

BEFORE THE CANTERBURY REGIONAL COUNCIL

UNDER the Resource Management Act 1991

IN THE MATTER of the proposed Canterbury Land
and Water Regional Plan

**STATEMENT OF EVIDENCE OF LYNDA MARION WEASTELL MURCHISON
ON BEHALF OF JG and LMW MURCHISON**

2ND April 2013

1. INTRODUCTION

- 1.1 My name is Lynda Marion Weastell Murchison.
- 1.2 I farm in partnership with my husband John Gilbert Murchison. We farm and reside at a property known as 'The Dry Weka' located on the true right bank of the Weak Creek, Waipara Flat Rd, Weka Pass. The property is a 250 hectare dryland sheep and beef farm which we purchased from extended family in December 2008.
- 1.3 We specialise in finishing mid-micron lambs. We carry our own breeding flock of Corriedale ewes as well as contracting to finish lambs for other farmers and for meat companies. Our free draining soils and warm climate are ideal for this sort of stock. We also grow Angus and Hereford steer calves for Five Star Beef.
- 1.4 Prior to owning this property we farmed Glenallen, a hill country sheep and beef property in the Doctor's Hills behind the Weka Pass, which we purchased in 2005. Before then we farmed and resided on the family station at Lake Coleridge. We continue to own property at Lake Coleridge which is leased to an adjoining station owner.
- 1.5 I hold a Master of Arts degree in geography (First Class honours) from Canterbury University and certificates of proficiency in natural resource law and advanced resource planning from Canterbury and Lincoln universities respectively. I also hold a National Certificate in Agriculture (Level 3) from the Open Polytechnic of New Zealand. I am a full member of the New Zealand Planning Institute and an accredited hearings commissioner. I am the 2012 recipient of the Roper Scholarship from Canterbury University and in June 2013 will commence study towards a doctorate in geography. My chosen field of study is environmental ethics in New Zealand farming.
- 1.6 I have worked in the field of resource management for over 18 years. I am currently employed by Te Rūnanga o Ngāi Tahu as the Programme Leader for Environmental Policy and Planning. I have worked in senior and managerial positions in both regional and district councils in Canterbury and run my own consultancy. From October 2008 until July 2011 I was employed as the Planning Manager Air and Rivers and then as the Principal Planning and Consents Adviser for the Canterbury Regional Council (Environment Canterbury). I was also employed as a Senior Policy Planner, Senior Consents Planner and the District Planner for Selwyn District Council from 1997 to 2005, when we moved to the Hurunui District.
- 1.7 Prior to undertaking my role at Te Rūnanga o Ngāi Tahu I was involved in some of the preliminary drafting of the pLWRP. This drafting did not include any of the provisions relating to

land uses and water quality. I also drafted Chapter 7 Freshwater of the then proposed Canterbury Regional Policy Statement. I am also very familiar with the development of the Waipara Catchment Environmental Flow and Water Allocation Plan (WCEFAR).

- 1.8 I have not provided any professional advice to Environment Canterbury or Te Rūnanga o Ngāi Tahu in relation to the provisions for land uses and water quality in the pLWRP. However I am very familiar with the work being done towards developing the Selwyn Te Waihora sub-regional plan, as this is being co-drafted between Environment Canterbury and Te Rūnanga o Ngāi Tahu. I am also involved in discussions with representatives of the primary sector and Ngāi Tahu in developing templates for best management practice.
- 1.9 I am familiar with the Code of Conduct for Expert Witnesses in the Environment Court Practice Note (2011) and I have complied with it in preparing this evidence.

2. **SCOPE OF EVIDENCE**

2.1 My evidence supports submissions made by JG & LMW Murchison on the following matters:

- (i) The water quality issues in the Waipara Catchment and the appropriateness of policies 4.28 to 4.34 and rules 5.42-5.45, 5.46-5.49 and 5.50-5.51 as they apply to the Waipara catchment;
- (ii) The definition of 'changed' as it applies to rural land uses in the pLWRP;
- (iii) The proposed regulatory structure for all farming activities as it applies to low nutrient leaching activities;
- (iv) The definition of stock holding facility; and
- (v) The provisions for afforestation in flow sensitive catchments (Policy 4.64 and rules 5.109-5.111) as they apply to the Waipara catchment.

2.2 Copies of the submissions are attached to this evidence.

2.3 Prior to addressing these issues, I would like to make some brief observations about the issue of land use and water quality in general and the commentary in the Officer's Report.

3. GENERAL COMMENTS ON LAND USES AND WATER QUALITY

- 3.1 I agree with the general analysis of the issues in Officer's Report prepared by Matthew McCallum-Clark. Managing the effects of land uses on water quality is not easy and I agree there are tensions between the purpose of the Act, particularly the enabling provisions in s5(2), and the directions in the National Policy Statement for Freshwater to establish allocation limits for water quality and quantity and to reduce over-allocation within appropriate timeframes.
- 3.2 Canterbury is relatively dependent on irrigation to maximise agricultural production compared with some other regions in the country; and the lighter, free-draining soils on the Canterbury Plains respond well to irrigation. There has been a substantial drive through the Canterbury Water Management Strategy to irrigate more of Canterbury's lighter soils. Those soils are also very 'leaky' and we've yet to find a way to irrigate these soils without leaching nutrients to groundwater. The evidence from Dr Wilcock for Ngāi Tahu in Hearing Group 1 shows that leaching rates for nitrates are quite dependent on soil type (pp13-14).
- 3.3 I think several of the Officer's Recommendations would improve the application of the pLWRP. In particular, I support Mr McCallum-Clark's suggestion (p.76) that the rule regime needs to focus on the significant nutrient contributors (though I do not wholly support the proposed new Rule 5.39 p.129 which I discuss later in my evidence). However, there are three issues which I believe need further consideration.
- 3.4 Mr McCallum-Clark's recommended amendments to the plan policies 4.28 to 4.34 (pp105-106) and rules 5.41 to 5.46 (pp129-130) result in a shift from stipulating the desired outcomes for nutrient management in each zone, to a much more permissive regime provided information on the farming activity is submitted to Environment Canterbury and, for high risk nutrient activities in Red Zones or Lake Zones, the activity is shown to be operating at an audited level of best practice. Generally I support the more permissive approach (subject to my comments in paragraph 6.5) but I am concerned that we do not lose the ability to manage very high leaching activities which, even operating at best practice, are inappropriate in some receiving environments.
- 3.5 The Officer's Report recommendations focus on managing farm activities per se rather than managing effects of land uses on water quality. I tend to think regulations work better if the regulatory authority focuses on 'what' it wants to achieve and industry practitioners to work out 'how' to comply. A good example is the suggested definition of advanced mitigation farming

practices in Recommendation R2.10.xx (p.86) I question whether some of the things included in this list constitute advanced mitigation farming practices. For example, nitrate inhibitors are on the list but are currently not an option for milk exporters, reduced/no fertiliser could be a recipe for advanced rabbit infestation and soil erosion, but comprehensive soil testing and a fertiliser response programme possibly with an option of using non-nitrogen based fertiliser, could be advanced mitigation. Similarly, no grazing of winter fodder crops may well create animal health issues, but managing fodder crops to ensure livestock have run-off paddocks and limited time on the break, may address the issue. I suggest the pLWRP focuses on the nutrient outcomes that are required from 'high risk' activities in these zones, and the applicant details the advanced mitigation practices they need to make their 'high risk' activity appropriate in that location.

- 3.6 Mr McCallum-Clark discusses the many issues raised in submissions relating to the advantages and limitations of Overseer and suggests the pLWRP shift away to give time for the model to be further refined (p.73). I agree there are other ways to identify the types of land uses that might need to be regulated for nutrient discharges in the plan (and I discuss these in paragraphs 5.5-5.6 of my evidence). But once a potentially 'high risk' nutrient leaching activity wants to establish, some measure is still required to assess the potential nutrient discharges from the proposed activity and the appropriateness of the effects on the receiving environment.
- 3.7 Mr McCallum-Clark's second paragraph on p.75 of the Officer's Report states "...the on-going work in Selwyn/Te Waihora sub-region has identified the potential to have further development providing it is based on the adoption of 'advanced mitigation activities' so that the nutrient discharges are minimised." This scenario is used as the justification for adopting an approach of improvements across the entire farming sector as a low cost opportunity to allow for further development prior to completion of the sub-regional sections.
- 3.5 I may be misunderstanding the paragraph, but I am involved in the Selwyn/Te Waihora sub-regional section and, as far as I am aware, general improvements across the farming sector have not been used to create 'head room' for further development in that catchment. Rather, I understand the technical work has started with the premise that all activities are already operating at good practice; and has identified that even using advanced mitigation techniques nitrate discharges cannot be reduced sufficiently to meet the water quality outcomes set for coastal lakes in Table 1b (p.4-3) of the pLWRP. Consequently the Zone Committee has been considering lesser water quality outcomes for Te Waihora. My understanding is that there is no head room for further development in Selwyn-Te Waihora under the current scenario for

catchment management – rather the Zone Committee has accepted further increases in nitrogen leaching will occur in the catchment because Central Plains Water has already received resource consent to irrigate an additional 30 0000ha of unirrigated land.

- 3.6 Even with a lesser water quality outcome in Te Waihora, an average nitrate leaching rate of 17kg/ha/yr will be required over the catchment. Some irrigated dairying operations on lighter soils in the upper catchment are currently leaching at around 80kgN/ha/yr and even with advanced mitigation are unlikely to get below 40-50kgN/ha/yr. I would suggest that the Selwyn-Te Waihora catchment is a very good example of the difficulty in trying to claw back over-allocation.

4. WAIPARA CATCHMENT AND APPROPRIATENESS OF RED ZONE POLICIES AND RULES

- 4.1 The Waipara catchment is identified as a red zone for water quality on page 4-8 of the pLWRP. The reason is the level of periphyton growth in the mainstem and some of the tributaries of the lower catchment during late summer. The plan then assumes that the predominant cause of periphyton growth in all red zone catchments is run-off or leaching of nutrients from rural land uses. Any change in land use is a non-complying activity under Rule 5.45 (p.5-13) and under Policy 4.31 should only occur if it will not prevent the water quality outcomes in Policy 4.1 being achieved or the nitrogen losses from the property show a significant and enduring reduction.
- 4.2 These provisions may be appropriate in red zones where poor water quality is caused by nutrient discharges from land uses. However, there is a substantial body of technical literature, including 22 technical reports prepared for Environment Canterbury on the Waipara catchment between 2002 and 2010, which show that nutrient discharges from land uses are **not** the cause of periphyton growth in the Waipara catchment.
- 4.3 In 2002 Environment Canterbury began a comprehensive study of the Waipara catchment as part of preparing an environmental flow and water allocation plan for the catchment. That plan was notified in 2010 and made operative last year. The studies included a report: S.A. Hayward, A.S.Meredith and R.M.Lavendar (Dec 2003) *Waipara River: assessment of water quality and aquatic ecosystem monitoring 1999 to 2002*, (Environment Canterbury Report no U03/11). This report monitored and reported on several factors relating to water quality in the upper and lower Waipara catchments including nitrogen, phosphorous, conductivity, dissolved oxygen, temperature, turbidity, pH, ammonia toxicity, faecal coliforms, periphyton and ecosystem health.

- 4.4 The report records that the Waipara catchment is unusual in Canterbury being one of only four hill-fed catchments flowing through soft-sedimentary rocks, rather than hard-sedimentary rocks (p.35). These soft rocks (limestones and sandstones) leach high levels of nutrients into the water and also contain very high levels of inorganic phosphorous (p.35). This high natural nutrient concentration in the water coupled with prolonged low flows particularly in summer or early autumn when there is no southerly or north-easterly rain, results in high water temperatures and ideal conditions for natural periphyton growth. Ms Shirley Hayward used the example of the Waipara catchment in her evidence in chief for Hearing Group 1 (para 3.4 pp.3-4), and suggested that the Waipara catchment is one that may never meet the water quality outcomes for periphyton growth in Policy 4.1 of the pLWRP due to these natural conditions.
- 4.5 The Waipara catchment has two distinct geographic areas. The upper catchment consists of rainfed tributaries. The depth to groundwater is substantial and groundwater yield is patchy. The predominant land uses are dryland sheep and beef farming, exotic forestry and a small amount of viticulture – all low nutrient leaching activities.
- 4.6 There is little irrigation upstream of State Highway (SH) 1 except for some surface water abstractions from landholders adjacent to the Waipara mainstem and the Weka Irrigation Scheme (Canterbury Regional Council, 2009, p.15) . The Weka Scheme was established by the Ministry of Works and Development in 1981 and consists of an in-stream dam of the Weka Creek at Anthills, directly above our farm. A residual flow of 28 l/s occurs for around 400m below the dam site until the flow goes sub-surface (Ibid, p,.21). The next 1021 l/s is diverted into the dam and feeds some 14 properties north of the Weka Creek. The mean annual flow for the Weka Creek is around 650 l/s (Ibid, p,21) so most of this water is the storage of freshes and floods. The only surface flow on the Weka Creek as it moves through our farm is during winter months (April/May until October/November depending on the weather). There is no surface flow during summer months and consequently no periphyton growth. The seven day mean annual low flow (7DMALF) for the Weka Creek at the confluence with the Waipara River is estimated in this report as zero (0) (p.18).
- 4.7 Downstream of SH 1, the Waipara River is fed by a series of springfed tributaries, the principal ones being Omihi Stream and Home Creek; so has a larger, more stable, base flow. Groundwater is shallower and more accessible in the lower catchment and there is substantially more irrigation in this part of the catchment (Canterbury Regional Council, 2009, p.15). However, the land uses remain predominantly viticulture, sheep and beef, and some horticulture. I am aware of one dairy

conversion currently being proposed at the Waipara River mouth. If it proceeds that will be the only dairy farm I am aware of in the catchment.

- 4.8 The report by Hayward et al (2003) states that water quality and ecological monitoring data indicate that the upper reaches are relatively healthy and have high water quality, with occasional concentrations of indicator bacteria where stock have access to water (p.35). It also states that water quality below the gorge is also generally good in terms of physical and microbiological determinants, but acknowledges that proliferations of periphyton are common. These are noted to be naturally derived with low summer flows cited as the major factor controlling periphyton proliferations (p.35).
- 4.9 The report concludes that there is a complex interaction between nutrient supply and flow in the Waipara catchment (p.36). It states: 'Managing nutrient inputs into the river may provide only limited ability to reduce periphyton production because of the abundant source of naturally derived phosphorous.' The report suggests that while control of nitrogen inputs may help reduce the extent of prolific growths, managing adequate flows will be important for managing periphyton (p.36).
- 4.10 There have been a variety of reports looking at water flow and yield in the Waipara catchment. These reports attribute low flows in the Waipara catchment in summer largely to climatic conditions, but with various attempts to quantify the extent to which the effects of water abstraction, afforestation in the upper catchment, and cracked willow infestation, prolong or exacerbate these low flow conditions. Duncan (2007) undertook a study of the effects of afforestation in the upper Waipara catchment on rain-fall run-off yield and his results were used to support the provisions in the Natural Resources Regional Plan (NRRP) to regulate planting of exotic forestry in the Waipara catchment.
- 4.11 The effects of water abstraction on flows in the Waipara catchment were comprehensively assessed by Environment Canterbury staff in a 2009 report: *Draft Waipara River and Tributaries Environmental Flow Regime*, Environment Canterbury Report No R09/3. That report formed the basis of a proposed Waipara Catchment Environmental Flow and Water Allocation Plan (WCEFAR). Submissions have since been heard by Environment Canterbury and the plan is now operative, so presumably the council is satisfied that the flow and allocation regime for the Waipara catchment in that plan is appropriate to achieve the purpose of the Act, including managing periphyton growth. That proposed flow and allocation regime is not part of this pLWRP.

4.12 Another possible option for reducing periphyton growth in the Waipara catchment may be to introduce an alternative water source for abstraction, or consider direct augmentation of the river. The northern part of the Waipara catchment is in the command area for Hurunui Water Project (HWP). However the policy and rule construct for Red Zones in the pLWRP frustrates this option because people are prevented from changing their land uses unless they can show a significant reduction in nutrient levels or they can meet the water quality outcomes in Policy 4.1.

4.13 Should HWP or another irrigation scheme become available, care must be taken that any changes in land uses do not exacerbate the natural periphyton growth in the catchment by leaching large quantities of nutrients. The submission by JG & LMW Murchison requests the removal of the Waipara catchment from this pLWRP in the first instance, as the key components of quality, quantity and land uses need to be dealt with together, preferably in the sub-regional section when the WCEFAR is brought into the pLWRP. Alternatively, if that relief is unacceptable, the submission asks for the inclusion of new provisions for the Waipara catchment to apply instead of those for the Red Zone. The suggested policy better reflects the Waipara catchment situation by allowing changes in land uses provided those changes will not exacerbate periphyton growth or other water quality issues; rather than requiring a substantial reduction in nutrient discharges. A change in land use becomes a restricted discretionary activity, the same as Rule 5.47 for the (light) Blue zone for the adjoining Amberley and Greta (coastal hills) catchments (as shown on p4-8).

4.14 In my view, if the Waipara catchment is to remain in the pLWRP, the policy and rule construct needs to be amended now rather than left to be corrected in the sub-regional section at a later date, for three reasons:

- (i) The Waipara sub-regional section is not scheduled on the council's current work programme until the 2017-18 financial year;
- (ii) Any sub-regional section review should start with a correct understanding of cause and effect in relation to water quality in this catchment; and
- (iii) The council has a duty under s32 of the RMA to be satisfied that the policies and rules in the plan are the most appropriate. This duty cannot be set aside on the premise that things will be 'righted' later on; especially when the Council already holds the technical information to support appropriate plan provisions now.

5. DEFINITION OF CHANGED – RURAL LAND USES

5.1 Page 2-5 of the pLWRP includes a definition of 'changed' in relation to rural land uses. This definition triggers when a farming activity is required to get a land use consent under the pLWRP (rules 5.42 to 5.45). The definition has two elements:

- (i) The provision of irrigation water or additional irrigation water; or
- (ii) The land use involves an increase in nitrogen loss of 10% above the loss for that activity as calculated between 1 July 2011 and 30 June 2013.

5.2 There are two key issues with this definition as I understand it:

- (i) There is a difficulty with how the nitrogen loss is measured and the ability of the current model of Overseer to predict changes in nitrogen loss to that degree of accuracy; and
- ii) A 10% increase in nitrogen losses penalises low nitrate leaching activities. An activity which is leaching 4kgN/ha/yr cannot increase to 4.5kgN/ha/yr without obtaining land use consent, but an activity leaching 80kgN/ha/yr can increase to 87kgN/ha/yr as a permitted activity.

5.3 This approach may have the perverse outcome of encouraging landholders to maximise their nitrogen losses before 30 June 2013 so they have more scope for further increases without being captured by the definition of 'changed.'

5.4 The Officer's Report (Recommendation R2.10.21, p.82) recommends a new definition of changed which relies on either irrigation water or a greater than 10% increase in stock units or greater than 20% increase in annual arable or horticultural yield, compared with the period 1 July 2010 to 30 June 2013. While this amendment addresses concerns with the accuracy of measuring 10% increases in nitrogen losses using Overseer, I believe it has three problems:

- (i) It still penalises smaller scale activities, i.e. one cannot increase from 400 to 450 stock units without a land use consent but one can go from 6000 to 6600 stock units as a permitted activity.
- (ii) A change in the type of stock unit may have a greater effect on nitrogen losses than an increase in stock unit numbers, for example, replacing sheep with cattle.
- (iii) The definition will capture fluctuations in stock units or percentage yields from arable or horticultural activities which are a usual part of the cycle of farming, especial given the small timeframe of 3 years over which the base number is averaged. Favourable or adverse weather

conditions could result in a change of more than 10% in stock units or 20% in arable or horticultural yield – but these are not changes in land use unless they are part of a permanent increase in productivity resulting from the application of irrigation water (which is already covered in the definition).

5.5 My understanding is that the plan is trying to capture the situation where a farmer moves from a low nutrient leaching activity to a potentially higher one. Obvious examples would be shifting from dry land sheep to irrigated dairy or arable – that is a change in land use. It is relatively easy to describe these wholesale changes in land use. The sticky part is dealing with mixed farm uses and at what stage in the mix of land uses do they change from one type to another?

5.6 On the Canterbury Plains, I suggest significant changes in the intensification of land uses are most likely to occur with irrigation. That scenario is captured in the first part of the definition of ‘changed.’ The other significant change that can occur is in higher rainfall areas and on heavier soils where intensive beef finishing or dairy support is possible through most months of the year without irrigation.

5.7 The submission of JG & LMW Murchison suggests a definition of ‘changed’ in relation to rural land use which involves two elements:

- (i) The provision of irrigation water or additional irrigation water; or
- (ii) A land use that involves the discharge of more than 20kgN/ha/yr.

5.8 The 20kg threshold is used because the pLWRP sets the threshold for active management of land uses (beyond auditing and reporting) at 20kgN/ha/yr. The evidence from Dr Wilcock for Ngāi Tahu in Hearing Group 1 also supports the 20kgN/ha/yr threshold on the basis that those activities are unlikely to have concentrations of nitrate-N which exceed the drinking water guideline of 11.3mg N/L (para 4.5, p.15).

5.9 This relief assumes Overseer can estimate changes in land uses likely to increase nitrogen losses to 20kgN/ha/yr with a satisfactory margin of error. If the Hearing Commissioners are not satisfied this is the case, then I would suggest using a qualitative description of what constitutes a change in land use: beef to arable; arable to dairy etc. I believe there are submissions that ask for that relief.

6. LOW NUTRIENT LEACHING ACTIVITIES

- 6.1 The pLWRP introduces provisions which require all farming activities, by 2017, to have an audit of their nitrogen losses using Overseer and to comply with a yet to be determined nutrient discharge allowance for that land use type. All farming activities will be required to submit documentation to show Environment Canterbury they are compliant.
- 6.2 I do not agree it is necessary, efficient or effective to regulate every farming activity in the region to control the effects of nutrient discharges on water quality. There is sufficient information on the estimated nutrient leaching rates of various land uses on different soil types in Canterbury to identify the sorts of land uses which are likely to be low potential nutrient leaching or conversely high potential nutrient leaching.
- 6.3 The submission by JG & LMW Murchison suggests the sort of rule that could be developed for low nutrient leaching activities as permitted activities. I am aware of other similar rules requested by other submitters and Mr McCallum-Clark has made comparable recommendations in his Officer's Report, which I support in principle. Mr McCallum-Clark has identified what he terms 'high risk' nutrient management activities. Either approach works in my view.
- 6.4 Mr McCallum-Clark also recommends a permitted activity rule for properties less than 5 hectares in size per se, or less than 50 hectares in size if they comply with a set of conditions (Recommendation on Nutrient Rules (unnumbered, p.129). I do not agree with the notion that permitted activities should be based on the size of the farming property. If an activity complies with the conditions for being 'low risk' why does it matter whether the activity is on 5 hectares, 50 hectares or 500 hectares? Similarly, if the activity is deemed 'high risk' it should not matter whether it is occurring on 5 hectares, 50 hectares or 500 hectares, the risk should be managed. I agree that the use of arbitrary measures such as property size may be a practical solution when it is difficult to construct more precise, effects-based rules. In this case, I believe there is sufficient information to construct rules which identify the conditions for potentially low nutrient leaching activities, without having to use the more arbitrary measure of property size.
- 6.5 The Officer's Report recommends new rules 5.39 to 5.47 (p129-130). In all zones other than Red Zones and Lake Zones, land uses which do not meet the recommended 5 hectare or 50 hectare areas specified in Rule 5.39 would be permitted activities provided information on the farming activity is submitted to Environment Canterbury. I have some difficulty with a permitted activity rule

where the only condition is to provide information to the council. It would seem then, that the purpose of the condition is simply to gain information, and I believe there are cheaper avenues to obtain more targeted information than requiring all landholders to go to the cost of submitting a plan to the council. For example, Statistics New Zealand conduct an annual (compulsory) survey of all farms in New Zealand, which includes detailed questions on land use type and farm size, irrigation, nutrient budgets and fertiliser use.

7. STOCK WITHHOLDING FACILITIES

7.1 Rule 5.35 (p.5-10) of the pLWRP includes rules for the discharge of animal effluent or water containing animal effluent, including from land used for a stock holding area. Stock holding area is defined on p.2-14 of the pLWRP and includes any area of land where the construction of a holding area or the confining of stock at densities precludes pasture or vegetation cover, and is used for confining livestock for more than 30 days in any 12 month period.

7.2 It seems the purpose of the rule is to manage facilities for holding animals which may result in the accumulation of effluent or wash down water which needs to be collected, stored and appropriately disposed of to avoid contamination of water ways through either run-off or leaching of effluent. However, the definition may capture all stock yards, including traditional outdoor sheep and cattle pens constructed on pasture or dirt which all farms, sale yards and many lifestyle blocks have. The reasons are:

(i) Most sheep and beef farmers would have stock in their yards at some point of the day on more than 30 occasions in 12 months and the definition does not say how long stock has to be held in a yard for any time to constitute a 'day' in the 30 day allocation.

(ii) The definition refers to construction or a stocking density that precludes maintenance of pasture or vegetation cover. This part of the definition may be intended to exclude the sorts of yards I am concerned about but it is not clear. When stock is put into yards, it is at a density whereby they make quick work of any pasture or weeds. and covered yards or yards next to shelter belts may not grow vegetation cover.

7.3 The submission by JG & LMW Murchison suggests an amendment to the definition to exclude cattle and sheep yards which do not have an impervious floor.

8. **AFFORESTATION RULES**

- 8.1 As noted in paragraph 4.10, the pLWRP has rules to control the amount of land which is planted in exotic forestry in 'flow sensitive' catchments. Waipara catchment is a flow sensitive catchment upstream of Teviotdale and Weka Creek upstream of what is termed Archer's Creek Dam in the pLWRP (p7-4) (but may be meant to refer to Anthills Creek Dam).
- 8.2 I understand these provisions have been carried over from the NRRP, but whereas under the operative NRRP the afforestation rules applied per catchment, in the pLWRP the rules apply per site – being an area held in one Certificate of Title (Rule 5.110, p5-26). In my view the application per site is a fairer way to allocate limited rights to a land use among landholders within the catchment; particularly when other land use options are limited as well. The provisions do not prevent any person from applying for resource consent to plant additional forestry if she/he can demonstrate the planting will not affect water yield in the catchment under Rule 5.111 (p.5-26).

9. **CONCLUSIONS**

- 9.1. The Waipara catchment is zoned red for water quality in the PLWRP (p.4-8). The associated policies and rules for land uses in Red Zones assume poor water quality is the product of nutrient discharges from land uses in the catchment. These presumptions are incorrect for the Waipara catchment, based on the technical reports prepared by Environment Canterbury between 2002 and 2010. These studies attribute the predominant cause of periphyton growth in this catchment as being a combination of high natural nutrients concentrations in the water caused by leaching from soft-sediment rocks in the catchment and low summer rainfall, creating prolonged periods of low flow and warm water temperature. Hayward et al (2003) concluded that managing nutrient inputs into the river may provide only limited ability to reduce periphyton production.
- 9.2 These studies also made recommendations as to the best options to manage periphyton growth, including: maintaining adequate flows in the Waipara River; restricting afforestation in the upper catchment; and excluding stock from the water bodies. These measures have already been addressed either through provisions in the pLWRP (stock exclusion and afforestation) or the WCEFAR for river flows
- 9.5 The pLWRP seeks to manage effects of changes in land uses on water quality in the first instance, by managing changes in land uses which may result in increased nitrogen losses. The plan provisions for defining land use change rely on a percentage change in nitrogen losses, so capture

small increases in nitrogen losses from low nutrient leaching activities but allow for substantial increases in nitrogen losses from high nutrient leaching activities. The pLWRP regulates all farming activity from 2017, irrespective of the contribution it makes to nutrient discharges and water quality.

9.5 The pLWRP provisions could be improved in the following ways:

- (i) Define 'change' of land use as activities involving new or additional irrigation water or a shift to an activity with a significantly higher nitrogen loss potential, described either quantitatively using a base N load (if Overseer can assess such changes with sufficient accuracy) or using a qualitative description: arable, dairy, intensive beef grazing etc.
- (ii) The regulatory system should focus on high potential nutrient leaching activities and include a rule identifying activities which are likely to be low level nutrient leaching as permitted activities. This rule should be based on the activity, not the size of the property, as there is sufficient information on the spectrum of potential nitrogen losses from various farming activities on different soil types to write an effects-based rule.
- (iii) The management of high potential nutrient leaching activities needs to include an assessment of the sensitivity of the receiving environment, even if the activity is operating at best practice. There will be areas in the Region where high nutrient leaching activities will adversely affect water quality even when operating at best practice. Once they are established it is very difficult to try and reduce their effects retrospectively.
- (iv) What constitutes best practice or advanced mitigation for an activity is best established by the industry sector.



Lynda Weastell Murchison

4th April 2013

REFERENCES

Duncan M (2007) *The Effect of Land Use Change on Water Yield*, presentation to NRRP Variation 1, Chapter 5, Policy WQN 7, September 2007

Familton H (2009) *Draft Waipara River and Tributaries Environmental Flow Regimes*, Environment Canterbury Report No R09/3.

Hayward SA, AS Meredith & RM Lavender (2003) *Waipara River: assessment of water quality and aquatic ecosystem monitoring, 1999-2002*, Environment Canterbury Report No U03/11.

Hayward SA (2013) *Statement of Evidence of Shirley Ann Hayward for the Group 1 Hearing of the proposed Canterbury Land and Water Regional Plan.*

Wilcock RJ (2013) *Statement of Evidence of Dr Robert John Wilcock on behalf of Ngā Rūnanga of Canterbury, Te Rūnanga of Ngai Tahu and Ngāi Tahu Property Ltd for Group 1 Hearing of the proposed Canterbury Land and Water Regional Plan.*

ATTACHMENT ONE – SUBMISSIONS OF JG AND LMW MURCHISON

**Resource Management (Form, Fees and Procedures) Regulations - Schedules 2003
Form 5**

Clause 6 of the First Schedule, Resource Management Act 1991
Submission on a publicly notified proposal for a plan

To: Environment Canterbury
PO Box 345
Christchurch

Name of Submitter:

JG & LMW Murchison as Trustees in the Murchison Trust

This is a submission on the following proposed plan - Proposed Canterbury Land and Water Regional Plan

I could not gain an advantage in trade competition through this submission.

The specific provisions of the proposal that my submission relates to is:

The definition of 'change' in relation to farming activities on p.2-5 and its application to rules 5.42 to 5.45.

My submission is:

I oppose the definition as it is currently written.

My reasons are: that the definition of a 'change' in farming activity being an increase of more than 10% in nitrogen loss from the same land as measured for the period 01 July 2011 to 30 June 2013 is:

- Uncertain, as no one can know by the close of submissions on this plan what their nitrogen loss will be on a piece of land by 30 June 2013.
- Uncertain, as the Overseer model used to calculate nitrogen loss is not accurate to within 10%
- Impractical, from a farm management perspective, as the nitrogen discharge from any area of land will vary year to year depending on the season, climatic conditions and the use to which that land is being put as part of the farm cycle.
- Unfair on low nitrate leaching activities as one gets caught by the definition and thus rules 5.43 to 5.45 requiring resource consents to change the farming activity, irrespective of how much nitrogen is being leached. This approach is inconsistent with the approach for existing farming activities, and imposes the same cost on all landholders whether they are contributing significantly to nutrient enrichment in the catchment or not.
- Unnecessary, the changes in farming activities in Canterbury that are likely to result in significant increases in nitrogen leaching are only likely to occur with either irrigation water or dairy conversion; and the latter is unlikely to occur without irrigation water.

Therefore, I do not agree the definition and associated rules achieve the purpose of the Resource Management Act 1991 or that the Council has fulfilled its duty under s32 to be satisfied that the

definition and associated rule structure is the most appropriate method to achieve the plan's objectives.

I seek the following decision from the Council:

Amend the definition of 'change' to a farming activity to be:

- (a) *The application of irrigation water or an increase in irrigation water; or*
- (b) *A change in land use which increases the nitrogen discharged per hectare to over 20/kg/ha/yr, averaged over the farm.*

Any consequential amendments required to give effect to this submission.

I do wish to be heard in support of my submission.

I am prepared to make a joint case with other parties.



Signature of Submitter (or person authorised to sign on behalf of submitter)

Date: 04 October 2012

Address for Service of Submitter:

The Trustees in the Murchison Trust

c/- LMW Murchison

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**Resource Management (Form, Fees and Procedures) Regulations - Schedules 2003
Form 5**

Clause 6 of the First Schedule, Resource Management Act 1991
Submission on a publicly notified proposal for a plan

To: Environment Canterbury
PO Box 345
Christchurch

Name of Submitter:

John Gilbert Murchison and Lynda Marion Weastell Murchison

This is a submission on the following proposed plan - Proposed Canterbury Land and Water Regional Plan.

I could not gain an advantage in trade competition through this submission.

The specific provisions of the proposal that my submission relates to is:

Policies 4.27 to 4.38, Rules 5.39 to 5.42 and rules 5.46 to 5.5.51; and schedules 7 and 8.

My submission is:

I oppose the provisions as they apply to the management of nutrient discharges from existing farming activities.

My reasons are:

- Policies 5.39 to 5.41 assume that farmers are not aware of their nutrient discharges and are not farming at good practice and that making farmers audit their discharges through OVERSEER will somehow correct this situation. There is no evidence on which the Regional Council has based this presumption.
- The provisions are uncertain, as the Nutrient Discharge Allowances (NDAs) have not been calculated and included in Schedule 8. No indication has been given as to how those nutrient discharge allowances will be developed, by whom, or how they will apply. Therefore, no person reading the plan (including the Canterbury Regional Council) can possibly know whether the NDAs for each activity will achieve the purpose of the RMA or give effect to the NPS for Freshwater or the RPS, or be the most appropriate method in terms of s32 of the RMA.
- The Overseer model used to calculate nitrogen loss is not wholly accurate and as we understand it, is not calibrated for use of other than commercial-based fertilisers such as superphosphate and urea. The requirement to use Overseer has the potential perverse outcome of requiring farmers who are currently using other forms of fertilizer or soil management, to move to phosphate and nitrate based fertilizers to comply.
- Unfair – the same level of compliance is required by any person undertaking any sort of farming activity, irrespective of the degree to which one is discharging nutrients. This includes landholders who are leaching less than the 20kg/N/ha/yr that is necessary to trigger a nutrient management plan. The cause and effects are not married in the plan provisions.

- Unnecessarily expensive – the compliance costs for these provisions are potentially very large for both individual landholders and the Region as a whole, for very little environmental gain in many instances. The costs are also unnecessary as it is possible to identify the nature of land use activities that are likely to fall well below a nutrient discharge of 20kg/N/ha/yr. Those activities can be identified and written out of the regulatory process through rules for permitted activities.
- Does not achieve the purpose of the RMA – The policies and rules do not consider the appropriateness of the level of nutrient leaching to the sensitivity of the receiving environment. Rather as long as someone is operating at the NDA for that activity it may continue, even if that activity is a very high nutrient leaching activity at best practice, and the environment is very sensitive to nutrient leaching.
- Unnecessary to control at this stage – changes in farming activities in Canterbury that are likely to result in significant increases in nutrient leaching are only likely to occur with either irrigation water or dairy conversion; and the latter is unlikely to occur without irrigation water. Those activities are managed through the ‘change in farming activity’ provisions. The ‘claw-back’ in existing over-allocated catchments is being managed through the sub-regional sections and in this submission, that is the most appropriate place.

Therefore, I do not agree the policies and rules achieve the purpose of the Resource Management Act 1991(RMA) or give effect to the NPs for Freshwater or the Regional Policy Statement. In regard to these provisions, I do not believe the Council has fulfilled its duty under s32 of the RMA to be satisfied that the provisions are the most appropriate to achieve the plan’s objectives.

I seek the following decisions from the Council:

As a first preference, delete the provisions for existing farming activities from the plan and manage any ‘claw-back’ of over-allocated catchments through the sub-regional plan sections.

As a second preference, develop appropriate nutrient discharge allowances or other controls for existing farming activities first, and then notify the plan provisions once they have been developed.

Include in those provisions, rules for farming as a permitted activity where nutrient discharges will be below the 20kg/N/ha/yr. This submission suggests a rule which reads:

The discharge of nutrients from any farming activity is a permitted activity provided it complies with all of the following conditions:

- (i) *The farming activity does not carry more than 10 stock units per hectare averaged over any two year period;*
- (ii) *Fertiliser (except for urine and dung discharged by animals grazing on the property) is not applied to any land area more than three times in any 12 month period;*
- (iii) *Any fertiliser application complies with rules 5.52 and 5.53;*
- (iv) *The land area is not irrigated;*
- (v) *The land area is not used to spread stored effluent; and*
- (vi) *The land area is not used to graze dairy herds.*

Any activity which does not comply with these conditions shall be a permitted activity if it complies with the nutrient discharge allowance for that activity shown in the plan and that nutrient discharge allowance is less than 20kg/ha/yr; or

A discretionary activity if it cannot comply with the nutrient discharge allowance or the nutrient discharge allowance is over 20kg/ha/yr.

Any consequential amendments required to give effect to this submission.

I do wish to be heard in support of my submission.

I am prepared to make a joint case with other parties.



Signature of Submitter (or person authorised to sign on behalf of submitter)

Date:

04 October 2012

Address for Service of Submitter:

JG & LM Murchison
The Dry Weka
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**Resource Management (Form, Fees and Procedures) Regulations - Schedules 2003
Form 5**

Clause 6 of the First Schedule, Resource Management Act 1991
Submission on a publicly notified proposal for a plan

To: Environment Canterbury
PO Box 345
Christchurch

Name of Submitter:

John Gilbert Murchison and Lynda Marion Weastell Murchison

This is a submission on the following proposed plan - Proposed Canterbury Land and Water Regional

I could not gain an advantage in trade competition through this submission.

The specific provisions of the proposal that my submission relates to is:

Policies 4.28 to 4.34; Rules 5.42 and 5.45, Rules 5.46 and 5.49 and Rules 5.50 and 5.51; and Nutrient Zone map on p4-8, as they apply to the Waipara Catchment.

My submission is:

I oppose the provisions as they apply to the Waipara Catchment.

My reasons are:

- The plan provisions rely on periphyton indicators to identify catchments where water quality outcomes are not being met. The plan provisions then assume that the reason for water quality outcomes not being met is nutrient enrichment from land uses in the catchment. The plan provisions require significant reductions in nutrient discharges for both changes in land uses; and from 2017 for existing land uses which do not comply with the yet to be developed NDAs or the NDA is over 20kgN/ha/yr.
- This scenario is inaccurate for the Waipara Catchment. The Canterbury Regional Council's own technical reports (including Mosley 1994, Hayward 2003 and the staff technical report 2010) have repeatedly recorded the water quality in the Waipara catchment as generally very good, and identified the catchment as susceptible to periphyton growth during periods of prolonged low flow (below 100 l/s) in late summer. Factors affecting prolonged summer low flow have been attributed in various reports, with differing degrees of certainty, to natural climatic conditions, afforestation in the upper catchment, willows, and abstraction.
- I understand from the Regional Council's own staff (Dr Tim Davie) that there is a high natural nutrient content in the river due to the geology of the upper catchment, particularly the Waipara Gorge.
- Given the land uses in the catchment (forestry, viticulture and dryland sheep and beef) it will be very difficult for landholders to significantly reduce their nutrient discharges. Even if they could, it will not result in the Waipara Catchment achieving the water quality outcomes set in the plan.

- The NRRP already has rules managing further afforestation in the catchment and these have been included in the proposed Land and Water Regional Plan. Abstraction in the catchment is managed through the Waipara Catchment Environmental Flow and Allocation Regional Plan which was heard and determined by the Canterbury Regional Council in 2011 and does not form part of this plan.
- The one remedy identified by the Hurunui-Waiiau Zone Committee to relieve low flows in the Waipara Catchment is through the Hurunui Water Project Scheme either augmenting the river or as an alternative supply for abstractors. A significant portion of the Waipara Catchment is in the command area for that scheme. The proposed plan provisions work against this aspiration and seem to be at odds with the vision and principles of the CWMS and the work of the Hurunui-Waiiau Zone Committee.
- Any change in land uses in the Waipara Catchment that increases nutrient discharges needs to be managed, to ensure it does not exacerbate periphyton growth. This issue can be addressed through a policy and rule construct suggested in this submission.

Therefore, I do not agree the policies and rules achieve the purpose of the Resource Management Act 1991(RMA) or give effect to the NPs for Freshwater or the Regional Policy Statement. In regard to these provisions, I do not believe the Council has fulfilled its duty under s32 of the RMA to be satisfied that the provisions are the most appropriate to achieve the plan's objectives.

I seek the following decisions from the Council:

As a first preference, delete the provisions for managing nutrient discharges from the Waipara Catchment from this plan and address the matter through the sub-regional plan section in due course.

As a second preference:

Reclassify the Waipara Catchment from Red Zone to Blue Zone (unclassified); or

Develop a new classification for catchments such as the Waipara where water quality outcomes for periphyton are not being met but which the predominant cause is not nutrient discharges from land uses.

Introduce a new policy which reads:

In the Blue/X Zone, to ensure any change in land uses and associated increase in nutrient discharges do not, singularly or cumulatively, exacerbate periphyton growth or any other water quality issues in the catchment.

Amend the status for the change of land uses from non-complying to restricted discretionary activity and apply the discretion from Rule 5.47.

Any consequential amendments required to give effect to this submission.

I do wish to be heard in support of my submission.

I am prepared to make a joint case with other parties.



Signature of Submitter (or person authorised to sign on behalf of submitter)

Date: 04 October 2012

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**To: Environment Canterbury
PO Box 345
Christchurch**

Name of Submitter:

John Gilbert Murchison and Lynda Marion Weastell Murchison

This is a submission on the following proposed plan - Proposed Canterbury Land and Water Regional Plan

I could not gain an advantage in trade competition through this submission.

The specific provisions of the proposal that my submission relates to are:

Policy 4.64 and Rules 5.109 to 5.111

My submission is:

I support the policy and rules for plantation forests in flow-sensitive catchments.

My reasons are:

- The rules applying to 15% of the area of the site rather than 15% of the catchment as a whole, is a fairer way to allocate a land uses when the cumulative effect has to be managed. It is also much easier to administer and to comply with.
- In the Waipara catchment, the effects of various regulations including limits on irrigation water, afforestation, and now nutrient discharges already leave landholders with very few viable land use options.
- The 'first in-first served' approach continues to disadvantage those landholders who are already restricted in their land use options due to the effects of other land uses in the catchment.
- The rules do not prevent a person from making an application to plant more than 15% of their site if they can show the additional planting will not have an adverse effect on water yield.

I seek the following decision from the Council:

Retain Policy 4.64 and rules 5.109 to 5.111 as written.

Any consequential amendments required to give effect to this submission.

I do wish to be heard in support of my submission.

-

I am prepared to make a joint case with other parties.



Signature of Submitter (or person authorised to sign on behalf of submitter)

Date: 04 October 2012

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To: Environment Canterbury
PO Box 345
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Name of Submitter:

John Gilbert Murchison and Lynda Marion Weastell Murchison

This is a submission on the following proposed plan - Proposed Canterbury Land and Water Regional

I could not gain an advantage in trade competition through this submission.

The specific provisions of the proposal that my submission relates to are:

Definition of stock holding area (p.2-14) and rules 5.35 to 5.36

My submission is:

I oppose the definition of stock holding area and rules 5.35 to 5.36.

My reasons are:

- Rule 5.35 makes the use of land for a stock-holding area a restricted discretionary activity. From the rule it would appear this is to deal with effluent run-off and presumably aimed at dairy feed pads, dairy sheds and other areas of a farm where effluent may collect and needs to be washed down, and the run-off collected and disposed of.
- However, the definition of stock holding area in the plan includes any holding area used to confine stock for more than 30 days in any 12 month period. This definition will apply to every ordinary set of sheep or cattle yards on every farm in the Region.
- It is normal practice for sheep farmers, except possibly on very extensive high country stations, to hold some stock in their yards at least once a week for activities such as weighing finishing stock, animal health, for transport etc.
- The yards are usually dirt-based, are not washed down, and do not result in the need to collect and dispose of effluent to avoid it entering water or groundwater.
- The rule as written imposes an unnecessary cost of compliance on farmers for effects which are *de minimus* and for which there is no remedy.

Therefore, I do not agree the rules as written achieve the purpose of the Resource Management Act 1991 or that the Council has fulfilled its duty under s32 to be satisfied that the rules in this form are the most appropriate method to achieve the plan's objectives

I seek the following decision from the Council:

Amend the definition of stock holding area to:
Exclude sheep and cattle yards which do not have an impervious floor area and which are used for not more than 90 days in any 12 month period.

Any consequential amendments required to give effect to this submission.

I do wish to be heard in support of my submission.

-

I am prepared to make a joint case with other parties.



Signature of Submitter (or person authorised to sign on behalf of submitter)

Date: 04 October 2012

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