IN THE ENVIRONMENT COURT **ENV-2018-CHC-000030**

AT CHRISTCHURCH

I TE KOOTI TAIAO O AOTEAROA

KI OTAUTAHI

IN THE MATTER	of the Resource Management Act 1991
AND	appeals under clause 14 of the First Schedule of the Act
BETWEEN	**WILKINS FARMING CO LIMITED**
	Appellant
AND	**SOUTHLAND REGIONAL COUNCIL**
	Respondent

STATEMENT OF REBUTTAL EVIDENCE OF THOMAS SPENCER ORCHISTON TOPIC B TRANCHE 1

22 FEBRUARY 2022

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INTRODUCTION

1. My full name is Thomas Spencer Orchiston.

2. I am employed by Beef + Lamb New Zealand (**B+LNZ**) as South Island Environment Capability Manager. This role aims to build the environmental capability of sheep and beef farmers to improve overall environmental outcomes on farms.

3. I hold a Bachelor of Science and a Postgraduate Diploma in Environmental Science from Otago University (2002).

4. I have a certificate in Sustainable Nutrient Management from Massey University (2010) and an AsureQuality Advanced Auditing Skills Certificate (2016).

5. My previous work experience includes 10 years for AgResearch Ltd as a Research Associate involved in soil, water and climate research-based projects; four years with Crop and Food Research investigating sustainable and efficient land-use through crop diversification and; three years with Landcare Research measuring carbon sequestration and plant biodiversity in indigenous forests and shrublands.

6. I have been an auditor for a farm assurance programme that provided sustainable, high value meat from low chemical input New Zealand farms for export.

7. I have been a part of the New Zealand Institute of Primary Industry Management technical advisory group on farm planning certification.

8. I have been involved in development of B+LNZ refreshed farm plan documentation and training of facilitators to deliver the B+LNZ farm plans.

9. I have completed a Land Use Capability course held in Hawke's Bay.

10. I have been co-author in five peer-reviewed journal articles. I have been lead or co-author of eight conference papers or reports and at least 50

other forms of dissemination such as farmer presentations and media articles, principally as part of my employment duties.

11. I confirm this evidence has been prepared in accordance with the Code of Conduct for Expert Witnesses set out in the 2014 Environment Court Practice Note. I reconfirm and declare I am an employee of the appellant B+LNZ. I confirm that the opinions I express in this statement represent a summary of my true and complete professional opinions. I have not omitted to consider material facts known to me that might alter or detract from the opinions that I express.

SCOPE OF EVIDENCE

12. B+LNZ is not a party to the Intensive Winter Grazing (**IWG**) rule (Rule 20(a)).

13. One of the key matters in contention is what percentage of farm area can be used for IWG as a permitted activity.[1] Wilkins Farming Co Limited (**Wilkins**) is seeking 15%.

14. In his evidence in chief Mr McCallum- Clark:

    (a) Suggests this is at odds with the Farm Systems JWS (para 118);

    (b) States it is "likely to lead to, all other things being equal, at least the same level of contaminants entering surface and groundwater" (para 119); and

    (c) Relies on a "very useful document" produced as part of the Section 42A report and updated during the Council-level hearing to assess how many farms would be captured by various scenario of the rule (para 123 - 127) which is provided as MMC Appendix 2.

15. Wilkins approached B+LNZ on receipt of this evidence as MMC Appendix 2 was largely prepared in response to the submission by B+LNZ and I had participated in the Farm Systems JWS.

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[1] Matthew McCallum-Clark, para 107(a).

16. I have been asked by Wilkins to review and respond to the Council's evidence on this confined issue. I have prepared rebuttal evidence on intensively winter grazed forage crop paddocks on sheep, beef and deer enterprises and the management of these areas, particularly in respect to the implications of the arbitrary size limitations.

WINTERING ON FORAGE CROPS

17. The primary reasons for using winter crops in Southland are for its feed value and its role in pasture renewal, pest, weed and disease management, and pasture and soil protection.

18. A well-prepared farm plan and winter grazing plan that allows flexibility for farmers to farm to the specific conditions that exist on their properties is the best way to manage the effects of winter grazed forage crops and minimise the environmental risks.

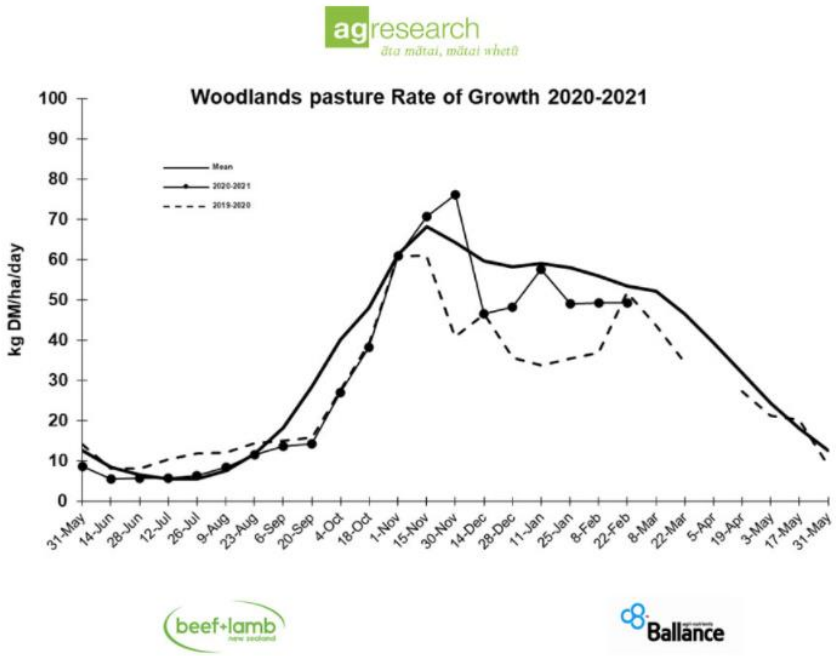
Feed supply

19. Wintering livestock by break-feeding on forage crops is common practice in Southland as pasture growth over winter is low. Using a forage crop is a way of conserving feed for stock that can be utilised over the winter to provide an adequate supply when there would otherwise be a shortage. These crops can accumulate large amounts of high-energy feed that can be grazed in situ by stock at times of the year when pasture growth rates are restricted because of low soil temperatures (Dalley and Geddes 2012).

20. In Southland, most commercial sheep, beef and deer farms configure their farm system to match stocking rates with the pasture growth curve. The rates of pasture growth changes over the year, due to climatic variation such as available moisture, temperature and daylength. It also changes in relation to the plant species being grown and its biology. The pasture growth curve for Southland typically has high pasture growth rates in spring/summer and lower pasture growth rates in winter (Smith 2012). This means there is generally an excess of feed in spring and summer and a deficit in autumn and winter. Farmers need to carefully match their stock numbers to the feed available to farm in an efficient

and profitable way and make sure that stock have an adequate supply of good quality feed.

21. **Figure 1**: Woodlands pasture growth rate summary (Southern Dairy Hub 2021)



22. During times when there is an excess of pasture feed there may be an opportunity to harvest this feed (by making for example, hay or silage) and store it for feeding during times of feed deficit. However, this will be dependent on a number of factors, including having suitable terrain for harvesting equipment to operate safely. On some farms this may be the whole farm, however on other farms there may be smaller areas that are suitable for harvesting and storing pasture.

23. Another option available to farmers to carry stock over the winter period, (when pasture covers and growth rates are low) is to use a high yielding, high feed value forage crop. This requires a crop to generally be planted during the spring, grown over the year and fed *in situ* as a standing crop to stock in winter. This part of the farm system forgoes the pasture growth over most of the year in selected paddocks but enables the crop grown in its place to be utilised in times when there is a pasture deficit over the rest of the farm.

Pasture renewal, pest, weed and disease management

24. Another important reason for using a winter forage crop is that it can form an important component of the pasture renewal. Over a period of several years, pastures can become less vigorous and other less palatable species may outcompete the more nutritious ones. As part of maintaining healthy, efficient pastures, they are periodically carefully cultivated and resown.

25. By adding a winter crop to the pasture renewal cycle during the cultivation stage, this can help improve nutrient availability, and break the lifecycles of many weeds, pests and diseases. Winter crop plants, typically a brassica species or fodder beet have different pests and diseases associated with them compared to pasture species. Changing plant species reduces the number of host plants for particular pests and diseases which often have a narrow range of potential host species. During the cultivation cycle, weed burden may be reduced by directly destroying the weeds and also reducing the seed loading of weed species. Many farmers utilise the cropping cycle to reduce weed and pest burden in pastures.

Protecting pasture and soil

26. Due to climatic conditions, mainly higher rainfall and lower temperatures, soils in the southern part of New Zealand are typically wetter during winter than at other times of the year. Wetter soils and pastures are often more susceptible to damage caused by stock and other farming activities. Farmers want to limit the impacts that are caused by stock and this can be done by careful winter grazing management and limiting the pasture areas that stock can access. Keeping stock confined to certain paddocks or areas that have sufficient quantities of high-quality feed (such as would be used with winter forage crops) can reduce pasture and soil damage across larger areas of a farm over winter. The areas chosen for winter forage cropping should be carefully selected and managed appropriately to minimise environmental risks such as sediment and nutrient loss. Keeping some areas of the farm with few or no stock can allow for improved pasture growth across larger areas of a farm, that can be grazed when conditions are suitable for stock to return to the pasture.

IMPACTS OF LIMITING THE AREA OF WINTER FORAGE CROP GRAZING

27. Farmers need to ensure that there is an adequate feed supply to keep stock healthy and in good condition.

28. Restricting the area of crop to 100 ha if the property is more than 660 ha will potentially result in perverse outcomes as land managers try to maximise the yield of dry matter from that area to produce enough feed for their stock over winter. This may lead to higher intensity winter crops being grown, such as fodder beet which typically has a dry matter content of 15-30 T/ha, compared to lower dry matter producing crops such as swedes (typically 8-18T/ha) and kale (12-18 T/ha) (Deer facts 2017). This means that the same amount of stock will be contained within a smaller more intensively grazed area for longer. Higher intensity stocking densities may, in some situations, lead to more soil damage within those areas, higher deposition rates of urinary N, and potentially higher rates per ha loss of sediment and phosphorus. However, this will be very dependent on the site-specific conditions on individual farms and the management of stock. Well-developed farm and wintering plans can help determine risks and opportunities specific to a farm.

29. By limiting the areas available for winter cropping to 100ha on some farms, will not necessarily address the concern, which is higher risk of nutrient and sediment loss. It is entirely possible that in some situations winter grazing a lower-yielding crop over a larger area will result in lower whole-farm contaminant losses than grazing a high-yielding crop in a smaller area.

30. There is a lack of scientific evidence around what area limitations should be for winter forage crop grazing.

31. Donovan and Monaghan (2021), outline some of the primary drivers for sediment loss during winter grazing and suggest the inclusion of soil properties and the impact of grazing and treading on ground cover to improve modelling for sediment loss. They state that “By understanding where landscapes are most and least susceptible to soil loss and degradation, we can minimize the intersection of deleterious grazing activities and erosion-prone areas via proactive decisions rather than

reactive strategies". A proper farm planning process including a plan for winter grazing activities allows for this proactive decision making to occur and is a better approach to winter forage crop grazing rather than arbitrary rules.

32. There is a potential for properties greater than 660 ha to be disproportionately affected due to the restriction to a maximum of 100 ha of winter forage crop grazing rather than 15% of their total farm area. This could lead to costly changes to the farm system such as:

    (a) Applying more nitrogen fertiliser to increase pasture yields and reducing the need for winter crops (may have environmental and financial cost, also may cause damage to a wider area of the farm during times when soils are wet, this will be dependant on site specific conditions and weather)

    (b) Destocking over winter (may reduce overall profitability and viability)

    (c) Taking stock off farm to winter on another farm (financial cost and may have a similar environmental impact on another farm)

    (d) Reducing overall stock numbers on farm across the year (may reduce overall profitability and viability)

    (e) Bringing in more supplementary feed such as hay, silage or baleage (financial and labour cost also brings more nitrogen into the system)

33. These measures will each involve a financial cost to the farmer and may not reduce environmental effects (or result in any benefit). For example, if they contract another farmer (that has spare wintering capacity) to winter their stock there would be still be a similar total area under winter forage cropping. Also, if stock are kept on farm, farmers can carefully plan and manage stock on their own properties, which may lead to better environmental outcomes in certain situations.

34. Farms are complex and diverse. Farmers need to be allowed flexibility to manage their farms in a way that enables them to farm in a sustainable

and responsible way while remaining profitable. They need the scope to be able to adapt to future scenarios including using new technologies or novel crops, and responding to changing climate and changing national and regional regulatory background.

35. With any winter grazing it is important to minimise the environmental risks. This can be done by following the principles of good farming management and strategic winter grazing. Monaghan et al. (2017) found that implementation of the strategic winter grazing method decreased losses of nitrogen, phosphorus and sediment in overland flow and subsurface drainage by 66%, 67% and 80%, respectively. A well-prepared winter grazing plan would include things such as identification and protection of waterways and critical source areas, grazing direction, stock management, managing and reducing damage to at-risk wet soils.

36. Flexibility with farm management practices is needed and winter grazing plans and farm plans are appropriate to manage winter grazing risks.

37. I therefore support retention of the 15% limit (rather than the proposed reduction to 10%) and the deletion of the 100ha alternative control which penalises all farms over 660ha.

Thomas Spencer Orchiston

22 February 2022

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