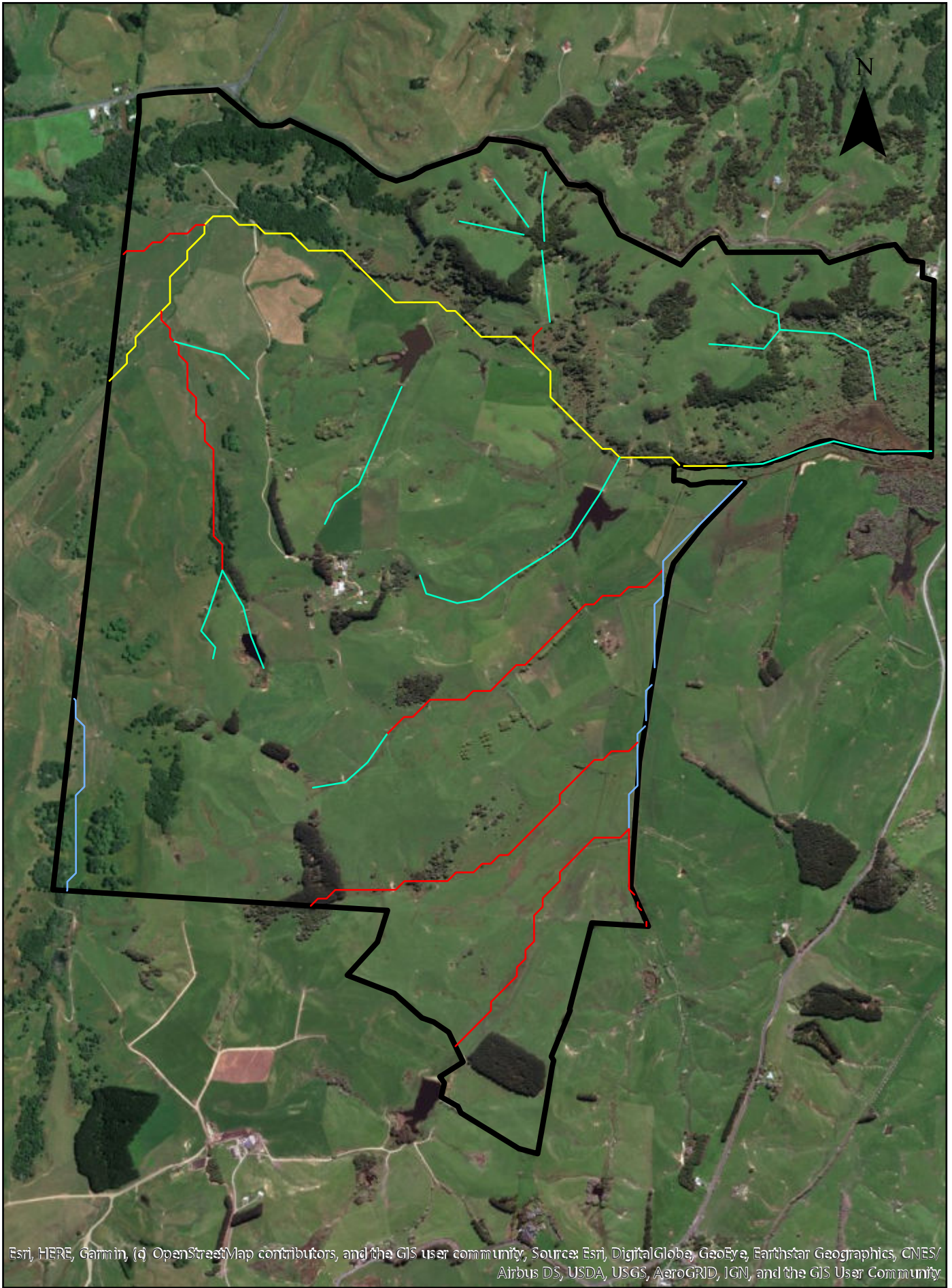




0.1 0.25 0.5 Kilometers

- Farm C
- Streams (perennial & intermittent) ID'd by H.C.F.G. 16.7 km
- Farm C - Stream orders**
- 1 - 9.7 km
- 2 - 5.1 km
- 3 - 1.0 km

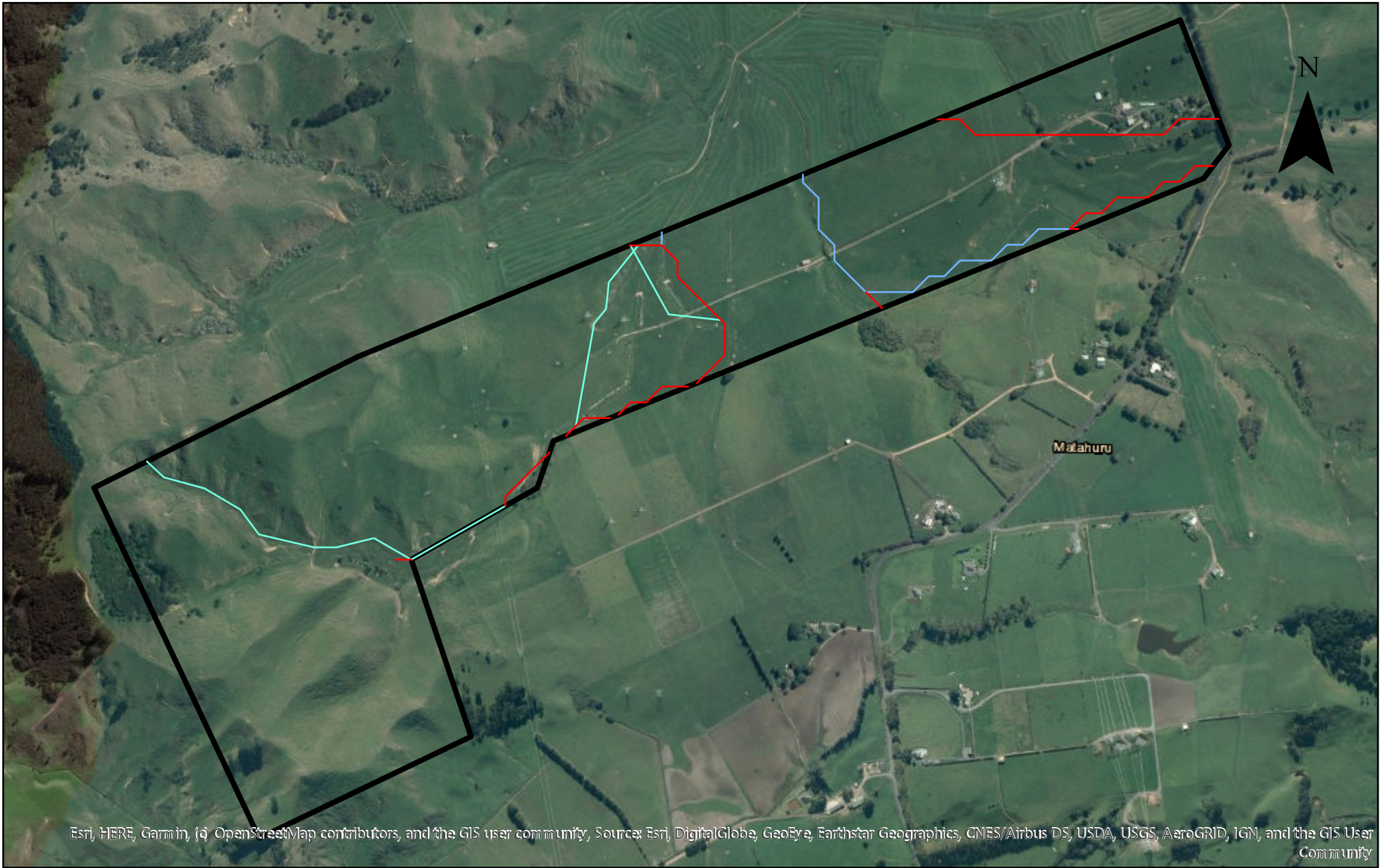




0 0.130.25 0.5 Kilometers

- Farm D
- Streams (perennial & intermittent) ID'd by H.C.F.G. 5.3 km
- Farm D - Stream orders**
- 1 - 5.3 km
- 2 - 2.0 km
- 3 - 2.9 km





0 0.13 0.25 0.5 Kilometers

 Farm E

 Streams (perennial & intermittent) ID'd by H.C.F.G. 1.5 km

Farm E - Stream Orders

 1 - 1.8 km

 2 - 0.7 km





GOOD FARMING PRACTICE

ACTION PLAN FOR WATER QUALITY 2018

The Action Plan

The agricultural and horticultural sectors are committed to swimmable rivers and improving the ecological health of our waterways. The widespread adoption of Good Farming Practice alongside greater collaboration between sectors, Regional Councils and central government, will allow improved water quality to be achieved faster.



Good Farming Practice Governance Group members:

Chris Allen—*Federated Farmers*

Sam McIvor—*Beef + Lamb New Zealand (B+LNZ)*

Nigel Corry—*Greater Wellington Regional Council*

Tim Mackle, Rick Pridmore and David Burger—*DairyNZ*

Chris McLay—*Waikato Regional Council*

Mike Chapman—*Horticulture New Zealand*

Roger Bannister—*Water Directorate, Ministry for the Environment*

Andrew Curtis—*Irrigation New Zealand*

Martin Workman—*Water Directorate, Ministry for the Environment*

Nadeine Dommissé—*ECan*

This Action Plan was developed by a Governance Group composed of senior representatives of the primary sectors, regional councils and the Water Directorate (Ministries for the Environment and Primary Industries).

The Action Plan is a voluntary commitment, whose purpose is to accelerate the uptake of good farming practices for water quality (primarily) and quantity outcomes, to measure and demonstrate this uptake, to assess the impact and benefit of those farming practices, and to communicate progress to the wider public. The Governance Group is committed to supporting positive behaviour change and adopting an approach of continual improvement in these critical areas.



Ministry for Primary Industries
Manatū Ahu Matua



Regional Councils, as members of the Governance Group, and supported by the Regional Council sector, are committed to working with Industry to deliver the Action Plan.

To achieve this we commit to the following actions and time-frames:

Action	Time-frame	Who will be involved?
Refresh the Industry Agreed Good Management Practices for Water Quality and revise to National Good Farming Practice Principles	Complete	Governance Group with support from the Land and Water Partnership ¹ and Regional Council Land Management Officers
Develop systems and tools for monitoring and reporting on Good Farming Practice uptake	2018-2020	Sectors, councils, Water Directorate, and other interested parties
Identifying priority principles to apply for a region, catchment and/or sector to support the uptake of targeted Good Farming Practice	2018-2020	Sectors, councils and other interested parties e.g. community-based, commercial agribusiness, rural professionals
Supporting every farm and horticultural property to have assessed risks against priority principles for catchment/sector and developed their response actions (farm plan)	Milestones to be developed, with priority catchments and sectors completed first 2018-2030	Sectors, councils and rural professionals
Accelerating uptake through sector and council extension programmes and share learnings	2018-2020	Sectors, councils, Water Directorate, and other interested parties
Communicate progress on farming practice to communities, councils, central government	Ongoing	Sectors
Strengthen and validate support systems and tools to: <ul style="list-style-type: none"> • Improve and expand training and certification for consultants, council Land Management Officers, auditors • Ensure a database for monitoring and reporting • Promote harmonisation of approaches across New Zealand 	2018-2020	Councils, sectors, Water Directorate, other government agencies e.g. Tertiary Education Commission
Update the Good Farming Practices Action Plan	2020	Sectors, councils, central government, ENGO's, iwi organisations and other interested parties

¹A pan-sector primary industry group

Through these actions, the Action Plan will deliver the following outcomes:

- Well-informed and competent land users using Good Farming Practices successfully to improve rural water outcomes at the farm level arising from their activities
- Sectors able to articulate and demonstrate their water stewardship story
- Councils and communities confident that land users are using Good Farming Practices to improve water outcomes.

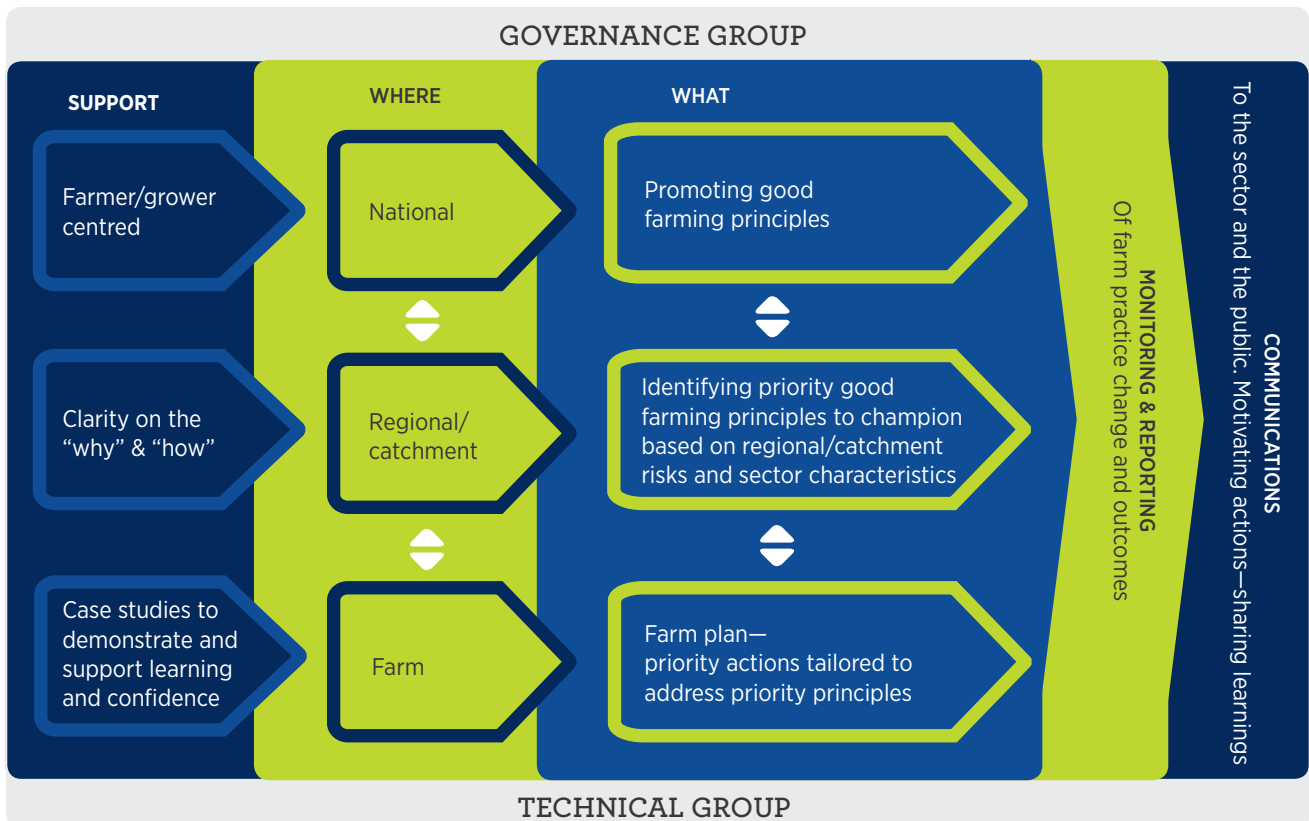
Good Farming Practices are an evolving suite of practical measures that can be put in place at a land user, sector and industry level to assist in achieving community agreed outcomes.

The Action Plan envisages a system that responds rapidly to feedback, new insights and understanding, incorporating learnings as programmes develop over time.

The Action Plan Approach detailed below, builds on the 2015 Industry Agreed Good Management Practices for Water Quality.

These 21 Agreed National Good Farming Practice Principles (detailed on page 4) were developed with input from farmers to ensure they are practical and achievable.

While the Action Plan is focussed primarily on water quality, promoting efficient water use (e.g. through initiatives like Dairy NZ’s Smart Water Use on Farms to reduce water use) is also important.



Promoting good farming practices

At the national level, the Governance Group will promote the Good Farming Practice Principles outlined below.

AGREED NATIONAL GOOD FARMING PRACTICE PRINCIPLES

GENERAL PRINCIPLES

1. Identify the physical and biophysical characteristics of the farm system, assess the risk factors to water quality associated with the farm system, and manage appropriately.
2. Maintain accurate and auditable records of annual farm inputs, outputs and management practices.
3. Manage farming operations to minimise direct and indirect losses of sediment and nutrients to water, and maintain or enhance soil structure, where agronomically appropriate.

NUTRIENTS

4. Monitor soil phosphorus levels and maintain them at or below the agronomic optimum for the farm system
5. Manage the amount and timing of fertiliser inputs, taking account of all sources of nutrients, to match plant requirements and minimise risk of losses.
6. Store and load fertiliser to minimise risk of spillage, leaching and loss into water bodies
7. Ensure equipment for spreading fertilisers is well maintained and calibrated.
8. Store, transport and distribute feed to minimise wastage, leachate and soil damage.

WATERWAYS

9. Identify risk of overland flow of sediment and faecal bacteria on the property and implement measures to minimise transport of these to water bodies.
10. Locate and manage farm tracks, gateways, water troughs, self-feeding areas, stock camps, wallows and other sources of run-off to minimise risks to water quality.
11. Exclude stock from water bodies to the extent that is compatible with land form, stock class and stock intensity. Where exclusion is not possible, mitigate impacts on waterways.

LAND AND SOIL

12. Manage periods of exposed soil between crops/pasture to reduce risk of erosion, overland flow and leaching.
13. Manage or retire erosion prone land to minimise soil losses through appropriate measures and practices*
14. Select appropriate paddocks for intensive grazing, recognising and mitigating possible nutrient and sediment loss from critical source areas
15. Manage grazing to minimise losses from critical source areas.

EFFLUENT

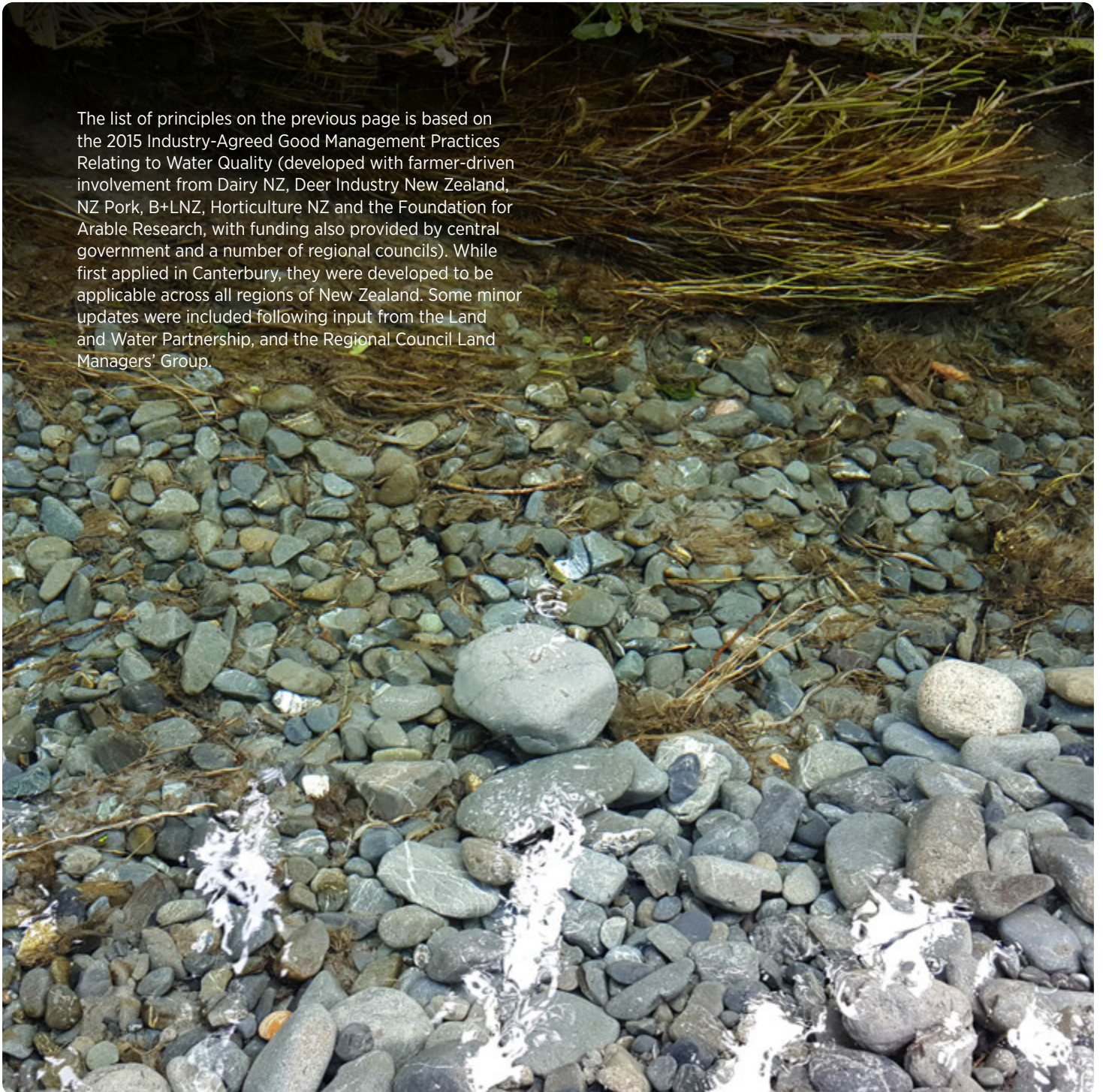
16. Ensure the effluent system meets industry specific Code of Practice or equivalent standard.
17. Have sufficient, suitable storage available for farm effluent and wastewater.
18. Ensure equipment for spreading effluent and other organic manures is well maintained and calibrated.
19. Apply effluent to pasture and crops at depths, rates and times to match plant requirements and minimise risk to water bodies.

WATER AND IRRIGATION

20. Manage the amount and timing of irrigation inputs to meet plant demands and minimise risk of leaching and runoff.
21. Design, check and operate irrigation systems to minimise the amount of water needed to meet production objectives.

**Implementing this principle may mean that Class 8 land is not actively farmed for arable, pastoral or commercial forestry uses as this land is generally unsuitable for these activities as described in the Land Use Capability Handbook.*

The list of principles on the previous page is based on the 2015 Industry-Agreed Good Management Practices Relating to Water Quality (developed with farmer-driven involvement from Dairy NZ, Deer Industry New Zealand, NZ Pork, B+LNZ, Horticulture NZ and the Foundation for Arable Research, with funding also provided by central government and a number of regional councils). While first applied in Canterbury, they were developed to be applicable across all regions of New Zealand. Some minor updates were included following input from the Land and Water Partnership, and the Regional Council Land Managers' Group.



Identifying priority principles for regions/catchments

For each region, the set of principles are narrowed to those that are a priority in that region. Identifying the priority good farming practice principles to champion in a region is a critical step. Where significant regional variation exists, priority principles will be identified at a catchment or sub-catchment level.

The priority principles will be decided based on the most pressing water quality issues in the region/catchment and considering their causes, the range of solutions and likely impacts of practice change.

Some principles may only be considered as potential priorities for some sectors e.g. the effluent principles are largely relevant only for the dairy sector

The priority good farming practice principles for a region will be identified in a co-created way with leadership from both regional councils and the farming sectors, and opportunity for input from other interested parties. Sectors may lead the identification of priority principles for their sector in each region but will work with the relevant regional council to make sure that there is agreement that the right principles are being identified. It will be important to give confidence to both the regional council and the wider community that the approach being taken will help address the priority water quality issues.

The Governance Group's intention is that this process will be done without delay, with a focus on getting practice change actions in place quickly. The approach will need to be reviewed and adapted over time **to ensure the desired** improvements are being delivered.



Identifying actions in a farm plan

At the farm/property level, risks to water will then be identified based on the nature of the business and the priorities for the catchment. A farm plan will be developed to identify practical, targeted actions to deliver on the relevant priority principles. These actions will be monitored and reported on.

Where the regional regulatory framework requires a farm plan, the documented risks and actions will need to align with regulatory requirements such as approved farm plan templates. In areas where farm plans are not required, the form of the document can be shaped to meet the needs of the farm, farmer or sector, to support good farming practice implementation.

The process of discussing and identifying priority principles will include identifying the tools and solutions available in the local area to support farmers and growers to improve water quality outcomes through farmer-driven actions. This includes existing programmes and extension support.

Training and extension support will be needed at national, regional and farm levels to increase capability and to ensure consistency. Ongoing communication will be required within the primary sectors and to the wider public, to demonstrate and verify good water stewardship. Case studies will provide grounded demonstrations.



Scenario: applying the approach

Below is a high-level, hypothetical example of how a farm plan might look for two different farm enterprises using the process to identify priority principles for a catchment (for illustration only).



SHEEP AND BEEF FARM— EAST COAST OF NORTH ISLAND

Critical water quality issues for the catchment.

Erosion—sediment, phosphorous, *E. coli*.

Does the regional council require a Farm Environment Plan (or equivalent)?

No (note that some East Coast North Island catchments require a farm plan).

Priority principles identified from page 4, led by Regional Council and the sectors.

Selected principles from the “waterways” (#9-11), “land and soil” (#12-15) and “nutrient” (#4-8) subcategories likely to be prominent. “Effluent” (#16-19) and “irrigation” (#20-21) principles unlikely to be a priority.

Discussion of locally available tools, resources and support to help farmers and growers improve practices

Actions included in a farm plan.

Sheep and beef farmer assisted to prepare farm plan that includes 3-5 priority actions targeted to meet an identified subset of those principles. For example, one action could be targeted to principle #13, with the farmer setting out steps he/she will take to retire and actively manage their erosion prone land.

Monitoring and reporting of implementation of farm plan actions



DAIRY FARM— EAST COAST OF SOUTH ISLAND

Critical water quality issues for the catchment.

Nitrates, *E. coli*.

Does the regional council require a Farm Environment Plan (or equivalent)?

Yes.

Priority principles identified from page 4, led by Regional Council and the sectors.

Selected principles from “nutrients” (#4-8), “waterways” (#9-11), and “irrigation” (#20-21) categories likely to be prominent. “Effluent” (#16-19)—these principles may be lower priority if they are already being addressed by existing programmes.

Discussion of locally available tools, resources and support to help farmers and growers improve practices

Actions included in a farm plan.

Dairy farmer assisted to prepare a farm plan that includes 3-5 priority actions targeted to meet an identified subset of those principles, as well as meeting any industry or council requirements, including compliance, with any agreed templates. For example, the farmer could identify irrigation principles (#20-21) as critical to focus on and be assisted to identify an action/s to improve performance.

Monitoring and reporting of implementation of farm plan actions

Building on successful initiatives

The Action Plan's approach is founded on existing successful initiatives that can be built on to achieve greater uptake and reporting of good practice, as set out below, with further details in the examples (see page 12).



Farm Plans to target farm-specific sources of contaminants. For example:

- Horizons Regional Council's Sustainable Land Use Initiative
- DairyNZ's Sustainable Milk Plans
- B+LNZ's Land and Environment Plans



Support for practice change. For example:

- Dairy sector's *Sustainable Dairying: Water Accord*
- *Pathway for the Pomahaka* catchment initiative
- Wharekopae Water Quality Improvement Project
- Irrigation NZ's SMART irrigation initiative



Accreditation, monitoring and reporting. For example:

- Horticulture sector's Good Agricultural Practice programmes
- Processor programmes, e.g. Fonterra's *Tiaki*, Synlait's *Lead with Pride*, Miraka's *Te Ara Miraka*, Alliance Group's environmental activities

Monitoring and reporting

The Governance Group intends to report on progress in implementing the Action Plan each year.

Leading work on developing systems and tools for monitoring and reporting on good farming practice uptake will be a significant focus for the Governance Group over the next two years (2018-2020). This will include identifying the nature of data that needs to be collected and ways to report progress at catchment, regional and national levels.

The monitoring and reporting system needs to be credible. To avoid unnecessary costs, duplication and bureaucracy, it will be important to building on existing systems where possible.



Our approach

- We are building on the Land and Water Forum's recommended approach to good management practice, including use of the Industry Agreed Good Management Practices for Water, use of farm plans, and taking a risk-based approach that targets actions at a local level to address priority water quality issues.
- We recognise and want to build on the many existing initiatives already contributing to improving water quality and quantity management (e.g. see page 9).
- Where gaps are identified, we will work collectively to address these, including through collaboration with respect to research and development.
- We support farmer-driven catchment-based approaches that seek to engage and work with communities, iwi, and a wide range of interested parties.
- We will use adaptive methods, by testing what we are doing, sharing what we are learning and improving as we go.
- We will respond rapidly to what we learn and implement these learnings to improve outcomes.
- We will report to Ministers and the public on progress annually.
- We are taking a practical approach, focusing on what works for achieving practice change on the ground to deliver outcomes quickly.
- We are drawing on the best information as to what motivates good farming practice uptake.
- We will look for opportunities to take a holistic approach that also considers the influence of other drivers such as greenhouse gas emissions, biodiversity, and business outcomes.
- We will work with partners to implement the Action Plan, for example, environmental non-government organisations, the Federation of Maori Authorities, processors, marketers and the banking sector.
- We will work with like-minded groups to support a coordinated national approach to improving water quality.

Good farming project part of the solution

We recognise that in some catchments, measures beyond good farming practice will be required, e.g. catchment scale mitigations or large-scale land use change. These measures are not the focus of this Action Plan, and the Action Plan does not cover all the land-based primary sectors. We are committed to working with communities to improve water quality.



There is complementary work underway to identify and increase uptake of urban good practice for water quality and quantity management.

Examples of successful practice change, monitoring and reporting initiatives

Sustainable land use initiative

This farm plan-based programme was initiated by Horizons Regional Council in 2005/6 in response to serious erosion and flooding in a 2004 storm. It targets highly erodible land for afforestation or space planting with poplar poles. Farm plans are in place on 669 farms in the target areas, covering 500,942 ha. Over 13.7 million trees have been planted as forests and 165,900 poles planted to reduce the risk of erosion and downstream flooding, along with 850 km of new fencing.

Landcare Research SedNetNZ modelling indicates that around 12% less sediment is generated on works completed to date, with over 27% reduction when work is complete. In target catchments, the model indicates up to 60% sediment reduction. Evaluation of the initiative has indicated a strong perception from farmers that the scheme has had a major impact on environmental and economic sustainability (AgResearch 2016 report to Horizons Regional Council).

Pathway for the Pomahaka farmer-led catchment initiative

The Pomahaka catchment in South & West Otago is one of a growing number of successful farmer-led catchment initiatives. The catchment was identified by the Otago Regional Council as one with poor water quality. Initiated by the NZ Landcare Trust in 2013 and with support from the Sustainable Farming Fund, work began to bring together farmers and stakeholders to scope out a catchment plan. The Pomahaka Farmers Water Care Group was formed as they saw a need for farmers to lead and engage other farmers on good management practices to improve water quality. The success of this initial work led to a further three year Sustainable Farming Fund project 'Pathway for the Pomahaka' with wider involvement from the Pomahaka stakeholders group, Rabobank, ORC, DOC, Ravensdown, Ernslaw 1, Fish and Game, Dairy NZ and Beef + Lamb NZ, and continued support from the NZ Landcare Trust.

The work is using and showcasing industry tools to help farmers to improve farm practices that reduce nutrient loss and improve water quality. Farmers are now working to eliminate stock from waterways and manage river bank erosion along with establishing riparian planting areas. There has also been a noticeable change in the management of winter crops in the catchment, which should result in improved phosphate and other mineral levels in the summer. On-farm water testing has been instrumental in motivating action though helping farmers understand how their actions impact on water quality and why they need to make changes.

A mini-documentary focussing on management practices in the Pomahaka catchment can be accessed here:

www.youtube.com

www.landcare.org.nz/Regional-Focus/Gore-Office/Pomahaka-Project

B+LNZ Environment Plan

B+LNZ's Environment Plan guides farmers through a recorded assessment of their farm's environmental risks as well as land management opportunities. It involves a stock-take of land, soil and water resources, and results in the development of a personalised written plan identifying potential actions to be undertaken, where they might be targeted, and when they will be implemented.

A well prepared Environment Plan captures stewardship and sustainability as a record showing that measurable actions are being taken to address environmental concerns and to

demonstrate good practice. It also helps farmers understand the natural resources on their farm, and allows all those involved in the farm business to understand the plan to manage them for the long-term.

B+LNZ run regular Environment Plan workshops around the country with small groups of farmers.

www.beeflambnz.com/compliance/environment/environment-plans

Dairying and Clean Streams Accord

The *Sustainable Dairying: Water Accord* was launched in July 2013 setting out the dairy industry's commitment to improving water quality in New Zealand. It built on the Dairying and Clean Streams Accord agreement first signed in 2003. The Water Accord includes commitments to targeted riparian planting plans, effluent management, comprehensive standards for new dairy farms and measures to improve the efficiency of water and nutrient use on farms. The most

recent annual progress report on the Sustainable Dairying Water Accord was released in May 2017, indicating significant progress towards the targets e.g. 83% have nutrient management plans, up from 56% in 2013; with close to 100% uptake of riparian stock exclusion and bridging/culverting of regular stock crossings.

www.dairynz.co.nz/environment/in-your-region/sustainable-dairying-water-accord

Sustainable Milk Plans

DairyNZ works with farmers to develop Sustainable Milk Plans to help dairy farmers focus on environmentally sustainable farming practices. In the Upper Waikato pilot, 642 plans were developed, with a total of 5921 individual actions recorded (average of 9.2 actions per farm across the five management target areas of effluent, waterways, nutrients, land and water use). Most of the actions were either underway or complete

in 2015. Current modelling estimates that potential reductions in farm nutrient losses following the successful completion of 70% of all intended sustainable milk plan actions across all farms are estimated to be 5% for N and 12% for P, increasing to 8% for N and 21% for P once all actions are complete.

www.waikatoregion.govt.nz/assets

Ngāi Tahu Farming Case Study

Ngāi Tahu believe their whakapapa (genealogy) binds them to the mountains, land, forests and waters. In this way, all things are considered to have a mauri (life force), and shared whakapapa, reinforcing the tribal philosophy that all things are from the same origin and the welfare of the environment determines the welfare of the people. This is best defined by the whakataukī (proverb):

*Toitū te Marae o Tane, Toitū te Marae o Tangaroa, Toitū te Iwi
When land and water are sustained, the people will prosper*

Ngāi Tahu Farming is committed to best-practice farming, aiming to continuously improve the environmental, social, cultural, and economic outcomes associated with their operations. A current focus is Te Whenua Hou a former forestry block northwest of Christchurch. It is being developed into 6,700 hectares of new farmland (including the planting of 150 hectares of native bush). When complete, there will be 20 farms operating under gravity-flow pivot irrigation, sourcing water from the Waimakariri Irrigation Scheme.

Ngāi Tahu have high expectations around what happens on their land. All of the processes and systems on the farms have been well-researched and well thought-out so that they can deliver on Ngāi Tahu's core values, including kaitiakitanga (stewardship), tohungatanga (expertise), tikanga (appropriate action) and rangatiratanga (leadership). Significant investment in research, modelling, data and technology has been made. For example, managers get daily information gathered from soil moisture strips under every pivot irrigator, mini weather stations which tie into the MetService five-day forecast, and fertiliser application is tracked using GPS. In addition, Ngāi Tahu Farming has a three-year research project with Lincoln University to monitor nitrate leaching through the soil profile, with 40 lysimeters (measuring devices) installed on Paritea (one of the eight dairy farms at Te Whenua Hou).

www.ngaitahufarming.co.nz

The SMART Irrigation initiative

The SMART Irrigation initiative was launched in 2014. Its purpose is to provide all irrigators with the knowledge and skills to use water efficiently. The goals are for all irrigation systems to be designed and installed in-line with industry codes of practice; checked they are in working order at least annually; all irrigation applied accounts for crop requirements, soil water holding and weather forecasts; and all operators of irrigation systems are trained.

Progress to date includes 24 irrigation designers now holding a National Certificate in Irrigation Design and all large irrigation companies being accredited for their irrigation design work. An irrigation installation apprenticeship launches in 2018. The 'Bucket Test' app for assessing irrigation system performance was released in early 2017 and now has over 500 active users. Over 1,600 irrigators have undertaken irrigation manager training over the last 3 years.

The SMART initiative is transforming irrigation in NZ introducing an increased level of professionalism, knowledge and above all understanding of how to use water efficiently.

Wharekopae Water Quality Improvement (Rere Falls) project

In 2015 Gisborne District Council and Beef and Lamb New Zealand began collaborating with Rere farmers to raise water quality in the Wharekopae River to a swimmable standard. The Rere Falls and Rockslide on the Wharekopae River are popular swimming and rocksliding destinations, despite signage warning people about swimming health risks due to *E. coli* contamination from sheep and cattle.

Tangible on-farm impacts of the project to date include 4.2km of new fencing, increased stock exclusion from waterways, increased numbers of applications to the Rere

Fund, improved water quality monitoring and the Farm Environment Planning process positively influencing thinking and action on-farm.

Farmer interest and participation in the project has been high. A report has been completed telling the story of the project to date, including lessons, next steps and strategic implications. It is available here:

www.mfe.govt.nz/publications/fresh-water/engaging-farmers-improving-water-quality-rere-story

Good agricultural practice for horticulture

Horticulture's Good Agricultural Practice (GAP) schemes promote the safe and sustainable production of fruit and vegetables in New Zealand. Certification to one of the schemes is necessary for supplying many local and overseas markets. Just under 90 percent of New Zealand's commercial scale growers are certified to one of the three GAP schemes operational in New Zealand. The three schemes are operated by and under GLOBALG.A.P. and achieve consistency through the NZ Technical Working Group

NZGAP (one of the three schemes) offers an environmental risk assessment add-on to manage natural resources, including:

- Protection and sustainable use of land and water
- Responsible use of agrichemicals and fertilisers
- Waste management
- Biodiversity
- Waste, emissions and energy.

The NZGAP Environmental Management System (EMS) encompasses a number of elements including EMS guidelines, property maps, the farm environment plans, environmental risk assessments, guidelines for good and best management practises, compliance criteria, and the grower/third-party auditor checklist. This add-on is at present being offered to growers in Canterbury with plans to progressively offer it to all growers in New Zealand.

www.newzealandgap.co.nz

Tiaki Sustainable Dairying Programme

Through its Tiaki Sustainable Dairying Programme, Fonterra supports its farmers to meet all regulatory requirements, including Farm Environment Plans. Fonterra offers this service to its farmer shareholders with no additional cost through a team of Sustainable Dairying Advisors, who tailor products and services to regional requirements and each individual farm.

Additionally, all farmers must meet minimum standards set out in the Fonterra Farmers' Handbook. Environmental requirements cover effluent management, stock exclusion

from waterways, bridging or culverting stock crossings, and the supply of information to enable Fonterra to model nitrogen loss. Farmers who do not meet these requirements must work with Fonterra to develop and implement an Environmental Improvement Plan within specified timeframes. Under the terms of the supply agreement, Fonterra may suspend collection of milk if requirements are not met.

Synlait's Lead with Pride™

Canterbury-based dairy processor Synlait encourages best practice dairy farming with its Lead With Pride™ certification, which recognises and financially rewards certified suppliers. Certification requires farmers achieve best practice standards across the four pillars of milk quality, environment, animal health and welfare, and social responsibility. Included in the environment pillar are water and irrigation management, effluent management, waste initiatives, improved biodiversity,

soil quality and energy management. All suppliers must meet minimum standards and certified suppliers (ISO/IEC 17065) meeting higher standards and are paid a premium.

www.synlait.com/about/supplying-synlait/lead-with-pride

Alliance Group's environmental activities

Alliance Group is a food company headquartered in Invercargill. Alliance is ISO 14001 certified and has robust procedures and programmes in place which target areas to achieve specific environmental outcomes. Its environmental policy is based on a commitment to improve its performance across the business for the long term benefit of the environment. The company optimises its use of all resource including energy, water and chemicals and embraces the use of technology. In implementing its policy, Alliance integrates environmental management into its daily business activities. Its achievements include a greater than 20% reduction in processing energy

use since 2000 and greater than 20% reduction in water use since 2007/8 per unit of production across the co-operative. It has achieved a 98% reduction in discharged phosphorus from the Mataura Plant. A new rendering facility at Lorneville has reduced Alliance's electricity use by approximately 1.5 million kilowatt hours. The Mataura Plant generates almost 20% of the electricity it needs from its own hydroelectric plant. Alliance has also committed to a multi-million dollar wastewater treatment upgrade at its Lorneville plant that will deliver a 75% reduction in nitrogen and a 45% reduction in phosphorus in the generated wastewater and disinfection before it is discharged.

Kaitiakitanga—Te Ara Miraka

The Miraka vision—nurturing our world—reflects the company’s commitment to sustainable business practice and production of top quality products for the world market. As Kaitiaki (guardians) of the land and the environment Miraka believes it is fundamental to the sustainability of continued milk supply and the prosperity of its farmers, their future generations and therefore of the company itself.

In 2016, to ensure the value of Kaitiaki was in action from the farm to consumers, the company introduced a sophisticated farm excellence programme—Te Ara Miraka (The Miraka Way). The standards for Te Ara Miraka are founded on five Pou or pillars: People, Environment, Cows (Animal Care), Milk Quality and Prosperity. The programme gives farmers the potential to earn an extra 20 cents/kg/MS premium on top of the milk price by meeting 30 standards, including 13 mandatory ones. Farmers are provided with additional tools, resources and access to experts to help them achieve the standards so they are not “going it alone”.

Since the 2016 season, farms in Te Ara Miraka have been independently audited by a third party accredited under the Joint Accreditation System of Australia and New Zealand (JAS-ANZ) to International Standards ISO/IEC Guide 65—the international standard for ensuring competence in those organisations performing product certifications.

The company also encourages all its farmers to be proactive in the management of their farm environment and has provided an Environment Management Plan, detailing all identified risks, on-farm policies to avoid these risks, and actions to mitigate milk production impacts. Again, farmers are supported to reach the standards set.

Of the 106 farmers who supply Miraka, 103 are now actively engaged in Te Ara Miraka and are all striving to achieve standards of excellence. Feedback from suppliers indicates they welcome the opportunity to supply a company that shares their values, has invested interest in all aspects of their business success, and is prepared to offer financial incentives to support the regulatory requirements being placed on dairy farmers.

They also recognise that Te Ara Miraka is as much about production efficiency on farm and putting structures in place to mitigate their risks by maximising the quality and integrity of their products and insulating their revenue from the volatility of dairy commodity prices.

Te Ara Miraka underpins the quality assurance demanded by its customers as Miraka has moved from WMP and UHT products to value added consumer brands Taupo Pure and Whaiora.



Annexure PLM5

Track changes to Agreed National Good Farming Practice Principles¹

General principles

1. Identify the ~~physical and biophysical~~ characteristics of the farm system, assess the risks that the farm system poses factors to water quality associated with the farm system, and manage appropriately and the good farming practices that minimise the losses of sediment, microbial pathogens, phosphorous and nitrogen.
2. Maintain accurate and auditable records of annual farm inputs, outputs and management practices.
3. Manage farming operations to minimise ~~direct and indirect~~ losses of sediment and ~~nutrients~~ microbial pathogens, phosphorous and nitrogen to water, and maintain or enhance soil structure, ~~where agronomically appropriate.~~

Nutrients

4. Monitor soil phosphorous levels and maintain at or below agronomic optimum for the farm system.
5. Manage the amount and timing of fertiliser inputs, taking account of all sources of nitrogen and phosphorus, to match plant requirements and minimise risk of losses.
6. Store and load fertiliser to minimise risk of spillage, leaching and loss into waterbodies.
7. Ensure equipment for spreading fertilisers is well maintained and calibrated.
8. Store, transport and distribute feed to minimise wastage, leachate and soil damage.

Waterways

9. Identify risk of overland flow of phosphorus, sediment and faecal bacteria microbial pathogens on the property and implement measures to minimise ~~transport losses~~ of these to waterbodies.
10. Locate and manage farm tracks, gateways, water troughs, self-feeding areas, stock camps, wallows and other sources of run-off to minimise risks to water quality.
11. Exclude stock from waterbodies to the extent that it is compatible with land form, stock class and stock intensity. Where exclusion is not possible practicable, mitigate impacts on waterways.

Land and soil

12. Manage periods of exposed soil between crops/pasture to reduce risk of erosion, overland flow and leaching.
13. Manage or retire erosion-prone land to minimise soil losses through appropriate measures and practices.
14. Select appropriate paddocks for growing crops and intensive grazing, recognising and mitigating possible nitrogen and phosphorus, faecal, nutrient and sediment loss from critical source areas.
15. Manage grazing and crops to minimise losses from critical source areas.

¹ Good Farming Practice Action Plan for Water Quality 2018: <http://www.hortnz.co.nz/assets/Our-Work-files/Good-farming-practice-for-water-action-plan-2018.pdf>

Effluent

16. Ensure the effluent system meets industry-specific Code of Practice or equivalent standard.
17. Have sufficient storage available for farm effluent and wastewater and actively manage effluent storage levels.
18. Ensure equipment for spreading effluent and other organic manures is well maintained and calibrated.
19. Apply effluent to pasture and crops at depths, rates and times to match plant requirements and soil water holding capacity ~~minimise risk to water bodies.~~

Water and irrigation

20. Manage the amount and timing of irrigation inputs to meet plant demands and minimise risk of leaching and run off.
21. Design, check and operate irrigation systems to minimise the amount of water needed to meet production objectives.