in the matter of: the Resource Management Act 1991

and: submissions and further submissions in relation to proposed variation 2 **'Hinds Plains'** to the proposed Canterbury Land and Water Regional Plan

and: **Dairy Holdings Limited**
Submitter

Statement of evidence of Colin Glass

Dated: 15 May 2015

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STATEMENT OF EVIDENCE OF COLIN GLASS

INTRODUCTION

1 My name is Colin Glass.

2 I hold the position of Chief Executive, for Dairy Holdings Limited (*DHL*), a position I have held for 15 years.

3 Previously I held the positions of General Manager and Chief Financial Officer of the NZX listed company Tasman Agriculture Ltd for five years and the General Manager of Tasman Farms Limited with Tasmanian dairy farming interests for 7 years. I have been involved with both the New Zealand and Australian dairy industries over that time.

4 I am a qualified Chartered Accountant and hold a Commerce Degree in Farm Management, and a Post Graduate Diploma in Accountancy and Corporate Finance from Lincoln University. I was raised on a mixed farming and dairy property at Methven, and from employment on a number of farming properties (throughout New Zealand) prior to my 'professional life,' I have an extensive, hands-on practical knowledge of farming.

5 Prior to commencing the position with Tasman Agriculture Limited, I was employed as a chartered accountant with Price Waterhouse in Christchurch for four years.

6 I am not providing this evidence as an expert although I do note that I have been directly involved in numerous resource consent and plan change proposals since the formation of DHL - many of which have directly addressed matters relating to nutrients (this includes Variation 1 to the proposed Canterbury Land & Water Regional Plan (*Variation 1*)). I also have a very good understanding of dairy farm systems and how dairy farms ultimately run on a day-to-day basis.

7 In the specific context of Variation 2 to the proposed Canterbury Land & Water Regional Plan (*Variation 2*) I have participated in a number of workshops/meetings that were held between submitters with an interest (either direct or in representative capacity) in the farming sector.

8 I am authorised to provide this evidence on behalf of DHL.

SCOPE OF EVIDENCE

9 In my evidence I provide:

9.1 an overview of DHL and its farm system;

9.2 an outline DHL's operations in the Hinds Plains Zone and its irrigation systems;

9.3 a discussion of the potential impacts of Variation 2 on DHL's operations focusing on good management practices and the possibility of further reductions;

9.4 the proposed transfer regime and DHL's interest in water user groups; and

9.5 a discussion on the importance of the farm enterprise regime to DHL and the need to ensure that if, in the future, reductions are applied, they are done at the level of the farming enterprise and not the individual properties that form part of it.

10 At the outset it is perhaps useful to emphasise that much of the relief sought by DHL is consistent with that sought and accepted by the Hearing Commissioners that heard Variation 1 (as there comprised). DHL considers that the final decision on Variation 1 struck an appropriate balance between viable farming activities and environmental protection. The decisions version of Variation 1 also incorporates an effective farm enterprise regime which is of particular interest to DHL. DHL therefore generally seeks consistency where possible between the final provisions of Variation 1 and Variation 2.

OVERVIEW OF DHL

DHL's operations

11 DHL is a New Zealand registered company with 100% of its farming assets in the South Island of New Zealand. It is the largest closely-held dairy farming business in the country.

12 Its farming interests are all held through wholly owned subsidiary entities however for ease of reference I simply refer to these as 'DHL' in my evidence.

13 For the 2014/15 season DHL is operating 56 dairy units on ~13,523 effective hectares, milking 44,509 cows and is on target to produce approximately 15.77 million kilograms of milk solids. DHL farms employ approximately 340 people in its operations.

14 In addition, DHL owns or leases:

14.1 4 large scale special purpose heifer grazing blocks covering a total area of ~1,352 ha that rear and grow out around 7,500 in-calf heifers each year;

14.2 12 grazing and dry stock blocks covering ~3,131ha that are utilised for carryover cows and winter grazing; and

14.3 1 bull unit (a farm with an area of 271ha) that supplies 1,200 service bulls to the dairy farms.

15 DHL's farms are principally located in the Canterbury, Springs Junction (West Coast), Waitaki, and South Otago/Southland regions.

16 The general 'DHL farm system' is based on research conducted through Ruakura and more recently the Lincoln University Dairy Farm that provides the base system for successful and profitable dairy farming. This system was initially promoted by Dr Campbell McMeeken and subsequently by Dr Arnold Bryant, continues to be supported in higher comparable stocking rate systems[1] by DairyNZ.

17 In this regard, comparable stocking rate is often regarded as a better measure than cows per hectare as, for example:

17.1 cows are not the same weight (noting that from an N-loss perspective the industry understanding is that smaller cows produce smaller urine patches which in turn results in reduced N-losses per hectare);

17.2 not all hectares grow the same amount of feed; and

17.3 imported feed is not directly counted when using cows/hectare but still influence N-losses.

18 In this regard, the company is focused on achieving consistent and repeatable levels of profitability predicated on simple, pasture based management systems. For DHL, this means a relatively low input system that has:

18.1 a reduced reliance on supplementary feed being brought on to farm;

[1] Comparable stocking rate is a measure used within the industry to measure effective stocking rate relative to the amount of feed cows consume. In this regard 'cows per hectare' is often an inadequate description of this balance, and can be misleading when comparing farms which vary in the amount of brought in feed/ha, or have different breeds (e.g. Holstein -Friesian versus Jersey). Comparable stocking rate, along with other indicators, improves the estimation of the balance between annual feed supply and feed demand.

Comparative Stocking Rate is calculated as:

$$\frac{\text{Average lwt (kg/cow) x no. cows/ha}}{\text{total feed (t DM/ha)}}$$

18.2 centralised wintering of non-lactating cows and replacement young stock raising;

18.3 careful nutrient budgeting and fertiliser applications that are aimed at producing maximum pasture (with minimum fertiliser being 'lost' in the system); and

18.4 lower stocking rates (on a per hectare basis) but a higher comparable stocking rate (in terms of the stocking rate relative to the feed available) than those which might typically be seen on other farms within the same relevant area where systems with increased supplementary feeding are adopted.

19 On the basis of this pasture-focused farm system DHL is budgeting on producing ~1,263 kg of milksolids per hectare for the 2014/15 season from its Canterbury and Waitaki dairy units.[2]

20 For the Hinds Plains zone this level of milk solid production is about 100 kg lower than what might be seen on many other farms in the area - the 2013/14 North Canterbury (which includes the Ashburton District) production per hectare was 1,396 kg MS/ha in the *New Zealand Dairy Statistics* (released annually by Livestock Improvement Corporation and DairyNZ). It is however important to again remember that this system provides a high level of resilience and good levels of profitability relative to the inputs prescribed. I also note that the general DHL farm system aligns well with good management practice – as has been advised by the South Island Dairying Development Centre (*SIDDC*),[3] maximising pasture growth ensures that, as much as possible both available soil nitrogen and the rain/irrigation water hitting the soil is taken up by plants rather than draining below the plant roots, carrying N with it.

21 This simple pastoral based farming approach has already enabled a significant number of the Group's 340 farm staff to progress through the Group's employment structure to Contract Milking, Lower Order Sharemilking and 50/50 Sharemilking positions, and subsequently farm ownership.

22 In this regard, approximately one-quarter of DHL's farms are operated by 50/50 or Variable Order Sharemilkers that own greater than 50% of the herd on the farm. The balance of the farms are operated by Managers, Contract Milkers and Lower Order Sharemilkers. This structure ensures all operators remain focused and motivated while growing their businesses within DHL.

[2] Noting that the West Coast and Southland farms are largely self-contained for their wintering requirements so not included in average provided in paragraph 19.

[3] SIDDC, Lincoln University Dairy Farm, Focus Day notes, 11 July 2013.

23 DHL also considers that a simple pasture based dairy system is ultimately the best in terms of recognising the international competitive position of the New Zealand dairy industry (where seasonal calving has been successfully adopted to closely match milk production throughout the season with pasture growth). This has resulted in the New Zealand dairy industry maintaining an international cost advantage and generally having a higher level of resilience than it otherwise would have to downturns in dairy sector returns. While the need to achieve acceptable environmental outcomes is of course accepted, it is important it is done in a way that does not put New Zealand agriculture's international pastoral advantage at risk.

HINDS PLAINS ZONE – IRRIGATION SYSTEMS

24 DHL has owns or leases 12 dairy and dairy support properties within the Hinds/Hekeao Plains Area – these are shown in **Figure 1** (the properties in **red** being those owned by DHL (all dairy farms) and as explained in the figure, the properties that are leased are shown in **black** (all dairy support properties)).

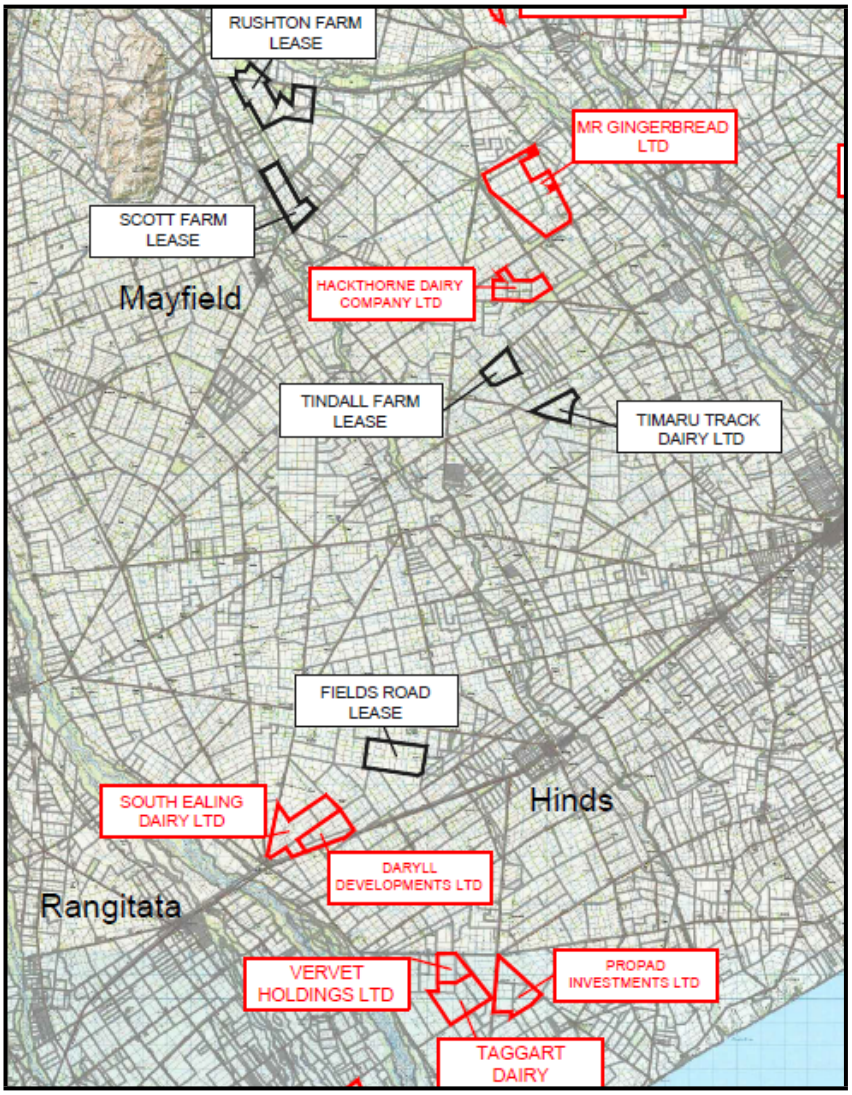

Figure 1: DHL farming properties in the Hinds/Hekeao Plains Area

25 At a general level these can be divided between:

25.1 properties above the State Highway 1 that are mainly irrigated via either border-dyke or spray irrigation systems with surface water from the Rangitata Diversion Race (*RDR*) sub-schemes (with a number of these properties also holding consents to take groundwater for either the partial or full irrigation of the relevant properties); and

25.2 properties below State Highway 1 (and outside of the RDR sub-schemes) that are irrigated via groundwater and spray irrigation systems.

26 DHL's spray irrigation systems mainly comprise of relatively efficient Rotorainer or even more efficient centre pivot irrigation systems.

27 For those properties that are currently irrigated by way of border-dyke, DHL is already well advanced in a programme (as recorded in its 5 year business plan) of irrigation system improvements. This programme is being undertaken for all of its Canterbury properties (along with associated dwelling and dairy shed upgrades), and in simple terms involves:

27.1 lowering the application rates on Rotorainers and reducing return times (so land is irrigated more often with 'smaller' applications of water, increasing overall efficiency);

27.2 upgrading both borderdyke systems and already 'improved' Rotorainer properties to high efficiency centre pivots with sprinklers in corners etc; and

27.3 de-commissioning deeper ground water bores and changing to water sourced from surface water schemes (where such water is available).

28 DHL initially prioritised irrigation these system upgrades in the Selwyn Waihora zone (where DHL owns a much larger number of properties and saw, consistent with the notification of Variation 1 prior to Variation 2, an even more pressing need for system upgrades across the catchment).

29 Upgrades on DHL's Hinds Plains properties (in addition to those that have already occurred) will be completed in the next year.

30 The cost of this programme is significant and DHL will require 'multiple millions' to see the programme through to completion (as a part of the programme DHL, for example, installed 19 pivots last year alone and 10 the year before that. In this regard, it has been DHL's experience to date that the upgrading border-dyke irrigation systems to pivot irrigation (with sprinklers in corners) has generally required DHL to outlay around $5,000 per hectare depending on the farm configuration (along with further costs to reflect the change in farm system and stocking etc).

31 The potential impact of Variation 2 is therefore of particular concern to DHL – the company would be very concerned were, having voluntarily undertaken significant system improvements, the plan were to require yet further reductions with the effect that DHL was effectively 'hit twice'.

Move from Borderdyke (and Rotorainer) to Centre Pivots

32 Across Canterbury it has been DHL's experience that moving from border dyke (and to a lesser extent Rotorainer irrigation systems) to centre pivot technology results in a saving in energy costs per hectare (especially when moving from deep ground water bores to

surface water) – however, the move from borderdyke systems to spray has generally only been viable to date on the basis that DHL was able to take any surplus water (i.e. that gained through irrigation efficiency gains) to other properties that are either not irrigated or that are irrigated through inefficient groundwater systems.

33 In the Selwyn Waihora zone, there have been a number of opportunities for DHL's to use such surplus water on unirrigated land within that catchment – however, for Hinds Plains the opportunities are much more limited. This is not only a reflection of DHL's own much smaller land holding (relatively speaking in this zone compared to Selwyn Waihora), but also the fact there is already a significant amount of land that is irrigated from surface water sources through the RDR scheme.

34 This means that for DHL system improvements in the Hinds Plains zones will not be able to be offset to any material extent through the use of surplus water elsewhere. This cost will need to be carried by the company – and although DHL is firmly committed to undertaking improvements, it is important to understand that the costs are significant and need to be carried over a long length of time.

35 It is also important to recognise that further upfront costs accrue following the conversion– in that the actual farm area increases by approximately 10% (through the 'filling in' of headraces etc). To ensure effective and efficient pasture utilisation it is necessary to increase cow numbers (with consequential effects on labour requirements, dairy shed capacity, electricity and farm housing etc).

36 Although stocking rates might increase slightly following conversion to spray, DHL's experience to date suggests (at least in the absence of being able to spread surplus water further), that the conversion is likely to deliver a net loss to overall farming profitability.

37 I discuss this further later in my evidence in the context of DHL's interest in the farming enterprise regime.

Spray irrigation systems

38 Consistent with the above, DHL has already undertaken considerable investment in the installation of spray irrigation systems on its farms.

39 These properties are irrigated from either groundwater or surface water (in a number of cases, properties are able to be irrigated from both sources). However, DHL has a strong preference for reliable surface water irrigation.

40 For those properties that already have centre pivot irrigation, there is likely to be little for opportunity for further irrigation system improvements.

FARM NITROGEN LOSS/MITIGATION

41 Without doubt, the most significant gain that DHL can make in the Hinds Plains zone is the conversion of existing borderdyke properties to spray irrigation systems. This is likely to result in a significant reduction of nitrogen loss – although, as set out, it does come at considerable cost to DHL, and the OVERSEER analysis completed to date on these properties suggests that the nitrogen loss concentration to groundwater may increase. It is nevertheless something that DHL has committed to (well prior to even the notification of Variation 2) and it is something that it is committed to following through.

42 In the context of Variation 2 it is however useful to discuss:

42.1 good management practice and the extent to which it is already being implemented by DHL;

42.2 the ability for further reductions to occur (including a discussion on wintering systems); and

42.3 the wider approach of Variation 2 to the management of N-loss.

43 Each is discussed below.

Good management practice

44 Variation 2, as notified, requires farmers to comply with the practices included in Schedule 24a. Resource consent may then be required from (especially from 2017) in the case of dairying and dairying support operations (being the farming systems undertaken by DHL) on the basis that the nitrogen loss calculation of the relevant property will exceed 20kg/ha per annum.

45 Table 13(h) then includes "*Required Nitrogen Loss Rates Beyond Good Management Practice*". This appears to focus solely on the dairy industry and for ease of reference is set out below:

Table 13(h): Required Nitrogen Loss Rates Beyond Good Management Practice

Land use	2020	2025	2030	2035
Dairy Farm	15% Reduction from good management practice nitrogen loss rates calculated based on the baseline land uses	25% Reduction from good management practice nitrogen loss rates calculated based on the baseline land uses	35% Reduction from good management practice nitrogen loss rates calculated based on the baseline land uses	45% Reduction from good management practice nitrogen loss rates calculated based on the baseline land uses
Dairy Support	10% Reduction from good management practice nitrogen loss rates calculated based on the baseline land uses	15% Reduction from good management practice nitrogen loss rates calculated based on the baseline land uses	20% Reduction from good management practice nitrogen loss rates calculated based on the baseline land uses	25% Reduction from good management practice nitrogen loss rates calculated based on the baseline land uses
Other farming activities	0%	0%	0%	0%

46 Although DHL does not know what the formal good management regime might entail, it anticipates (based on experience from elsewhere and knowledge of potential nitrogen loss mitigations) that it is likely to include matters such as:

46.1 compliant effluent systems;

46.2 fertiliser being applied in accordance with industry code of practice;

46.3 fertiliser recommendations being generated from a budgeting tool;

46.4 stock exclusion from waterways; and

46.5 irrigation efficiencies > 80%.

47 Even on DHL's borderdyke properties, the company is highly compliant against the first four matters set out. Following the completion DHL's programme of converting borderdyke properties to spray irrigation (such that all of DHL's properties in the zone are spray irrigated), there would only be very limited exceptions where an 80% irrigation efficiency might not quite be met.

48 In this regard, *slightly* lower irrigation efficiency is likely to arise only where the property layout (including features such as

waterways, powerlines, or farm infrastructure) prevent the full use of pivots on the relevant property such that additional, slightly less efficient K-line, Rotorainers or sprinklers need to be used on part of the property. However, in terms of an average irrigation efficiency across the zone, I consider it likely that an 80% efficiency requirement would be met by DHL.

49 That limited exception to one side (and emphasising that DHL does not yet have a full appreciation of what good management practice might be), DHL is not aware of any opportunities for significant nitrogen loss reduction with the Hinds Plains zone.

50 In terms of actually measuring any improvement I also note my understanding that OVERSEER already incorporates a number of assumptions around good management practice already being implemented. Good management practices are therefore things that we should all be doing – but ultimately good management practice (as assumed by OVERSEER) is perhaps best seen as both:

50.1 something we should continue to strive to meet; and

50.2 as a starting point for whatever other changes we may need to assess.

51 For DHL I consider good management practices are already being met (or will be following the full conversion from borderdyke to spray).

Further reductions

52 In terms of the opportunities for nitrogen loss reductions it is important to understand that every farm is different, noting that:

52.1 even within the DHL group of farms there are some properties (the most obvious being those that are irrigated with borderdyke systems) where significant reductions in nitrogen loss can occur – albeit at considerable cost to the farm owner; whereas

52.2 for DHL's spray irrigated properties, the opportunity for further reductions in nitrogen loss are, at least for the majority of the properties, likely to be relatively limited. In simple terms, and as set out earlier in this evidence, the optimal DHL farm system is already founded upon high efficiency irrigation systems, lower stocking rates given a greater reliance on a pasture diet, careful nutrient budgeting and reduced supplementary feed. For such properties, a requirement for further reductions is likely to have a significant impact on farm profitability and more than likely require a significant departure away from 'New Zealand's

competitive advantage' of a principally pastoral based system to advanced (and very expensive) mitigation such as herd homes.

53 Leaving the existing DHL borderdyke properties to one side, DHL is therefore concerned with the proposal in Variation 2 of a further 45% reduction (over good management practice) being achieved by 1 January 2035.

54 Although we do not know exactly what the starting point is (given the absence of advice on exactly what a formal good management practice requirement might entail), for the DHL spray irrigated properties I am particularly nervous around the extent to which further reductions might be able to be made without having a significant impact on farm viability and profit. DHL is already running a relatively 'lean' farm system which does not provide the opportunities that might exist on other properties to, for example, reduce excessive fertiliser or supplement use. Again, every farm is different.

55 Based on the technical work undertaken in support of Variation 2[4] and the discussions of that have occurred in submitter meetings and elsewhere, I understand that Variation 2 assumes further reductions might be achieved through matters such as:

55.1 the use of DCD's and improved nutrient and effluent management;

55.2 improved genetic stock and reducing autumn fertiliser;

55.3 off grazing.

56 I have a number of concerns with reliance being placed on these 'advanced mitigations', noting that:

56.1 in terms of the 'low hanging fruit', DCD's are currently not an option. Appropriate nutrient and effluent management are already being generally implemented by DHL and, subject to the conversion of the remaining borderdyke properties to spray, improved nutrient and effluent management may deliver some small improvements. Although, as I have noted earlier in my evidence, DHL is already generally operating at what I consider to be good management practice with a relatively low input system providing limited opportunities for actual improvement;

[4] For example those summarised at page 39 of *Hinds catchment nutrient and on-farm economic modelling*, Report No R13/109, Mark Everest, Macfarlane Rural Business Ltd, December 2013.

56.2 With regard to further mitigations, the only ones that appear to be potentially viable, from a DHL perspective, are those associated with:

(a) active water management. I go on to discuss this later in my evidence but in simple terms it involves irrigation system management that assumes soil moisture is optimised with an ideal irrigation system. Although it is something we should, as good farmers, aim towards it is likely to require the adoption and development of technology that currently does not exist or which cannot be properly assessed in an OVERSEER framework. DHL has recently partnered with ReGen/NEC to develop irrigation decision support software for various on-farm irrigation systems. While this technology could potentially enable irrigation efficiency gains, it is currently a long way from achieving significant savings from reduced losses to drainage As discussed, DHL already operates high efficiency irrigation spray systems and I consider 'active water management' to be an ideal rather than something that can be fully achieved at the present point in time; and

(b) a reduced autumn nitrogen application, which in turn also accommodates:

(i) a reduction in cow numbers to compensate for reduced autumn nitrogen (and/or shorter lactation length); and

(ii) a redistribution of supplement use to compensate for reduced nitrogen fertiliser use.

57 On the basis of the above it appears that the only properly viable mitigation (at least out of the examples I have discussed) is reduced autumn N application with associated changes to cow numbers (and/or a shorter lactation length) along with a redistribution in supplement use.

58 While DHL is supportive of these mitigations, I suggest that some caution needs to be applied with respect to the nitrogen loss reductions that may be able to be achieved from these practices.

59 As in the past, DHL will be looking to the Lincoln University Demonstration Farm to implement the proposed mitigations and determine the critical areas for such practices to be successful, before adopting across our extensive farming operations. This

demonstration will show just what nitrogen-loss reductions are *in fact* possible 'on-farm'.

60 I also further note that there is one other key mitigation potentially available without significant capital expenditure but I consider it would be very difficult for DHL (and the vast majority of farmers in the Selwyn Waihora zone) to implement. This is the potential to reduce stocking rate combined with increases in per cow production.

61 Despite extensive training being provided to staff and expertise in dairy systems, DHL considers this is likely to be beyond the capability of most farm managers as cows in the Hinds Plains zone already perform at high levels of production per cow relative to the national average. In the particular case of DHL it also has a relatively low stocking rate to begin with and for all farmers further reductions in stocking rate are likely to result in increasing difficulty achieving adequate, high pasture utilisation which would lead to subsequent negative impacts on pasture quality.

62 Based on work done at the Lincoln University Demonstration Farm (pers. comm. **Mr Ron Pellow**) and my own experience from elsewhere it is also important to emphasise that a reduction in stocking rate but having more efficient/higher producing cows is **not** 'the answer' to reducing **N-loss** leaching.

63 In this regard work done to date suggests that larger cows produce larger urine patches which are a much greater risk in terms of nitrogen loss leaching. Information from the Lincoln example shows that actual nitrogen losses on the dairy platform remain relatively unchanged following a move to larger and high producing dairy cows on the assumption that overall farm productivity remains the same.

64 Overall, the wider catchment is therefore no better off in terms of a move to larger and higher producing dairy cows. This is quite different to the benefits from higher genetic merit cows which are more tangible. The higher the live weight per unit of feed available or comparative stocking rate (the much better measure of stocking rate) the better a farm system is at utilising the pasture grown on farm. The ultimate nitrogen losses do not tend to vary greatly as higher comparable stocking rate farms de-stock more aggressively during the later lactation period than lower comparable stocking rate farms.

65 Following on from the above, the only other options that are currently available to reduce N-loss would be restricted autumn grazing and winter housing. These are very capital intensive and in DHL's experience could only be funded by increases in stock numbers, stocking rate and significantly increased production which,

at least to some extent, would defeat the purpose of building such structures (if the purpose is to reduce N-loss).

66 In this regard, it is important to remember that indoor wintering does not alter the total amount of nitrogen produced by cows from the relevant farm it just replaces the nitrogen lost from wintering cows that would normally be grazed elsewhere at a much lower cost. Because an indoor wintering facility collects the urine and stores it, they can reduce nitrogen leaching per cow because the nitrogen can be applied evenly and at a time of the year (late spring-summer) when the plants can use it - however, as is DHL's experience, there is a destructively high capital cost to the indoor facilities and associated effluent collection system. Ongoing operational costs are also considerably higher.

67 Offsite wintering in itself also provides its own set of issues from an nitrogen loss perspective. Under the notified version of Variation 2, properties involved in dairy support would be required from 1 January 2035 to reduce their N-loss by 25% (at least where N-losses are over that which might be provided for as a permitted activity within the rules framework).

68 Quite how this would be achieved is not clear to DHL (given that a number of the core mitigations available to a dairy milking operation and not available to a support operation), however I make the following general comments:

68.1 the number of cows that are wintered in a catchment is generally a reflection of the number of cows that are ultimately milked in a catchment. It is important to look at both together as viable wintering operations are critical to a successful and viable dairy operation. If wintering operations become uneconomic this will ultimately affect the returns on the dairy platforms;

68.2 wintering systems differ in the area of crop required to feed each cow over the winter, stocking density, urinary nitrate concentration, and the extent of overlap of urine patches – all of which affect the intensity of nitrate leaching. In this regard, it is DHL's experience (informed by work provided by SIDDC and elsewhere[5]) that although a lower yielding crop might on its face provide less losses of nitrogen per hectare, on a per cow basis it is necessary to have a larger area available for support operations – meaning that from an environmental effects perspective, centralised support operations with specialised high-yielding winter crops generally have a reduced overall environmental footprint **per**

[5] See for example, SIDDC, Lincoln University Dairy Farm, Focus Day notes, 11 July 2013

cow (and therefore in total) than the same number of cows being spread across a much wider area; and

68.3 consistent with the need to look at the 'big picture' it is important that if dairying is enabled within an area then dairying support also needs to be enabled. The alternative could potentially see cows taken out of the catchment for wintering purposes which will only lead to unintended environmental pressures in other catchment(s). This is particularly relevant in the Hinds Plains context where adjoining catchments also have their own environmental pressures and a requirement, at a per property level, to comply with a nitrogen baseline (meaning there may be limited opportunity to accommodate further cows in those catchments).

69 Certainly from DHL's perspective, I consider it may be difficult to make significant reductions in N-loss for individual wintering properties (provided the relevant wintering property is already using fertiliser sensibly – which appears to be the only matter that is able to be controlled that also influences N-losses). The only way that material reductions might be able to occur is through running less stock however that is simply 'transferring' the problem to either another property or to another catchment.

70 Overall, it is worth again emphasising that every farm is different. With regard to that observation DHL has properties at both ends of the spectrum – i.e. borderdyke properties on the one hand where significant reductions in N losses are already being made through DHL's conversion of such properties to spray irrigation systems – and on the other hand, relatively low-input pasture focused spray irrigated properties where there appears to be very limited opportunity to make material reductions while maintaining a reasonably level of profitability and overall farm viability.

71 At both the wider DHL level (i.e. across its 12 properties) and at a wider catchment level, I anticipate that small reductions **on average** will be possible – but significant care needs to be taken when looking at reductions at an individual property level to ensure overall farm viability (including the viability of support operations) is maintained.

72 The ability to implement any reduction regime will also be incredibly important. As it stands at the moment there is relatively limited technical expertise available to even prepare and assist with matters such as farm environmental management plans (appreciating that a very large number of properties in Canterbury are, or shortly will, require one). Where farm system changes are required, time will be

needed to ensure appropriate training and people are available to the industry.

Reductions more generally

73 Although the previous section of evidence discusses some of the challenges associated with reductions on dairy farms and in dairy support systems in particular, it is important to emphasise that DHL is still supportive of the overall intent of Variation 2 to reduce N-losses.

74 However, if the overall catchment reduction target is to be set at 26% (which I understand is what is proposed) then DHL considers it that should be the core focus going forward – rather than necessarily picking farm types and formally (i.e. within the Variation 2 framework) stipulating individual reduction requirements without regard to the specific circumstances on each individual farm.

75 Consistent with my comments earlier in my evidence, a reduction of 'X%' might be relatively easy to achieve on border-dyke farm but might it be almost impossible to meet on an already water efficient spray irrigated farm. The basic reduction regime should therefore, in DHL's view, focus on good management practice in the first instance and then require further reductions (if further reductions are required) on the basis of 'equal pain' with reference to the wider catchment reduction targets, rather than necessarily stipulating specific reductions for the farm type (i.e. without any regard to the extent they might be achievable on an individual basis).

76 It is also important to recognise that although the total N-loss load from a border-dyke farm might be higher, the concentration of nitrate will actually be much lower (compared to a spray irrigated property). Getting rid of border-dyke alone will not necessarily assist in fixing water quality concerns in the zone.

77 DHL therefore also supports the careful balance in Variation 2 between on-farm actions (i.e. the reduction regime) and the enablement of wider catchment tools – including managed aquifer recharge and targeted stream augmentation. All will be necessary to deliver the outcomes of sought through Variation 2.

78 In terms of compliance, DHL is also concerned that any use of OVERSEER in Variation 2 does not appear to be supported by a mechanism that allows the relevant compliance limit to be recalculated (using the same inputs) should another version of OVERSEER be released. Based on DHL's experience, a change in the version of OVERSEER can cause a significant change in 'the numbers' even where nothing on farm has changed.

TRANSFERS AND WATER USER GROUPS

79 DHL acknowledges the reasoning behind the restrictions that have been placed on transfers under Variation 2 and accepts that some form of restriction regime is appropriate given the concerns around over-allocation in the zone.

80 There are however two core exceptions to this:

Water User Groups

80.1 The original DHL submission seeks a new rule (Rule 13.5.35A) relating to the use of water user groups. In this regard, DHL has considerable experience in water user groups and considers they are a very useful mechanism assisting in the use of water more efficiently and addressing the effects of restrictions.

80.2 In this regard, DHL has already established two water user groups in the Selwyn Waihora Zone that allow it to manage:

(a) the total combined groundwater consents held by DHL; and

(b) separately, the total combined Rakaia Water surface water consents held by DHL.

80.3 The effect of the water user groups is to allow DHL to use available water on the properties that need it the most during restriction events. In practice, each property is still subject to its normal restrictions in terms of the rate of take, but an individual property's annual volume can be exceeded on the basis that water is consented but is not being used elsewhere.

80.4 During the very dry 2014/15 irrigation season, the water user groups were critical in terms of reducing the effects of irrigation restrictions. For the groundwater irrigated DHL Rakaia Selwyn properties, a number in the zone had used all their individual annual volume by early to mid-February (with around 6 weeks of the irrigation season still to go). Similarly, the Rakaia River was on significant restriction which meant that only higher reliability 'band 2 and 3' water was typically available. The water user groups allowed DHL to use water/annual volume from other properties that had not yet reached their annual volume limit to get the relevant properties through the season. Had this not been able to occur there would have been very severe effects on farm.

80.5 DHL is now in the process of establishing water user groups for its various properties in the Ashburton District.

80.6 In response to the DHL submission points, the Officer has noted that:

> 10.39 A formation of a water users' group was never considered during the preparation of Variation 2. The formation of such a group is however facilitated through region-wide Policy 4.67. Therefore it is not necessary to have a separate policy to facilitate water users 'group activities.

80.7 If that is accepted then DHL similarly accepts that water user groups are already enabled in the Hinds Plains Area. The primary concern (and the basis for DHL's submission) was that in a practical sense a water user group functions in some respects as a short-term temporary or partial transfer of water. On the basis that the wider Land & Water Regional Plan allows water user groups to be approached in a different manner to transfers (at least in so far as they relate to Variation 2) then no issue appears to arise.

Takes for dairy shed and stockwater

80.8 Variation 2 clearly contemplates further irrigation occurring within the Hinds Plains zone. By virtue of the restrictions on groundwater this will, it appears, need to be through the implementation of further surface water irrigation, especially through the Barrhill Chertsey Irrigation Scheme and Rangitata Diversion Race Management Limited sub-schemes.

80.9 In both cases, those schemes experience reasonably regular restriction events. This means that water will not be available for stockwater and dairy shed purposes (for example) when the relevant scheme goes on restriction.

80.10 In the particular case of stockwater, the Council has also recently changed its interpretation of the Resource Management Act such that where a property is owned by a company it is not able to access the abstractions permitted under section 14(3) of the Act. This applies to properties whether or not they are irrigated.

80.11 On the basis of DHL's dairy farming properties throughout Canterbury, the permitted activity authorisations contained in the Land and Water Regional Plan (up to 100 m^3/day in some circumstances) are not enough to support the take of water for stockwater **and** dairy shed water (with the required volume typically running for a mid-size farm in the vicinity of 120 to 200 m^3/day).

80.12 DHL has accordingly already lodged individual resource consent applications/variations for all its Canterbury properties that will authorise the take of dairy shed water and stockwater (given the Council's change in stockwater under the Act). As DHL has existing groundwater irrigation consents this will be able to be authorised in the Hinds Plains area as a variation to those consents – however, for many other people this often not be the case and it appears that the only way they will be able to access water for non-irrigation purposes will be through transfer.

80.13 DHL therefore supports limited provision being made for transfers where the use of that water is not for irrigation (but will be ancillary to farming activities – especially where irrigation water is received from an irrigation scheme).

81 In its original submission DHL also noted the potential use of transfers to support irrigation scheme reliability and environmental enhancement.

82 Provision for transfers in the limited circumstances outlined is therefore supported by DHL.

FARM ENTERPRISE REGIME

83 DHL has a particular interest in the provisions in Variation 2 relating to farm enterprises.

84 DHL already has what is effectively a farm enterprise consent in the Selwyn Waihora Zone (CRC143288), and is likely to apply for one in the Hinds Plains zone.

85 Going forward, such a consent is likely to be a critical component in the conversion of DHL's remaining borderdyke properties to spray and the management of nutrient more generally by DHL.

86 In this regard, DHL is seeking to manage the nutrient losses at a group level. This will also allow, for example, wintering on dryland to be supported through the farm enterprise regime so that the full effects of DHL's N-loss footprint can be managed in an integrated manner.

87 How nitrogen loss reductions are applied to DHL is also of particular importance to the company. Having moved nutrients between properties that form part of the nutrient management group/farming enterprise and potentially undertaken changes on a property in reliance on that having occurred, it is critical that any reduction regime is applied at the level of the farming enterprise.

88 The alternative would see a property having to make reductions from its original and no longer relevant individual nitrogen baseline. This could effectively – but unintentionally - see a property being penalised twice which would have a more significant adverse impact on the relevant individual property.

89 DHL supports the provisions made in the decisions version of Variation 1 in relation to the farming enterprises and considers those provisions are equally relevant to Variation 2.

90 This includes Policy 11.4.15A which was included in specific response to the same DHL submissions points in Variation 1:

> 11.4.15A(1) Enable establishment of farming enterprises in circumstances where, for the purpose of nutrient management, the total farming activity does not exceed the aggregate of the nitrogen baselines of all the parcels of land used in the enterprise (whether or not the parcels are held in single, multiple, or common ownership).
>
> (2) Enable disestablishment of farming enterprises, by which each parcel of land formerly used in the enterprise does not exceed either:
>
> (a) the individual nitrogen baseline of the land in that parcel; or
>
> (b) a nitrogen baseline limit to be determined so that the aggregate of the baselines of all the parcels formerly used in the enterprise is not exceeded.

91 The inclusion of an equivalent Policy to 11.4.15A is particularly important for Variation 2 (as it was for Variation 1) to provide guidance on not only establishment – but also on what is to happen following disestablishment (which might occur when a farm is sold or a property owner decides for whatever reason to no longer be in the farming enterprise regime).

92 In this regard, in reliance on the farming enterprise regime farmers will often make changes to their irrigation infrastructure and farming systems. Were their interest in the farming enterprise to cease then in many cases it might be impossible to revert back to the position that existed prior to the establishment of the group.

CONCLUSION

93 DHL is generally supportive of the vision for Variation 2 and the extent it seeks to enable viable farming within the Hinds Plains zone.

94 DHL does however have major concerns around the extent to which the proposed reductions are actually achievable on **some** properties (noting that at the present point in time there appears to be limited effective mitigations available – with the mitigations that are being generally modelled and not as yet demonstrated in 'real life', especially on larger size dairy operations such as those operated by DHL). In the case of its spray irrigated properties, DHL is also already likely to be doing much of what is anticipated under any possible good management regime. Care accordingly needs to be taken in ensuring that outcomes are actually able to be met before mandatory compliance is required.

95 The farm enterprise regime is of particular interest to DHL. DHL is very supportive of continuing provision being made to farm enterprises but considers it critical that if reductions are applied, they are able to be applied at the level of the farming enterprise.

Dated 15 May 2015

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Colin Glass