

**IN THE ENVIRONMENT COURT  
I MUA I TE KOOTI TAIAO O AOTEAROA**

**UNDER** of the Resource Management Act 1991

**IN THE MATTER** of appeals under Clause 14 of the First Schedule of the Act

**BETWEEN** **TRANSPower NEW ZEALAND LIMITED**  
(ENV-2018-CHC-26)

**FONterra CO-OPERATIVE GROUP LIMITED**  
(ENV-2018-CHC-27)

**HORTICULTURE NEW ZEALAND**  
(ENV-2018-CHC-28)

**ARATIATIA LIVESTOCK LIMITED**  
(ENV-2018-CHC-29)

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**WILL SAY STATEMENT OF DAWN DALLEY ON BEHALF OF THE  
DAIRY INTEREST PARTIES**

**5 November 2021**

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**WILKINS FARMING CO**

(ENV-2018-CHC-30)

**GORE DISTRICT COUNCIL, SOUTHLAND DISTRICT  
COUNCIL & INVERCARGILL DISTRICT COUNCIL**

(ENV-2018-CHC-31)

**DAIRYNZ LIMITED**

(ENV-2018-CHC-32)

**H W RICHARDSON GROUP**

(ENV-2018-CHC-33)

**BEEF + LAMB NEW ZEALAND**

(ENV-2018-CHC-34 & 35)

**DIRECTOR-GENERAL OF CONSERVATION**

(ENV-2018-CHC-36)

**SOUTHLAND FISH AND GAME COUNCIL**

(ENV-2018-CHC-37)

**MERIDIAN ENERGY LIMITED**

(ENV-2018-CHC-38)

**ALLIANCE GROUP LIMITED**

(ENV-2018-CHC-39)

**FEDERATED FARMERS OF NEW ZEALAND**

(ENV-2018-CHC-40)

**HERITAGE NEW ZEALAND POUHERE TAONGA**

(ENV-2018-CHC-41)

**STONY CREEK STATION LIMITED**

(ENV-2018-CHC-42)

**THE TERRACES LIMITED**

(ENV-2018-CHC-43)

**CAMBELL'S BLOCK LIMITED**

(ENV-2018-CHC-44)

**ROBERT GRANT**

(ENV-2018-CHC-45)

**SOUTHWOOD EXPORT LIMITED, KODANSHA  
TREEFARM NEW ZEALAND LIMITED, SOUTHLAND  
PLANTATION FOREST COMPANY OF NEW ZEALAND**

(ENV-2018-CHC-46)

**TE RUNANGA O NGĀI TAHU, HOKONUI RUNAKA,  
WAIHOPAI RUNAKA, TE RUNANGA O AWARUA & TE  
RUNANGA O ORAKA APARIMA**

(ENV-2018-CHC-47)

**RAYONIER NEW ZEALAND LIMITED**

(ENV-2018-CHC-49)

**ROYAL FOREST AND BIRD PROTECTION SOCIETY OF  
NEW ZEALAND**

(ENV-2018-CHC-50)

Appellants

**AND**

**SOUTHLAND REGIONAL COUNCIL**

Respondent

## Introduction

- 1 My full name is Dawn Ellen Dalley
- 2 I am a Senior Scientist in the New Systems and Competitiveness team at DairyNZ and have been employed by DairyNZ and their predecessor organisation (Dexcel Ltd) since 2003. I have a BAgSci (Hons 1) degree from University of Canterbury, Lincoln College (1984-1987) and a PhD in Animal Nutrition from Lincoln University (1988-1992).
- 3 In addition to 33 years researching animal nutrition, dairy farm systems and farmer change, I have strong practical and technical farming knowledge and have been providing quality information founded on science to farmers in the South Island for well over a decade.
- 4 I have published over 50 journal articles, 52 refereed conference articles, 2 book chapters, 2 technical reviews and 30 articles in industry conference proceedings and have given more than 200 presentations to science and industry groups.
- 5 My current research interests include profitable and sustainable dairy farm systems; improved crop-based wintering; animal health and welfare and alternative wintering options for southern dairy farmers. I led the four-year Southern Wintering Systems initiative for DairyNZ that partnered with dairy farmers in Southland and the three-year Pastoral 21 Future Farm Systems research in Otago and Southland.
- 6 Currently I lead the farm systems and fodder beet feeding research at the Southern Dairy Hub (**SDH**), the SDH Participatory Research project focusing on water quality, greenhouse gas emissions and farm profitability and the SDH workstream of the Thriving Southland funded Hedgehope-Makarewa Catchment group winter crop establishment demonstration.

## Code of Conduct

- 7 I have read and am familiar with the Code of Conduct for expert witnesses in the 2014 Environment Court Practice Note. I agree to comply with this Code of Conduct when participating in the conferencing. Except where I state that I am relying on the specified evidence of another person, my evidence in this statement is within my area of expertise. I have not omitted to consider material facts known to me that might alter or detract from the opinions which I express.
- 8 I acknowledge that I am an employee of DairyNZ and I may not be considered to be independent simply because of that employee status. Notwithstanding that, I can confirm that I have prepared and present this Will Say statement as an independent expert and in compliance with the Code of Conduct.

## Scope

- 9 I have been asked to provide expert comments and opinions to the practical farming implications that arise from the relief sought to the proposed Southland Water and Land Plan (**pSWLP**), including in relation to:
  - 9.1 Rule 20 – farming, specifically the 120-cow limit to mob size;
  - 9.2 Rule 35A – feed pads/ lots;
  - 9.3 The change to the definition of Intensive Winter Grazing (**IWG**) as proposed by Fish and Game;
  - 9.4 The role of Farm Environment Management Plans; and

## 9.5 Southern Dairy Hub research opportunities.

### Farming Practices

#### *120 cow limits to mob sizes on crops (Rule 20 (a)(iii)(3)(E))*

- 10 Daily area allocation to animals on crop is determined by the crop yield (i.e., the kilograms of dry matter per square metre) and the proportion of crop in the total diet (i.e., the kilograms of crop dry matter offered per cow per day). Therefore, stocking density within the allocated paddock area is driven by the amount and type of crop being offered rather than the number of cows in the mob.
- 11 In my opinion, limiting mob size to 120 cows will result in more individual areas under winter grazing management at any given time, increasing the workload and complexity of wintering implementation and potentially increasing the environmental risks.
- 12 With multiple paddocks being grazed at any one time, it will take longer for mobs to completely graze individual paddocks, reducing the opportunity for the establishment of a catch crop to capture nutrients remaining after grazing and reduce the period of exposed soil between crops and pasture.
- 13 Grazing multiple crop paddocks simultaneously, increases the complexity for planning and implementing adverse weather plans. Mob size limits will require more individual areas to be managed during adverse weather events increasing the risk of animal welfare concerns and environmental loss compared with being able to consolidate mobs and move them to fewer, lower risk areas.

#### *Feed pads/ lots and sacrifice paddocks (Rule 35A)*

- 14 If feed pads/ lots must be constructed with a sealed and impermeable base and liquid animal effluent and stormwater captured, in my opinion it is illogical to limit the number of animals able to be accommodated to 120 per feed pad/ lot as per rule 35A(a)(i).
- 15 Such a limitation will increase the cost of investment in this type of infrastructure as farmers will be forced into building multiple smaller structures to accommodate their herd, each potentially with its own effluent capture and management. Increased cost will deter some from investing in this option and more complex effluent management increases the risk of failure.
- 16 I do not think it is sensible to include sacrifice paddocks under Rule 35A with wintering pads, stand-off pads, loafing pads, and self-feed silage storage facilities, especially as no definition of a sacrifice paddock has been included in the pSWLP.
- 17 To my knowledge, sacrifice paddocks serve a different purpose within a dairy farm system to off-paddock infrastructure like the pads outlined above. Off paddock infrastructure is designed for accommodating animals for up to 24 hours per day for extended periods of time, while sacrifice paddocks are often in lower environmental risk areas and used to provide an alternative area to hold animals during periods of adverse weather; so may only be utilised for short periods on infrequent occasions.
- 18 Sacrifice paddocks are used to reduce soil damage on large areas of the farm and minimise environmental and animal welfare risks associated with adverse weather events. The proposed restrictions to mob size on sacrifice paddocks will make planning and implementing adverse weather plans more complicated without reducing the risk to water quality over and above that, which will be achieved with GMP and critical source area protection.

#### *Amendment of definition of IWG as proposed by Fish and Game*

- 19 In my opinion, changing the definition of IWG to include pasture and reference to significant de-vegetation where the definition of significant de-vegetation is 'removal of, or

*damage to, vegetation caused by stock access or grazing that results in the exposure of bare ground and/or pugging of the soil'* will have a significant impact on the operation of dairy farms across the Southland region for the following reasons:

- 19.1 Avoiding exposure of bare ground in a dairy grazing system at any time of the year is almost impossible in most pasture based dairy systems even when recommended pasture residuals of 1500-1700 kg DM/ha remain after grazing. Most farms in Southland have the potential to be captured by this definition on any land that is used for wintering stock; and
- 19.2 Avoiding any pugging of the soil by livestock (depending on the definition of pugging) in pasture paddocks following a rain event in autumn, winter or early spring, even at low stocking densities, is difficult.
- 20 The NES-F definition of IWG specifically excludes pasture and this is the common understanding within the farming community. Definitions that differ from the NES-F will create confusion on-the-ground and will cut across good management practice initiatives.
- 21 Additional confusion for farmers and auditors could arise from IWG rules specific to grazing pasture because the IWG period (1 May to 30 September) overlaps with the end (May/June) and start (July/Aug/Sep) of lactation where cows are commonly strip-grazed on pasture and de-vegetation occurs.

#### **Farm Environment Management Plans for Good Management Practice (GMP)**

- 22 Implementing GMP on-farm can minimise environmental risks and provides nutrient efficiency gains for the farm. Actions specific to individual farms and their key contaminants, would be identified and documented through a FEMP process.
- 23 Industry agreed GMPs exist that are regularly revised and modified based on new science and farmers are familiar with the terminology with many having already made changes based on opportunities identified through the development of wintering and farm environment plans. To introduce a new term – BPO in my opinion would create confusion and slow the adoption of known good management practices to improve environmental outcomes.
- 24 In my opinion, opportunity exists to improve nutrient management so that fertiliser applications better match plant requirements for both pasture and crops. Soil testing to determine nutrient status, assessing soil temperature and moisture levels, adjusting application rates, and applying when plants are actively growing will all contribute to reduced risk of environmental impact and more efficient nutrient use for plant growth.
- 25 Applying effluent to pastures and crops at the appropriate depth, rates and times and identifying differential nutrient management regimes for different zones (soil type, effluent/non effluent) maximises the value of nutrients and reduces the risk of nutrient loss through leaching and runoff.
- 26 Southland Dairy Hub (**SDH**) research is providing insights on the impacts that using GMP to manage nitrogen application rates have on environmental performance and profitability. Utilising SDH data, farm systems modelling can be used to quantify the environmental risk reduction from widespread adoption of nutrient management GMPs.

#### **Southland Dairy Hub case studies**

- 27 The Southland region is in an enviable position with the existence of the SDH; a large scale commercially based research farm. What we do at SDH, is undertake farm systems research addressing dairy sector priorities and emerging issues.

- 28 We take risks on behalf of the sector to determine the impacts and opportunities of adopting GMP and/or environmental mitigation options. Wintering, fodder beet and nutrient loss reduction are the key components of the current systems comparison. This research is significantly advanced, and it is anticipated that the results will contribute to farmers ability to comply with future limits that may be imposed.
- 29 Utilising a farm systems approach allows the sector to investigate the impact that achieving water quality outcomes has on animal welfare outcomes, productivity outcomes and financial outcomes. Farmer involvement through the planning and implementation processes, ensures that solutions are practical and adoptable for use by others. The results of our SDH research, indicate that adoption of GMP achieves improved environmental outcomes.
- 30 Preliminary results from the SDH research that is exploring farm systems, going beyond GMP and farm case studies, indicate that to achieve significant nutrient loss reduction, significant system change is required. The systems adopted are however, not currently providing financially sustainable outcomes for farmers and require further work thereto.



**Dawn Dalley**

5 November 2021