BEFORE COMMISSIONERS APPOINTED
BY THE WAIKATO REGIONAL COUNCIL

IN THE MATTER	of the Resource Management Act 1991
AND	
IN THE MATTER	of the First Schedule to the Act
AND	
IN THE MATTER	of Waikato Regional Plan Change 1- Waikato and Waipā River Catchments and Variation 1 to Plan Change 1
AND	
IN THE MATTER	of submissions under clause 6 First Schedule
BY	**BEEF + LAMB NEW ZEALAND LIMITED** **Submitter**

EXECUTIVE SUMMARY OF SIMON JOHN STOKES
27 June 2019

FLETCHER VAUTIER MOORE
LAWYERS
PO BOX 3029
RICHMOND 7050

Telephone: (03) 543 8301
Facsimile: (03) 543 8302
Email: cthomsen@fvm.co.nz
Solicitor: CP Thomsen

BACKGROUND

1. My name is Simon John Stokes.

2. I have over 22 years' experience in natural resource management, primarily in land, water, biodiversity and catchment operations and management. I worked in regional councils for nearly all those 22 years. My particular areas of expertise are with farm planning and the use of the Land Use Capability Survey technique and application, soils, biodiversity operations and catchment planning and management. I also have expertise in corporate management, governance and the business of regional government.

3. I am also on the governance group for the Land Use Capability Classification System, managed by Landcare Research, established in 2012.

4. In addition, recent work I have been involved with relevant to this plan change, was for the Bay of Plenty Regional Council as the Eastern Catchments Manager where I operationalised Annual Plan and ten-year plan programmes as integrated catchment management programmes for the Rangitāiki River, Ōhiwa Harbour, Waiōtahe, and Eastern river catchments. The management of these programmes were about implementing co-governance strategy's (Ōhiwa Harbour and Rangitaiki catchments); implementing sustainable land use and biodiversity plans on properties as projects with funding; providing an advisory service on a range of natural resource management issues, and building relationships, especially with iwi.

5. I provided a Statement of Evidence in Chief on behalf of Beef and Lamb New Zealand dated 3 May 201.

6. I confirm the qualifications and experience set out in my Statement of Evidence in Chief.

7. I reconfirm that I have read the Code of Conduct for Expert Witnesses in the Environment Court's 2014 Practice Note and agree to continue to comply with it.

SCOPE OF EVIDENCE

8. I have been requested by Beef + Lamb New Zealand to provide expert evidence on the New Zealand Land Resource Inventory and Land Use Capability Classification system and its proposed inclusion within the farm environment plan process for farmers in the Waikato and Upper Waipa river catchments. I will briefly cover the following topics:

   a) The New Zealand Land Resource Inventory and Land Use Capability history (in brief);

   b) The New Zealand Land Resource Inventory and Land Use Capability system; and

   c) Inclusion of Land Use Capability into PC1.

   d) And I will conclude with comment on the cultivation and grazing rules proposed in PC1.

EXECUTIVE SUMMARY

9. Farm planning, as defined by its many versions over the last 70 years and in the last decade more often termed farm environment planning, has been an ongoing and consistent approach to managing natural resource issues. Even though different regions and different agencies have faced different pressures and drivers with different planning backdrops, everyone turns towards some form of planning document or process tailored to achieve the required end result.

10. The Farm Environment Plans National Collaborative Working Group's final report in 2015 commented that "Farm environment plans are a long-standing risk management and capacity building tool. They are used by "farmers to understand the impact that they have on the environment and to shift practice to mitigate this impact, and by some sectors as part of a strategy for extracting additional market value".

11. In my opinion, the use of a tailored farm environment planning approach in PC1, underpinned by a robust stock take of the farms natural resource and the identification and management of critical source areas will deliver sustainable and enduring outcomes in the integrated management of land and water resources. These Farm Environment Plan requirements, however, should require a land resource inventory assessment interpreted into a land use capability unit at farm scale, essentially using the Land Use Capability system, which provides a multi-factor assessment to understand the natural capital (resources), their opportunities and their limitations. Farm environment planning based on prescriptive practice standards controlled by the Waikato Regional Council will not result in the farm system change required.

12. The Land Use Capability system has two key components. A land resource inventory (LRI) compiled as an assessment of the physical factors present in the field and an interpretation of that information into the standardised land use capability (LUC) classification.

13. The basis of the Land Use Capability classification is defined as a systematic arrangement of different kinds of land according to those properties that determine its capacity for long term sustained production. Capability is used in the sense of suitability for productive use or uses after taking into account the physical limitations of the land.

14. There are five factors mapped; rock type, soil type, slope angle, erosion type and severity and vegetation cover. These physical factors are the focus due to their relative importance, either individually or in combination, in relation to how the land behaves under various uses. Add in climate, knowledge about current and past land use and other supplementary information and the capability of the land can be assessed for permanent sustained production

15. The key difference between a land resource inventory approach and other land assessments is the multi-factor field technique versus single factor analysis. In my opinion a single factor field analysis cannot determine alone the land planning required. The natural resources

present and land use activities (present or future) consist of a complex series of interrelationships crossing for example geo-physical, bio-physical, and ecological boundaries for instance. Understanding this concept places single factor analysis as useful and important, but not 'complete' enough to plan farm systems or land use management. The land use capability class is the broadest grouping of the capability classification. It gives an indication of the lands versatility for sustained production taking into account the mapped inventory and therefore the general degree of limitation to use. There are eight classes ranging from class 1-8. This eight-level system was modified from the original brought from the United States. The scale ranges from Class 1 which is the most versatile land with the least limitation, to use, to Class 8 which has the least versatility and highest level of limitation, to use.

16. The land use capability sub-class is added to the code because it divides the land by its major kind of physical limitation or hazard to use. Four physical limitations are prescribed in the 3rd Ed Handbook – erodibility where susceptibility to erosion is dominant; wetness where a high-water table, slow internal drainage, and or flooding constitute the dominant limitation; soil where dominant limitation is in the rooting zone. This can occur from shallow soil profiles, subsurface pans, stoniness, rockiness, low soil water holding capacity, low fertility and salinity and toxicity; climate where the climate is the dominant limitation. This can occur from consistent drought, excessive rainfall, frost and snow and exposure to strong or salt spray. Only one dominant limitation can be used in a map polygon or area. When one or more of the limitations are mapped which can occur on non-arable land, a sub class hierarchy exists in the Handbook, whereby erosion has precedence over wetness and soil as the dominant limitation who both in turn have precedence over climate. The primary principle when prescribing a sub class is the permanency of the physical limitation, so even with management to improve or reduce the impact of the limitation, such as a land practice to improve fertility, remove stones, install permanent irrigation or erosion control, the limitation remains.

17. The land use capability unit is the most detailed part of the land use capability classification and provides a management prescription for its long-term

sustained use. The development of this part of the classification system was primarily to enable a more precise application of the system at farm scale for the farm planning programme. While a land use capability class and sub-class can be mapped, similarities and differences within the land area or polygon needed codifying to enable more precise application of the land use capability analysis. Such as similarities or differences in soil physical characteristics which help to identify nutrient risk, suitability for cultivation, pasture dry matter growth, and crop types or forestry species. This provides a more specific level of detail about the land use capability unit, which is provided in the extended legends in the national land resource inventory worksheets. For example, three land use capability units, 6e1, 6e6 and 6e10 in pumice hill country. Based on their inventory they have been classified as land use capability class 6, they have a dominant erosion limitation, but due to landform, change in slope angle, soil type and vegetative productivity variance, they are not the same in relation to their capability for long term sustained productive use and will require different and appropriate management responses. This is why the land use capability unit is called the 'management level' within the land use capability system.

18. A farm environment plan with a land use capability system can be used in models such as Overseer or Farmax, for example, ensuring greater precision in the input and output data. Overseer and Farmax both can create 'blocks' within their models which should be correlated to a property's land use capability units. Once a land use capability unit has been mapped, even in several locations on a farm, it is the same land and can be treated as a 'block'. A farm could then manage its allocation standard more accurately via a combination of more precise land resource inventory data, nutrient management input and output and pasture/crop type and dry matter production and harvest. This would give the farmer a greater level of ability to mitigate the problems associated with nutrients.

19. In my evidence in chief I omitted providing an overview of the Vegetation cover aspect of the LUC system. Vegetation cover is classified and mapped to provide knowledge of the current land cover and land use and to indicate possible future vegetation cover options. There are many vegetation cover classes to choose from within the Land Use Capability Survey Handbook and they are grouped into five major groups; grass, crop,

scrub, forest and herbaceous. The vegetation classes have also been correlated approximately with Overseer® pasture classes, in 2006. Mapping the vegetation cover can sometimes result in more than one vegetation class mapped within an area, as it is often difficult to map one type of vegetation. This is an important element of the polygon assessment as it can identify for the farmer changes in vegetation cover mapped to the extent of requiring different management or use, but not because of a change in land use capability unit. For example, an area of land mapped on rolling landscape at farm scale (1:10,000 scale) may be mostly high producing pasture but may also contain herbaceous vegetation located in infilled gullies and a significant area of gorse or blackberry. Recording this information is another benefit of the land resource inventory mapping as it can help with a planning the land use and land management requirements. Mapping at farm scale often provides the property or farm with a very accurate picture of the vegetative cover dominance aligned within the boundary of a land use capability unit. This helps the farmer clearly define the options and management requirements for their business.

20. In drafting farm plans over the years, I have referenced the stock carrying capacity by land use capability unit to give the farmer a sense of the potential stock carrying capacity, or site indexing for forestry potential. From that experience and anecdotally, many farmers were not surprised at the carrying capacity potential provided by the worksheet data, but more importantly, in combination with a greater understanding of the land use capability mapped and presented in a planned context, they were able to better grasp improving their farm system through paddock sub-division or realignment, be more precise with targeted management interventions and understand the location of additional values within the landscape such as biodiversity. It is a pathway towards continual improvement and behavioural change.

21. With regards to winter grazing and cultivation, I agree that there is an impact from cultivation, and winter (intensive) grazing, but I do not agree that land over 15 degrees should be singled out in relation to targeted restrictions. Land considered at <15 degrees is vulnerable or accelerated by its natural erosivity or land management activity, as highlighted in my evidence. Management frameworks which simply rely on slope as is proposed here are not effects based. While it is difficult to determine, the area cultivated in the

Waikato, I would estimate that the majority cultivated was on landscape at <15 degrees. Therefore, its contribution towards soil disturbance and the presence of bare ground would be a significant contributor to sediment loss into waterways. Waikato Regional Council's 2012 report on soil stability supports this comment. Cultivation and winter (intensive) grazing should be managed using best management practices irrespective of slope.

22. In my opinion, the farm environment plan proposal within PC1 will be ineffective if it does not have a land use capability system as a baseline dataset, presented spatially and used at land use capability unit management level, to manage and protect the environment and add the additional benefits to a landowners economic, social and cultural dimensions. A Land Use Capability approach provides a framework and system to enable and assist farmers to understand the relative advantage of having such information, to meet policy requirements in complex landscapes with complex ecosystems.

Dated 27 June 2019

Simon Stokes