MARLBOROUGH
DISTRICT COUNCIL

RESOURCE MANAGEMENT ACT 1991

Decision on Plan Changes 23 and 58 - Use of Wind Machines for Frost Protection

Ref: M135-15-23
W045-15-58

This document contains the decision of the Marlborough District Council on Plan Changes 23 & 58 to the Marlborough Sounds and Wairau/Awatere Resource Management Plans.

Included as part of this decision is the reasons and amended Schedule of Changes.

DECISION DATE:
18/5/10

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Decision made under delegation (Minute E.09/10.416) from the Marlborough District Council by Sub-Committee members:

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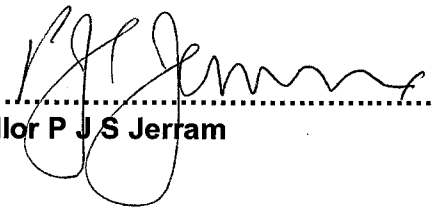
Commissioner R Crosby (Chair)



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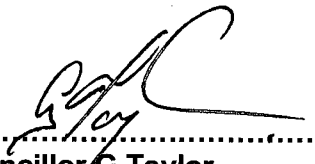
Councillor P J S Jerram



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Councillor G Taylor

Dated this 18 **day of** May **2010**

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MARLBOROUGH
DISTRICT COUNCIL

Marlborough District Council

Decisions in relation to

Plan Changes 23 & 58 to the MARLBOROUGH SOUNDS and WAIRAU AWATERE RESOURCE MANGEMENT RESOURCE MANAGEMENT PLAN

Use of Wind Machines for Frost Protection

1. Introduction

1. Wind machines for frost protection have become relatively commonplace around the Wairau and Awatere Plains with the conversion of large areas of pastoral land to viticulture. Wind machines for frost protection under the operative plan are permitted subject to meeting certain standards. However, there have been ongoing complaints in relation to noise from the machines operating during the night affecting the ability of residents in neighbouring dwellings to sleep.

2. When Council investigated the complaints a number of issues were highlighted with the rules in the operative plan relating to the use of wind machines. The Council came to the conclusion that that the rules in the plan were not effective in managing the issue and needed to be changed. On the 24th September 2009 the Council notified changes to the Marlborough Sounds and Wairau Awatere Resource Management Plans regarding the - *Use of wind machines for frost protection*, Plan Changes 23 and 58.

3. At closing of submissions, 26 submissions were received for Plan Change 23 to the Marlborough Sounds Resource Management Plan and 37 submissions were received for Plan Change 58, to the Wairau Awatere Resource Management Plan.

4. At closing of further submissions, a further 4 submissions to each of the plan changes were received.

5. On the 16 March 2010 the Environment Policy Committee delegated the authority to hear and make decisions on the two plan changes to a hearings sub committee consisting of Mr R D Crosby (chair) and Councillors Jerram and Taylor.

6. Mr R D Crosby is accredited under the Governments "Making Good Decisions" programme.

7. Hearings commenced for the two plan changes on the 22 March 2010 and closed for deliberations on the 24 March 2010. 20 people spoke to their submissions. Details of these appearances can be found in Schedule 1 of this report.

8. This report contains the Council's decisions on Plan changes 23 and 58 and the reasons for those decisions.

9. This report is broken into the following sections;

   (a) Introduction

   (b) Decisions and Reasons

      (i) 2.1 Decision summary

      (ii) 2.2 Background

      (iii) 2.3 Reasons and Decisions.

   (c) Schedule 1. Hearing Schedule

   (d) Schedule 2. Schedule of Changes

   (e) Schedule 3. Decisions on Individual Submissions.

2. Decision and Reasons

This Section contains the Council's decision and reasons under cl10(1) of the First Schedule of the Resource Management Act 1991 (RMA) [1].To assist the reader the decision has been summarised below in section 2.1. Section 2.2 provides a background to the plan change and Section 2.3 discusses the evidence presented at the hearing and provides the reasons for the Council's decisions on the individual submissions.

The decisions on the individual submissions can be found in Schedule 3 of this report, but will be omitted from the copies sent to the submitters, who instead will receive a specific decision letter.

2.1 Decision Summary

The decisions reached by the Hearing Committee include the following major points:

(a) Plan Changes 58 & 23 are accepted with an amended policy and rules as set out in the Schedule 2 to the decision to address significant adverse noise effects issues so as to enable people potentially adversely affected by new frost fans to be able to sleep.

(b) Sufficient acoustic and other evidence was available to make a full evaluation as required by s.32 of the Resource Management Act 1991 as to noise issues arising from the operation of single frost fans which the Changes address.

(c) Insufficient evidence was received to enable a full s.32 evaluation as to cumulative effects of frost fan noise which requires further monitoring on the basis of expert acoustic advice before any decision can properly be made as to whether a further Plan Change is necessary to address such potential adverse effects.

(d) The status of the activity of operating a new frost fan will be controlled to enable conditions to be imposed which address various operational issues and enable review of conditions.

(e) Expert acoustic evidence will be required from operators applying for consent of the ability for a new frost fan to meet the standards imposed in the actual location where the fan will operate.

(f) The noise standards imposed in the Plan Changes adopt 55 dBA Leq (15 min) as the standard that must be achieved within 300 metres of an operating frost fan.

(g) The modern New Zealand 2008 Standard of environmental noise measurement is adopted to enable single frost fan noise to be measured and the Standard's approach of measurement of Special Audible Characteristics to also apply.

(h) Reverse sensitivity effects from new dwellings requires that noise insulation measures are observed which will achieve a noise standard approximating 30 dBA Leq in bedrooms of houses in potentially affected sites.

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[1] Plan Changes 23 and 58 were notified prior to the enactment of the Resource Management (Simplifying and Streamlining) Amendment Bill 18-2 (2009) and the reasons and decisions have subsequently been written in accordance with the legislation of that time.

(i) The buffer distance for controlled activity status for a new frost fan in relation to urban related residential zones (which includes the Marlborough Ridge zone) is 500 metres and the buffer distance to the notional boundary of dwellings or rural related residential zones such as rural residential zones is 300 metres.

(j) Operational standards include requirements, based particularly on the evidence of better quality frost fan operators, that:

- The operation commences at no higher temperature than 1 degree.
- The operation ceases at 2 degrees
- Operation ceases if wind speed exceeds 8 kmh with automatic measurement required
- The speed of the tips of the blades must not exceed 340 metres per second
- Governors to control speed of operation are required
- Operation is only to be for the protection of crops from frostin the period from bud burst to harvest but with provision for daytime maintenance as required
- Vineyard staff trained in frost risk management procedures are required to be present on a vineyard where a frost fan is in operation, adopting a ruling of the Environment Court and evidence of best practice from good vineyard operators
- Temperature measurements are to be at the lowest fruiting wire for viticultural crops

(k) Requests for a standard requiring 4 bladed fans only and not two bladed ones were not accepted as having been sufficiently demonstrated as being necessary on the evidence heard from acoustic experts.

(l) Concerns from the viticulture industry as to the possible effects on presently non-complying frost fans having to meet the new standards were not accepted as being a sufficient reason for rejection of the Change. The operators themselves had the possibility open at any stage of seeking a Certificate of Compliance but have chosen not to do so.

(m) The "costs" to the viticulture industry on close examination were not sufficient to outweigh the strong "benefits" to those potentially significantly adversely affected by an inability to sleep if the Changes were not adopted.

(n) Enforceability would also be assisted if the new rules were adopted for frost fans but the Committee also believes that the single most dominant noise producing effect of excessive blade tip speed may be able to be more readily monitored. The Committee has urged Council under its s.35 monitoring obligations to investigate that method using digital photography and computer analysis.

2.2 Background

On 24 September 2009 the Marlborough District Council notified two proposed Plan changes affecting the Marlborough Sounds Resource Management Plan (MSRMP) as Plan Change 23 and the Wairau/Awatere Resource Management Plan (WARMP) as Plan Change 58. (As the Plan Changes are in fact identical in content for relevant purposes, all bar the numbering, throughout this decision they will be referred to in the singular as "the Plan Change", unless the context otherwise requires).

The background to the proposed Plan Change lay in a very significant increase in the number of frost fans that had been installed in reliance on permitted activity provisions contained in both Plans. That had led to approximately 1000 frost fans being constructed particularly on the

Wairau Plains, but also in the Waihopai Valley and the Awatere Valley. Whilst that had occurred predominantly over the last five to ten years there had been a very significant increase in the rate of construction in the last three years. On the evidence that we received the noise generated by those frost fans had not given rise to large numbers of complaints until after the spike in construction numbers, when complaints themselves increased as we will describe later in this decision.

That level of increased public protest at the frost fan noise had led to the Marlborough District Council facilitating a workshop in October 2008 which was chaired by a very experienced resource management lawyer, Mr John Maassen. He produced a report ('the Maassen report') dated 25 March 2009 following on from that workshop process. At the conclusion of his report from pages 18 & 19 onwards he outlined past difficulties with enforcement and monitoring of effects, and the difficulties in that regard that had been experienced stating in particular that:

"...this has been particularly difficult. MDC staff have to identify when wind machines are likely to be operated. MDC staff then have to monitor in the early hours of the morning. When monitoring is done it is in frost conditions when wind machines are operating. Identifying the noise generation characteristics of individual machines is problematic."

He proceeded to outline a possible way forward, suggesting at paragraphs 46 and 47 that particular study areas should be selected in what he described as recognised "hot spots". One of those, described in very general terms by him, is the Benmorven Estate, which is a somewhat loose description and rather difficult to define. Another he indicated could be in the Waihopai Valley where frost conditions are a significant risk, and where vineyard development is occurring in locations previously thought unsuitable for wine growing.

At paragraphs 42 & 57 he outlined a range of what he described as visual material, field work, questionnaires, micro-climatological analysis based on historical data, further field work and predictive analysis, and finally a study of any houses within 100 metres from a wind machine "*to determine the sufficiency of the 100 metre separation distance in the rural zone.*"

At paragraph 54 he summarised all of that as being "*forensic enforcement/monitoring*" which he suggested was necessary before any substantive change to the Plan could be justified. However, having said that, he then went on to say at paragraph 55 that there were obvious deficiencies in the existing Plan provisions that he had identified in paragraph 28 of his report, and that the then current noise performance standard in the Plan was deficient for the reasons stated in paragraph 25 of the report.

In summary, his identification in paragraph 28 of the difficulties with the permitted activity rule were that monitoring and operating conditions could not be imposed in terms of that rule prior to construction, and that there was no mechanism to insert conditions in a consent to review conditions, or to require the owner to adopt a best practical option for noise management. He said that the rule presented monitoring problems to Council, concluding:

"*MDC and therefore residents are therefore effectively on the back foot.*"

At paragraphs 24 and 25 he had identified that there was an ambiguity argument over whether or not the general provisions as to noise measurement importing a penalty in relation to special audible characteristics of 5 DBA could be applied to a specific rule such as rule 30.4.1.1.2.3 setting a limit of 60 dBA L10, which was a specific rule addressing noise measurement standards for frost fans.

He concluded at paragraph 26:

"*I consider it unsatisfactory that:*

a) the Plan has an ambiguous noise performance standard;

b) *acoustic experts cannot agree whether a wind machine produces special audible characteristics."*

All of that consideration had led him in his Executive Summary to recommend that there be what he had described as forensic enforcement/monitoring methodology applied "*to understand the scale of the alleged problem including its frequency and duration*", but at paragraph 5 on page 5 of the report he specifically recommended that:

"The permitted activity rules should be changed promptly so that:

a) *classification of the activity of constructing and operating wind machines is at least a controlled activity to enable the imposition of conditions that provide for effective monitoring by MDC and a requirement wind machine operators adopt BOP options in line with technological improvements;*

b) *the noise performance standard is 55 DBA L10 and no other penalty under NZ6802: 1991 for SAC applies."* (SAC meaning Special Audible Characteristics).

As a consequence the Council has embarked upon these Plan Changes addressing particularly the permitted activity status of the construction of frost fans, but at the same time the Section 32 analysis referred to the fact that having such a Change in place would enable far more accurate monitoring and analysis and hence would give rise to further information being available as to the effects of the noise envelope created by frost fans.

2.3 Decisions and reasons for the decisions.

The hearing of submissions and further submissions was held before a specially appointed committee of Council.

At the hearings the evidence given really fell into three categories. Two of those categories had an understandably partisan approach to the various issues raised by the Plan Change. Those persons affected by frost fan noise supported the Plan Changes in general terms supporting the change in status of the activity from permitted to controlled, and the viticulture industry, represented by New Zealand Wine Growers and a number of individual entities or individual vineyard owners, opposed that step. The other aspect of the Plan Change requiring that there be insulation of new housing to meet a certain standard, which was consistent with the standard to be imposed upon new frost fans, i.e. achieving a sound level within bedrooms so as not to disturb sleep patterns at night at a distance of 300 metres, was part of the Plan changes. There was limited evidence addressing that issue which of course was supported particularly by the viticulture industry interests.

The third category of more objective neutrality was provided by submitters such as Nelson Marlborough Health Services, Mr Peter Constantine (who is a senior resource management officer of the Marlborough District Council, who stated at the hearing that he had lodged the submission both in a personal capacity but also as a concerned officer of the Council), as well as the Section 42A writers Messrs Tony Quickfall, (on resource management issues), and Malcolm Hunt (acoustic expert). All of that more independent objective submission, evidence and reporting was of considerable benefit in a situation where otherwise evidence tended to probably understandably be from positions at extreme ends of the spectrum in each case.

Having said that we do record that there had been some very serious and detailed thought given to the evidence both by people affected by noise and by a number of the viticulture operators as to the impacts of the Plan Change and they gave very helpful and informative evidence. As we will describe in this decision the vineyard owners or operators from whom we heard evidence tended to be, we suspect, the better quality operators. We repeat the observation we made at the hearing that if all operators operated their frost fans in the manner that those persons did who gave evidence before us we do not think there would be a problem.

Sadly that is not the case, as is clear from the evidence from those persons who are affected by frost fan noise, many of whom gave evidence of a position of some despair, because the affects of the noise upon them and their inability to sleep. Those persons tended to be affected by frost fans much closer than 300 metres to their houses as the previous permitted activity rule enabled them to be located within 100 metres of a house within the rural zone but required they still meet the 60dBA L10 sound level at that distance from the frost fan – the measurement of which has proved difficult under the previous rules.

We suspect we were given far more detail in all of that evidence on some points than was available to Mr Maassen in his report. For example, we will detail the type of evidence that satisfied us that there was no need to carry out any further extensive forensic monitoring to be able to reach the conclusions that we have reached that the Section 32analysis is able to be made in relation to the matters the subject of the two Plan changes in most respects. The only area where we still had a limitation in that regard was in relation to the cumulative effects of noise. That, too, is addressed later in this decision.

The parties who appeared and gave evidence before us are listed in the First Schedule.

Decision process

Finally, the decision that follows addresses the principal issues that were raised in the submissions and further submissions, and is accompanied by a Schedule 2 of the amended rules that we have approved, and a Schedule 3 volume of the specific responses to the specific relief sought in the submissions.

Again as the rationale and reasoning for each of the decisions we have reached is common to both Plans we have not differentiated between the two. The only document where that differentiation occurs is in relation to the Schedule 2 of formal changes, which is produced in a tracked-change version.

We turn then to consider the first of the substantive issues that we have summarised into various relevant parts.

2.3.1.0 Legal Issues

As an introductory remark we need to observe that we have had regard to the Marlborough Regional Policy Statement but its more general regionally significant policies are of limited assistance to a consideration of a more precise issue relating to the effects of the operation of a particular style of rural machinery.

Where the RPS is of relevance is the stated method at paragraph 7.1.11 (c) as to the "*close monitoring and control of developments with potential for significant environmental effects*" so as to achieve the policy in 7.1.10 of enabling activities, and the policy at paragraph 7.1.12 encouraging diversification into new activities without "*undue barriers*" provided "*adverse environmental effects are avoided, remedied or mitigated*" – all these are issues of relevance to this hearing.

2.3.1.1 Policy Provision to Support Change Rules

The proposed Plan Change effectively addresses noise effect issues from the operation of frost fans both from the point of view of controlling and managing the direct effects of noise on other persons' sleep, and the reverse sensitivity effects of construction of dwellings in close proximity to frost fans. The overall objective of the Plan Change then is to enable the utilisation of frost fans for the control of the effects of frost on crops, while at the same time managing the effects on sleep of persons affected by the incidence of noise generated by the frost fans so as to protect their health and wellbeing.

Both of those are valid and proper factors to be taken into account under Section 5 as Part 2 matters meeting the purpose of the Act. The general thrust of the RMA as to how that Part 2 purpose is to be met, is in part by the mechanism of identification of issues, setting of objectives and policies in District Plans and then adoption of rules to give effect to those objectives and policies. Because there are essentially two objectives involved in this Plan Change, one being the control of the level of frost fan noise, and the other being the control of reverse sensitivity to the effects of that noise, it is necessary to have a base in policy or policies that achieve those objectives.

Submissions by Peter Constantine, and not quite so specifically but in general terms from viticulture submitters, sought that there be a strengthening of the policies in relation to the ability to generate frost fan noise. They asserted that the policy that was proposed on notification of the Plan Change tended to emphasise only the policy protecting against the effects of the noise of the fans and that that must not outweigh the overall policy of enabling and encouraging use and development of rural land, including standard methods of control of frost affecting crops. Mr. Constantine particularly sought by the relief requested in his submission a policy to that effect.

The Section 42A planning report writer Mr. Quickfall responded that he thought that there were already sufficient policies supporting rural activities contained within the Plan, and that the adoption of a further policy along the lines proposed by Mr Constantine was not necessary. Whilst understanding and appreciating the reasoning driving the submission made by Mr Constantine and the grapegrowing interests, we tend to favour the approach taken by Mr Quickfall.

That is particularly because of the readiness with which the Environment Court very recently in McLean v MDC (Muricata) C081/2008 was able to find that the existing policies of the Plan strongly supported the ability to utilise frost machines. At paragraph 45 of that decision the Court said:

"In short the applicant's argument, which we endorse, is that the changes made to the Plan by the consent order emphasise the importance of protecting the primary productive capacity of the land. As a result the pressure that might be present to accommodate "lifestyle" interests is required to yield to the normal activities of farming, including viticulture. Given the substantial contribution made by Marlborough to New Zealand's wine production and exports, this is clearly understandable at a local level, and indeed could be argued to be a matter of also national importance."

In reaching that conclusion the Environment Court had regard to two new policies inserted in the Plan by a recent consent order which added policies 2.7 then 2.8 into the policy chapter 12.

Policy 2.8 is particularly relevant to this hearing and it states as follows:

"***Policy 2.8***

To enable rural activities which might generate adverse affects such as noise or smell, to operate in rural areas in accordance with accepted practices without being significantly compromised by other activities demanding higher levels of amenities."

The Court went on at paragraph 41 of its decision to quote extensively from the first paragraph of the Explanation to the policy provisions at Chapter 12.2.2.2 of the Plan where statements appeared such as the following:

"*The inherent nature of land based productive activities, means that intermittently higher noise levels will be produced when agricultural machinery is being used, when stock is being moved or held, or crop protection mechanisms are activated.*

And further:

"Therefore, current amenity levels in the rural levels in the rural areas in Marlborough are characterised by fluctuations in amenity because of both routine and seasonal land based primary production and management practices. These fluctuations should be accepted as anticipated components of rural amenity values, particularly by those choosing to live in rural areas."

That led to a conclusion being reached at paragraph 58 by the Court as follows:

"Section 16 of the Act contains the overriding duty on every occupier of land to avoid unreasonable noise. However, what is to be regarded as a reasonable level depends always on the specific context and the provisions of the District Plan. Our conclusion is that noise levels of the type allowed by the Council's consent, are reasonable. Noise produced by the frost fans will further be "of limited duration" and "required by normal agriculture practice"."

The conclusion the Court reached in the context of that particular case (which related to fans adjacent to a rural residential zone) is encompassed in a number of its findings under Section 104 on that particular resource consent application, the last finding on which was expressed in the following terms by the Court:

"The infringement of the 500 metre limit from "any residential boundary" is of less weight when the residential zone in question is a rural residential zone, as the Plan makes clear that some compromise of urban amenities is to be expected if people choose to live in a farming area."

Under its Part 2 consideration the Court specifically found:

"Our conclusion is that the granting of consent for these frost fans (with amended conditions) will promote the sustainable management of natural and physical resources as defined in Section 5 of the Act. Such activity will promote the economic wellbeing of the people of the district without compromising their health and safety. By protecting crops the fans will enhance the life supporting capacity of soil. The proposed conditions will properly mitigate any adverse effects of noise."

In summary, the Court found no difficulty in accepting that there were supportive objectives and policies of a very strong nature for the operation of frost fans, and the creation of frost fan noise as part of the normal agricultural practices in the area. We do not think that it is necessary, therefore, to adopt yet a further policy when that was clearly able to be deduced by the Court in that case.

However, we think that there could be some melding of the objectives as proposed in the notified Plan Change with those existing recent policies, so as to ensure that the concern Mr Constantine expresses as to a potentially undue weighting being accorded to the control of frost fan rules is not perceived as the sole objective of the proposed Plan Change, but rather that the policies that accompany the proposed Plan change have a level of balance between the two objectives referred to at the start of the discussion under the sub heading. The consequent policy will be worded as follows:

"Policy 2.1 To recognise that, even with a reasonable level of mitigation to avoid significant adverse effects, activities permitted or provided for in rural areas may result in effects arising from the activity itself or from management practices, including noise, dust, smell and traffic generation, and other activities locating in the rural zone need to accept these effects.

2.3.1.2 Asserted Inadequacy of Section 32 Evaluation

In a wide ranging number of ways a range of submitters, particularly from the viticulture industry, asserted that the Section 32 evaluation made for the Plan Change was inadequate. The primary complaints related to the fact that there had not been any detailed monitoring of the nature proposed in the Maassen report; that there was no proper evaluation of the costs of the proposed changes and the proposed benefits; that the proposed benefits were purportedly

based on levels of complaint arising from frost fan activity which were themselves inadequate in number and range to justify significant changes in the Plan rules; that the analysis of the enforceability of the existing Plan rules was lightweight or inadequate and not justified; and that one of the asserted principal justifications for the Plan Change being to gather information was an inadequate or improper use of the rule Change process which was not appropriate to meet the purposes of the Act.

For reasons that will become apparent under specific headings throughout the course of this decision, we are of the view that even if there were aspects of those points of complaint that had merit as at the date of lodging of the submissions, the evidence that we have received has been sufficient in our view to remedy any inadequacies in the Section 32 evaluation. As a consequence our ability to assess costs and benefits, and to weigh appropriateness, has been adequately enabled by the evidence that has been available to us and at law that cures any asserted default in the original s.32 evaluation.

In particular, we have had available to us the evidence of two experienced acoustic experts, as well as oral comments from the Section 42A acoustic expert report writer Mr Malcolm Hunt. Mr Vern Goodwin from Nelson Marlborough Health Services and Mr Neville Hegley for New Zealand Wine Growers gave evidence. The overall conclusion that we reached, after hearing their evidence and after hearing Mr. Hunt, was that a number of the matters of complaint fell by the wayside once that evidence had been received. In general terms there was essentially unanimity between the acoustic experts on many points of relevance to our considerations.

Most importantly they were all in agreement that the effects of the varying types of frost fans were well known acoustically for each individual make and did not require further research to be ascertained. Their joint view was that the effects were measurable, and that the general range of effects at a distance of 300 metres was well known.

Furthermore, they were all in agreement with the methods proposed by the Section 42A report for insulating houses so as to endeavour to ensure that a noise level inside bedrooms at or about the 30 or 35 DBA level was able to be achieved. They were all in agreement that achieving those levels in the bedroom of a house would ensure that sleep was not unnecessarily affected.

They were also all in agreement that the World Health guidelines were of considerable assistance in endeavouring to fix what is a reasonable level of noise to ensure that sleep is not unnecessarily affected by the incidence of noise in a bedroom.

Moreover, the experts were in agreement that the speed of the tips of the frost fan blades was the crucial determinant in assessing the effects of noise.

They were also in agreement that the effects of wind, whether it be katabatic or advection wind, above levels of 7 kilometres per hour was to accentuate the noise effects, and that the operation of fans in those higher wind situations needed to be controlled. Given other evidence from good quality operators referred to later in the decisions we have accepted a standard of 8 km/hr for reasons later discussed.

Such a broad level of agreement amongst the acoustic experts was most important to the evaluation process of whether there was sufficient basis as a matter of evidence for a proper evaluation of the effects of benefits, costs and appropriateness of the proposed new rules to be undertaken.

Whilst they differed in some details:

- Mr Hegley suggesting 60 dBA Leq as contrasted to Mr. Hunt and Mr Goodwin 55 dBA Leq,

- Mr Hegley and Mr Goodwin seeking differing ways of trying to add in extra wording to cover cumulative effects and Mr. Hunt saying that was not necessary for this Plan Change given the ability with application of the modern 2008 standard to measure individual fan noise levels

- Mr Hegley suggesting a range of 25 dBA up to as high as 30 dBA reduction arising from the absorption factor of the average New Zealand house as contrasted to Messrs Hunt and Goodwin favouring the lower figure,

they were otherwise in broad agreement on all the issues that were relevant to our consideration.

The two major issues between the acoustic experts from those just outlined above was whether the appropriate level of noise to be met was 55 dBA Leq 15 min or 60 dBA Leq 15min at a distance of 300 metres from fans, and the treatment of cumulative effects.

In our view the former issue was more correctly assessed by Mr Quickfall in his final comment as being a planning issue for reasons we will later address, and on the latter issue as to cumulative effects we favour the view of Mr. Hunt. We return to address both of these issues in detail later in this decision.

Given all of that measure of agreement amongst the acoustic experts, we have decided there was no purpose served in endeavouring to carry out further monitoring as proposed in the Maassen report before undertaking the first stage recommended in that report of promulgating a Plan Change to address the effects of noise from individual frost fans.

The only issue was how far that should go in a cumulative effect sense. As will become plain in the next Part of this decision, on the evidence we have heard we formed the view that on the acoustic evidence currently available the cumulative effects that can be predicted were not demonstrated to be sufficient to require any attempt to control cumulative noise effects without further monitoring. The approach taken by Mr Goodwin and Mr Hegley was that there should be attempts to control cumulative noise effects in this Plan Change. We accept the assurance given to us by Mr Hunt that is not necessary, provided we accepted his recommendation that the modern 2008 noise measurement standard is the method adopted by the Plan Change, because that contains within it a mechanism for isolating out background noise enabling measurement of single fan noise only.

As outlined above in the Introduction, the Plan Change was notified on the basis of controlling the effect of single fan noise and measuring the effects of single fan noise. Given that fact, it is questionable whether there is lawful scope to try and extend out the controls to address cumulative noise effects, when the Plan Change as notified addressed single fan effects only, but in any event we think that is unnecessary for the purposes of this Plan Change. It is intended, as the Maassen report recommended, to address the immediate noise effect problems from individual fans that arise from the current inadequate or uncertain operative rules, so as to enable greater enforceability of the Plan rules for any new frost fans.

The other matters of complaint as to purported inadequacy of the s.32 evaluation will be addressed subsequently in the course of this decision. Suffice it to say at this stage that in respect of each of those matters we were satisfied that we received more than enough evidence to be able to reach conclusions on any areas where it was asserted that there was a significant inadequacy of information contained in the original Section 32 report. It is now well established case-law that the whole Section 32 evaluation process is able to be undertaken as a combination of the hearing and evidence process. That being the legal position, we were in a position to carry out the evaluation required by Section 32 in an adequate way so as to be able to make decisions on the appropriateness or otherwise of the proposed Change policies and rules, and the cost and benefits of the Plan Change.

However, before leaving this topic we should just briefly address the issue of whether or not the purpose of the Change, as was asserted by the viticulture interests, was as an information-gathering exercise only. We do not accept that is what was proposed. We are in agreement with the comments made by the Section 42A report writer at the conclusion of the hearing that the principal purpose of the Plan Change was to ensure that there was an immediate addressing of the need to control, monitor or measure and enforce individual frost fan standards that on the evidence we heard was definitely necessary at this stage. That was particularly so given the huge number and areal extent of the effect of frost fans that had occurred over the last 5 years in Marlborough.

The very facts that there have been community meetings such as were involved in the process of the formulation of the Maassen report, and the very level of detailed and serious evidence that we heard from members of the public in the course of this hearing, further support the fact that there was a need for the issue of the immediate effects of individual frost fan noise to be addressed.

That does not prevent in any way the ongoing monitoring of cumulative frost fan noise. In our view there is a continued pressing need to monitor cumulative effects of frost fan noise as we discuss later in this decision. That monitoring may or may not lead to a consideration by the Council of the issue of whether a further Plan Change is necessary to incorporate any rules addressing that issue. Until the information is gathered by way of a monitoring programme of cumulative effects of noise it will not be possible to reach any definitive conclusion about that issue. However, that current lack of monitoring of cumulative effects of noise does not undermine either the necessity for or the appropriateness of the proposed Plan Change provisions contained in Plan Changes 58 & 23.

2.3.1.3 Existing Activity Status for Existing Frost Fans Pre Notification

One of the major issues of concern raised by a number of the viticulture industry submitters was the risk posed by the proposed Plan Change provisions in the event that it was to transpire that any of the existing frost fan machines were subsequently found not to have been complying at the time they were installed.

The previous existing operative Plan rules provided a relatively simplistic regime of permitted activity status for frost fans in rural zones with the particular rule appearing in the WARMP at rule 30.1.4.2.3 under a heading "Wind Machines for Frost Control" which simply stated as follows:

"30.1.4.2.3. Wind Machines for Frost Control –

Any wind machine used for frost control shall be so constructed and operated that any noise omission measured at a distance of 300 metres shall not exceed 60 dBA L10 provided that:

a) The wind machine will be allowed to operate during the frost period danger period until the leaves of the plant are dry and the air temperature has reached 2°C;

b) The speed of the wind machine must be governed such that a top speed of the rotor does not exceed the speed of sound; and

c) The wind machine be located no closer than 500 metres to any residential zone, or within 100 metres of a dwelling house not located on the property."

Now the problem with that type of provision is that the industry has not bothered to obtain evidence of compliance at specific sites and has simply relied upon the fact that suppliers' specifications assert a noise level of 60 dBA L10 can be achieved at 300 metres from the particular machine in question, regardless of the topography or other features at any particular site. It seems there have simply not been any subsequent measurements or assessments by acoustic engineers engaged by individual operators that we heard about in evidence. Once

installed it seems no-one has had an acoustic engineer check that the noise emissions can in fact meet the 60 dBA L10 level at 300 metres in the setting in which they are located so as to demonstrate the permitted activity standard is met at the particular site.

Moreover, there is an inherent conflict in the operative rule between the purpose of setting a noise standard measured at 300 metres, and yet having ability, too, as a permitted activity standard, to locate a wind machine within 100 metres of a dwelling house not located on the property.

The consequence has been that in one particular case currently before the Environment Court Waihopai Holdings Limited v Marlborough District Council (ENV-2009-C8C-167) an abatement notice has been issued by the Council. The Council has maintained that both it and the Nelson Marlborough Health Services have carried out readings in that case which exceed the standard for the Amarillo type of frost fan used in that particular location by the appellant in that case. The Appellant contests that, again relying on the suppliers' general specification at the time of installation. That case is awaiting a fixture at the present time in the Environment Court.

The concern expressed on behalf of the viticulture submitters is that if the Environment Court comes out with a finding upholding the abatement notice in respect of that particular Amarillo type of machine then there are believed to somewhere in the order 300 of those machines installed at present in the Marlborough District. If such a negative finding is made as to its noise levels at 300 metres then arguably similar machines on the face of it may have a questionable existing use activity status, and it may expose those owners if it is subsequently shown that they could never have met the noise emission standard specified by the existing Plan rules.

However, the evidence we heard from the acoustic experts was that the decision in that case is unlikely to be applicable across the board without monitoring measurement at each particular location, because apart from anything else the whole issue of special audible characteristics will play a significant role in whether or not particular machines at particular locations attract the attention of that special audible characteristic provision. Moreover, their evidence was that the performance level and ground absorption factors applicable at particular locations other than the Waihopai Holdings site will vary.

On behalf of some submitters Mr. Murray Hunt argued that there would be a gross unfairness and a gross unexpected cost arising from the Plan Change provision in the event that the existing fans were not to enjoy existing activity status as they had believed they enjoyed for many years, as a result of any negative decision in the Waihopai Holdings case. His suggestion was that there could be a "*grandfather*" provision provided in the rules to enable a period of time, say two years, akin to the aquaculture moratorium process, so that a different type of fan blade might be able to be retrofitted so as to ensure that the existing fans did not lose their existing activity status. For those who particularly have sited fans within 100 metres of a residence in reliance upon the existing Plan rules he argued there could inevitably be a major problem in terms of the proposed rules in the Plan Change.

During the course of the hearing we invited the viticulture interests to refer us to any particular rule to support the argument advanced by Mr Hunt. We specifically provided opportunity for New Zealand Wine Growers Counsel to be able to put forward examples of any such grandfathering rule in other Plans. No such examples have been received of rules enabling non-lawful activities to adopt the existing activity status protection afforded by s.10.

We are concerned that the existing activity provisions in Section 10 and following in the Resource Management Act are worded in such a way that they do not lend themselves to endeavouring by Plan rule to enable the "grandfathering" mechanism suggested by Mr Hunt. We consider that status of activity is clearly fixed by statute and cannot be adjusted by a rule in the Plan. It is notable, for example, that the only moratorium Mr Hunt was able to refer us to was one which was created by statute itself, (the aquaculture moratorium), and that was also terminated by statute. Another example which Mr Quickfall referred us to related to the date of

commencement of a regional rule for the control of emissions from fires, but that was a situation of the creation of a new rule and the effective commencement date for particular types of activity under the new rule. That is quite distinct from the situation we have here where there are operative Plan rules in place made pursuant to a statutory process, with a proposed new Plan Change which has a date of notification with statutory effect that has already occurred, without this type of grandfathering concept.

Mr McGregor's examples for NZ Winegrowers were all, as he quite fairly pointed out, examples where the activity had originally been commenced lawfully so they do not assist either.

A further concern is that there was no relief sought in the submissions in respect of the type of 'grandfathering' concept suggested by Mr Hunt that in our view would be sufficiently wide to encompass that type of provision. But the main point is that we have concluded that such a rule cannot as a matter of law be lawfully included in a manner that changes existing activity status as laid down by statute.

Finally, we do not think that it is necessary, either as a matter of fact, or arguably law, to attempt to do that because of the provisions of Sections 10(1)(a)(ii) and Section 10(3) of the RMA. Section 10(1)(a)(ii) provides that land maybe used in the manner that contravenes a rule in the District Plan if the use was lawfully established before the rule became operable and:

" (ii) .... *the effects of the use are the same or similar in character, intensity, and style to those which existed before the rule became operative or the proposed Plan was notified.*"

Sub section 3 addresses reconstruction or alteration of an existing activity and provides that the section does not apply if the reconstruction or alteration "*increases the degree to which the building fails to comply with any rule or district plan or proposed district plan.*"

It seems to us as a practical matter that in the circumstances of a situation where compliance monitoring is unlikely to have occurred, that it remains open to any particular owner of a frost fan who is concerned about their ability to meet the compliance standard of the old Plan so as to be able to continue to enjoy existing activity status, to retrofit a different form of frost fan head or blade which is very definitely demonstrably able to meet the standard as prescribed under the old (or new) rules. Anything that is less in effect cannot fall foul of Section 10(1)(a)(ii) or (3) because if the effects arising from the alteration are less, then they will certainly not be of a greater character, intensity and scale and will not increase the degree to which the building failed to comply with the rule in the Plan.

Whilst it was not an argued point, and not necessary for the decision and therefore was an obiter statement, we respectfully adopt the views expressed by the Environment Court at paragraph 35 of the Waihopai Holdings Limited interim decision on the application for stay of the abatement notice when the Court said as follows:

"*At the same time the onus is clearly on a person who relies on permitted activities status in the Plan to demonstrate that their activity is compliant.*"

That has always been the position, but in the context of this activity the viticulture operators have effectively taken the approach of not seeking a Certificate of Compliance from the Council under Section 139, in reliance upon manufacturers' specifications. S.139 provides for a statutory mechanism whereby a person may request a consent authority to issue a Certificate of Compliance that the activity can be done lawfully in a particular location without a resource consent. That was the fail-safe option which was always open to the frost fan operators, but they seem to have chosen not to utilise it.

In this situation, the viticulture industry has taken upon itself the risk of not seeking Certificates of Compliance, and it is a consequence of that risk that if there is subsequent monitoring which finds there is no compliance with the existing rule, then the statutory existing activity status is

not gained. That leaves the operator in a non-complying situation where they do not have a lawfully established existing activity, and hence may be caught by the provisions of the new rules.

But that is an outcome of the past decision making by the operators, not as a consequence of the Council proposing the new Plan Change. It was the decision of the operators, either individually or collectively, not to seek or obtain Certificates of Compliance which has left them in that position.

As stated above they still have an option if they feel exposed at any time prior to, or for that matter post the Environment Court's decision in the Waihopai Holdings litigation to ensure that they can comply. If need be, that may require retrofitting complying equipment so that they are in a position of arguing that they have a lawfully established activity capable of meeting the standards in any event. As a standard, even with the Plan Change adopted as notified or in similar terms, the standard remains much the same in broad terms whether under the old rules or under the proposed new Change.

For the reasons outlined we do not believe as a matter of law that we are entitled to try to correct a self-induced problem by a 'grandfathering' clause, when there is no statutory mechanism that we can see that enables it, no evidence available of such 'grandfathering' clauses having been utilised in other situations, and where no relief sought that outcome in the submissions.

2.3.1.4 Change in Noise Measure Standard

In respect of this issue there was a large measure of unanimity between the acoustic experts that the modern noise measurement standard method should be adopted which is the Leq 15 minutes as contrasted to the dBA L10 method used in previous standards.

The difference in short summary is between a method measuring in effect 10% of the peaks of noise, as contrasted with a method that more closely approximates the median noise measured over a period of 15 minutes. The consequence is that if one applied the same numeric figure of 60 dBA for the Leq as applied to the L10, then there would be a lessening in protection against excessive noise by an amount of between 2 and 3 decibels.

The alternative option is to decrease the numeric from 60 to 55 which results in an actual difference again of 2 to 3 dBA, but in a way that increases the protection rather than lessens it.

Given the overall objective of protecting sleep that is one of the features underlying the Plan Change, we have decided it would be quite wrong to have a Plan Change adopting a new more modern measurement system under contemporary standards in line with both new international and new New Zealand standards, but one which lessened the protection rather than increased it slightly within adjoining residences.

We have, therefore, decided that that militates in favour of changing the numeric as recommended in the Plan Change and the Section 42A report to 55 dBA whilst adopting the Leq 15 method of measurement, which has an effect of lessening the noise impact slightly as compared to the previous dBA L10 method of measurement.

While the overall outcome is a slightly greater restriction on the noise level able to be produced by the machines, on the acoustic evidence we heard, that change is less than or only just at the level of change that is perceptible as a change to the human ear. Moreover, "the cost" to the industry from adopting that system is more than offset in our view by the advantages to the industry of having a Plan Change in place imposing insulation standards of new houses, which ensure that they are capable of meeting the new measurement standards if such new houses are to be constructed near existing frost fans.

2.3.1.5 Reverse Sensitivity Issues

There were a range of further reverse sensitivity issues raised by various submissions including that the reverse sensitivity insulation standards necessary raised issues as to the ability to ventilate the house to the necessary extent in bedrooms. We have concluded that those issues of balancing ventilation and insulation matters are best dealt with by the Building Code, and there was nothing specific raised in evidence that we could rely upon in imposing any further rule response to that issue.

The suggestions by New Zealand Wine Growers that there should be a 1000 metre requirement for noise sensitivity activities to establish, as suggested in paragraph 7.1 of their submission, we considered is unreasonable and not warranted on the evidence at all. The 300 metre standard is all that we regard as necessary, apart from the 500 metres from residential zones.

We accept there is an argument that needs addressing on that issue, as that 500 metre buffer on its face appears to be inconsistent with the 300 metre measurement distance. There is a strong argument given the Environment Court's views as quoted above in the Maclean case that from Rural Residential zones the buffer distance should be 300 metres. From residential zones, however, throughout the Plan both in terms of the existing rules and the proposed Change, that buffer of 500 metres has always been extant. The approach taken consistently in the Plans has been that where there are major concentrations of residential dwellings, people are entitled to expect residential amenity.

Where there is a question mark arising over cumulative effects, (which we address later in detail), we have decided that the most appropriate way of dealing with the buffer issue between major residential locations and rural noise from frost fans is that the 500 metre figure should be adhered to at this stage. That will ensure people in residential zones enjoy the residential amenity they are entitled to, until monitoring of cumulative noise demonstrates that buffer is not needed, if that was ever to eventuate.

There was a more extreme suggestion by Mr R Ryan's submission that there should be a requirement to be able to achieve a 35 dBA level if a frost fan was within 3 kilometres. It will be very obvious from the above discussion that we think that that is far too extreme, not appropriate, and not supported by the evidence.

As to those submissions that there should be rules requiring a LIM to issue advising purchasers of rural land of reverse sensitivity insulation requirements for new dwellings, that is a practical matter for administration of LIMs by Council. It is not appropriate in our view to endeavour to impose that as an obligation on the Council by rules in the Plan, and it is not necessary in terms of meeting the objective of protecting against noise emitting from the fans, as insulation of new buildings is well known to be required under the Building Code in any event. We make the very obvious point that in the South Island the insulation requirements under the Building Act mean that the insulation likely to be necessary to achieve the rating that would result in a 30 to 35 dBA environment within bedrooms, is required nowadays anyway by double glazing and increased insulation requirements in new buildings.

2.3.2. Policy Issues

2.3.2.1 Areal Extent of Land Affected by Plan Changes

The arguments advanced by the viticulture industry as to the effect of the proposed Plan changes covered a broad range.

At one end of the spectrum a rather emotive picture was painted by some of the New Zealand Wine Grower witnesses, particularly Messrs Gregan and Smith, that there could be catastrophic effects on the ability to protect viticulture land from the effects of frost because of the Plan Change provisions.

Others, such as the interests represented by Mr M J Hunt appearing for the Van Asch interests, posed the serious concern arising from the outcome of the Environment Court litigation over the abatement notice issued in respect of the Waihopai Holdings Amarillo fans. The concern raised was that there could be large areas of land, currently believed to be protected by frost fans that enjoyed existing activity status, which could be exposed to the new Plan Change provisions if it was held that that particular type of fan, in fact, never complied with the previous rules. If that was the Environment Court ruling then the consequence was an exposure of all such Amorillo owners to an argument that no lawful activity had been established. It was argued that could leave substantial areas of land, currently believed to be lawfully protected by frost fans of that nature, unable to be protected without undergoing resource consent application processes.

Another area of concern was identified particularly by Mr P McLeod for Pernod Ricard when he outlined to us the ongoing micro-mapping analysis that was occurring in their extensive vineyards for frost exposure risk, with assessments being made from time to time as to the need to protect further areas. He gave evidence of one further fan having to presently undergo the resource consent process under the Plan change provisions with the attendant costs, delays, and uncertainties involved in such a consenting process.

Finally there were strong assertions in the submissions as lodged of there being substantial extra areas of currently undeveloped viticulture land which would be suitable for development for viticulture, but which would need frost protection by the use of frost fans. That proposition was not directly supported in the evidence we heard, doubtless because of the current severe economic downturn for the viticulture industry.

All of these points, advanced either individually or in combination, were submitted to be part of the broader "cost" to the industry of the adoption of the proposed Plan Change which cost it was asserted in the course of the criticism of the s.32 evaluation had not been taken into account in that evaluation as a cost of adopting the Plan Change.

It is clear on the evidence we did receive that there will be, at the very least, an ongoing process of micro-evaluation of frost risk on individual vineyards in the manner described by Mr McLeod, and that any further frost fans sought for existing vineyards would be affected by the proposed Plan change. There is a large area that is potentially likely to undergo that detailed frost risk analysis. There was also anecdotal evidence of a change in the increased incidence of frosts over the last 10 years as compared to the two previous decades, which suggests that that may also give rise to a significant "new" area of existing viticultural land that would be affected by the adoption of the Plan Change.

It is obvious that there would be an effect on any new areas of viticulture land that needed frost protection. Notwithstanding that the current evidence was of a significant downturn in crop returns, sufficient to raise doubt as to the extent to which there will be any real practical expansion of the viticulture industry in an areal sense for the reasonably foreseeable future, nonetheless it is a potential possibility. Over the planning period one could not, and should not, discount such expansion as being a potential "cost" for the industry to have to face extra the inherent costs of further regulatory control as proposed in the Change.

We do not, however, accept the more extreme angle placed on the areal extent of risk or "cost" asserted by New Zealand Wine Grower witnesses. The reality is that the great bulk of the frost prone areas, as the industry stands at the present time, already have in place frost fan protection and there is likely to be a significant plateau of installations from this time on. So while we do not totally discount the need for protection of increased plantings, we think on current evidence relatively little weight should be given to that 'cost' factor.

2.3.2.2 Nature of "Cost"

The argument that there is a significant "cost" in the s32(4)(4) sense which has not been taken into account in the s32 analysis accompanying the Change requires, however, a far broader consideration than merely the areal extent of the affected application of the Plan change rules

as proposed, and the commercial cost to the industry. That commercial cost is but one of the considerations required to be taken into account in terms of s.32, which requires an evaluation of the extent to which the objectives of the Plan Change is the most appropriate way to achieve the purpose of the Act, and whether the proposed Plan Change rules are the most appropriate means of achieving the objectives, as well as the full range of benefits and costs of the proposed Change, and the risk of acting or not acting if there is uncertain or sufficient information about the subject matter of the Plan Change. Other aspects will be addressed in other sections of this decision, but this particular sub-heading addresses solely the argument as to actual extra commercial cost to the grape grower from the imposition of the Change. As to that one has to look at the practicalities of what is actually the consequence of imposing the Plan Change rules as proposed as a cost to the grape growers.

The first "cost" that arises is the requirement for a resource consent application to be made. That carries with it a significant cost factor both in terms of direct cost by way of payment of consultants' fees or in-house staff time for research and preparation of the application, and delay factors and uncertainty inherent in relation to vineyard planning, dependent upon the outcome of the application and the conditions imposed. The latter issue as to uncertainty of outcome which was stressed by many of the viticulture witnesses we consider to be of no great weight.

The status of the activity proposed is controlled activity status, and of course it is a very significant factor of a controlled activity status under s.87A of the RMA that a resource consent must be granted. Furthermore, the consent authority's power under s.87A(2)(b) to impose conditions is restricted to matters over which control is specifically reserved in the Plan, so that there is no uncertainty as to the matters that will be the subject of conditions, most of which will relate to operational issues as outlined in the proposed Plan Change.

Any non-compliance with any of the standards for a controlled activity status is a trigger not for non-complying activity status, as was suggested to us in a submission by New Zealand Wine Growers, but in fact is a trigger for discretionary activity status. Once again that hurdle is not insuperable, provided the objectives of the Plan, rules and Part 2 matters of the Act are taken into account.

In summary, then the arguments based on uncertainties arising from the activity being subject to a resource consent process do not carry significant weight.

Turning to the direct costs, we think there is more scope for argument in the way in which the case has been presented to us. There is a significant cost factor in direct cost terms in the preparation, lodging and if necessary, appearing in relation to conditions on resource consent applications. In addition the costs charged by the Council are not insignificant.

The imposition of the Plan Change ensures in a costs and benefits sense that there is no risk to existing houses from placing a wind machine further than 300 metres from any existing house, and that there will be increased standards to be met which will require the lodging of an acoustic expert's report verifying that the frost fan machine proposed will comply with the noise standard at 300 metres from the machine in the particular location it is to operate – a factor currently absent from the present operative rules. Subsequently if an adjoining owner was to wish to construct a house within 300 metres of that machine, in terms of the proposed Plan change, it would require that the proposed new house was insulated in such a way as to ensure that the dBA level was still capable of being achieved – again a factor currently absent.

In our view that is a much fairer outcome than the current Plan rules which are inadequate as described above. At present the unsatisfactory situation exists that a frost fan can be constructed within 100 metres of a house in a rural zone which increases very substantially the prospect of the machines not being able to meet the noise standard at such close proximity, and there is a very significant further added unfairness if the existing house is old and has no noise insulation. Equally, the current rules are unsatisfactory in that any new house can be

constructed within an adjoining property which has the effect of placing the new house within such close range of a frost fan that the realistic outcome is going to be a reverse sensitivity to noise created by the position of the house. Under the new rules any such new house would be required to demonstrate in terms of the plans before the permit was issued an ability to be able to meet the noise standards required to ensure that a level of sleep protection at 30dBA or thereabouts was able to be achieved.

2.3.2.3 Cumulative Effects

We heard a significant body of evidence from affected landowners/submitters who complained that the introduction of substantial numbers of frost fans into an area lifted the overall noise. Mr Hyson also gave evidence that his house has machines close to it, but is at a slightly elevated location so that he has often situations occur where the machines close by are not operating, but he asserted the cumulative effect of noise from more distant frost fan machines was significant and that disturbed sleep.

In addition to that evidence we did have evidence from Mr Vern Goodwin from Nelson Marlborough Health Services to the effect that in his view there were cumulative situations where that could occur. He gave us a demonstration of an overlap of the effects from three possible frost fan locations in relation to one particular house where an increase in sound level of 5 to 6 DBA could be calculated to occur. We interpolate here that it was of significance, even in the example that Mr Goodwin gave us, that to achieve this overlap of three frost fan noise effect radii affecting one house, it was necessary for him on the right-hand vineyard in his diagram to actually move the frost fan closer to the house into an illogical position for the boundaries of the vineyard so as to be able to show the overlap affecting the house as a third overlap radius from a frost fan. The need for Mr. Goodwin to do that rather emphasised the point made by Mr Malcolm Hunt, the s42A expert noise report writer, who emphasised that the separation distances likely between frost fans would be unlikely to lead to situations very often occurring where any more than two close frost fans were providing a cumulative noise effect of significance. Even then, Mr Goodwin's example only increased the cumulative effect by a far lesser amount than was calculated by the lay witness Mr McLean who gave calculations of substantially increased cumulative noise carried out on what Mr Hunt described as a more simplistic calculation not properly taking into account ground absorption factors. As we understood it the addition of substantial frost fans at a distance is significantly reduced by such factors.

Our conclusion on the evidence we have heard is that it is incontrovertible that there is an increase of cumulative noise as a result of the substantial number of extra fans that are in place, (and Mr Hegley for the New Zealand Wine Growers was also in agreement that there was a cumulative noise effect). However, on the basis of the acoustic expert evidence that we heard, the increase in that cumulative noise effect at any particular house, given the separation distances between the fans, would only marginally, if ever, be above the 3dBA increase which all the acoustic experts describe as being the level at which one notices a significant change in noise effect.

In short, it is plainly obvious that in comparison with the pre-existing situation of there being no frost fans in an area, the inclusion of a significant number of frost fans is going to lift night-time noise from probable levels of a range of 30 to 40 dBA outside to a range of 55 – 60 dBA. That in itself is a significant change, but the question that needs to be answered in detail is whether the increase in noise is so significant that it will be disruptive to sleep. On the evidence we have heard, we have concluded that there is insufficient evidence available at this stage to warrant considering specific provisions relating to the cumulative effect of noise because the acoustic expert evidence simply does not support that proposition.

What the acoustic expert evidence did establish was that it was highly likely as more frost fans were put in place, that whilst the overall dBA level would only increase slightly, what would occur with the differing rotation patterns of the differing machines would be that the highs and lows of one or two close machines might be smoothed out into a more continuous noise at a

similar level. But importantly it would be at or about a similar upper noise level, or most probably on the evidence we heard, no greater than an extra 3-5 dBA.

Having said that, we do acknowledge that that is an area that has not been measured to any great extent in Marlborough, probably because the significant extra cumulative effects at locations such as to either side of the Benmorven Ridge, in the Brancott Valley, the middle to upper Wairau Valley and Waihopai Valley have occurred over relatively recent years. Much denser levels of frost fan activity occurs now in all those areas, as was graphically displayed for the Ben Morven area by informative plots provided to us by Mr. Maclean. The measurement of that cumulative effect of noise appears not to have been done in any scientific way. The acoustic experts' views have been that the noise absorption factors of the distances involved, given the separation distances between fans, will mean that there is not a significant increase in the level of overall noise sufficient to disturb sleep, other than in the rather unusual circumstances sought to be demonstrated to us by Mr. Goodwin with his plan of three overlapping noise effects.

However, given the evidence of the apprehensions and concerns of persons living in the areas affected, and given the very high level of density that we accept from witnesses such as Mr McLean as to the very large number of frost fan machines that have been placed in various locations, we echo the views that were expressed a couple of years ago by Mr. Maassen's report. We are of the view that it is necessary in respect of that cumulative effects issue for the Council to undertake, as soon as it possibly can, a detailed monitoring of the cumulative effects of noise to see whether any further Plan Change is required to institute rules addressing cumulative noise effects at any particular locations.

Whilst we are sure that the Council does not need reminding of its monitoring obligations in respect of this cumulative effect issue, section 35 of the RMA has a mandatory obligation that every local authority "*shall monitor*":

"(a) the state of the whole or any part of the environment of its region or district to the extent that it is appropriate to enable the local authority to effectively carry out its functions under this Act..."

The evidence we have heard from the affected residents makes it plain that the level of anxiety is such that it is appropriate for urgent consideration of a detailed method of monitoring of the effects of that cumulative noise effect. That is needed to verify whether or not the reality as measured by experts, reflects the present predictive expert opinion that it is not sufficient to significantly affect sleep patterns.

This part of the environment has been identified in the Maassen report as requiring further monitoring and investigation as to cumulative effects. The need for that was reinforced before us not only on the evidence of the residents, but also on the evidence of Mr Goodwin for the Nelson Marlborough Health Services who identified cumulative effects as being something requiring further addressing by planned measurement.

For the purposes of the present Plan Change, however, it is our view that the evidence does not take the issue sufficiently far at the moment to warrant any particular new rule being imposed addressing that particular cumulative effects issue at this stage in the Plan Change.

2.3.2.4 Level of Complaints

There was a significant challenge by the viticulture interests to the Plan Change provisions on the basis that there was insufficient evidence of complaint background to require adoption of a Change. It was asserted that the very low level of complaints through to 2008 demonstrated that that was the position.

However, the figures that we received in relation to 2009 reflected an outcome of substantially increased numbers of frost fans being constructed in Marlborough over the last two years. We asked for a breakdown of the number of individual complainants, and the number of properties

affected, and it was plain from that breakdown that there had been a significant spike not only in the number of frost fans constructed, but that was reflected in a spike in the number of complaints. There was essentially a fivefold increase in the number of complaints in respect of frost fans, and a doubling of the number of properties that were affected.

Those complaints received or recorded by Council are probably the tip of a level of discontent with the complainants, being complaints from those particularly badly affected and sufficiently so far affected as to cause them to lodge complaints the following day or days at a time when the Council offices are open. In the usual course Council offices will only be open to receive complaints after the noise has actually ceased. Those persons taking the trouble to still lodge those complaints are sufficiently affected to take the trouble to undertake that process of formal complaint. (We believe that it is a reasonable assumption that there will be many others who are equally affected, but who have not taken the trouble to necessarily contact the Council and lodge a formal complaint.)

But even if one ignores that possibility, and takes into account only the complaints actually formally lodged, there is a sufficient body of evidence of concern, and significantly increased concern, as a result of the increased numbers of frost fans in our view to form a proper basis to the conclusion that there is a significant benefit to the wider community in terms of protection of sleep to adopt a Plan Change along the lines contained in Plan Changes 58 & 23. That evidence is sufficient for the purposes of the s.32(4) consideration of benefits to answer the criticism levelled by the viticulture submitters.

2.3.2.5 Challenge to Rationale of Unenforceability of Existing Rules

Another issue raised by viticulture interests in criticising the proposed Plan Change was the assertion underlying the Change that there were difficulties in enforcement of the existing rules. Those advancing this argument pointed to action such as the current enforcement action against Waihopai Holdings by the Marlborough District Council as evidence that in fact sufficient evidence in appropriate cases can be gathered and utilised as a purported base to an abatement notice or enforcement action.

Against that proposition, though, we have clear evidence that the reality is that that has been a very rare event. We have also heard evidence from the noise experts, which was uncontroverted, that it was very difficult in terms of the standards of measurement in the current Plan rules, to be able to sufficiently isolate out specific noise from one particular fan, if there was either other background fan noise, or other background helicopter noise which could be said to be influencing the noise results.

We were informed by the s.42A expert noise report writer Mr Malcolm Hunt, and rely in this decision on that advice, that the proposed new measuring standard in the current 2008 New Zealand Standard enables a mechanism of isolating out such other noise when measuring the noise effects from an individual fan. That will mean that the measurement of noise from individual frost fans can be accurately established enabling abatement or enforcement action to be taken in appropriate cases. That alone, in our view, is such a significant change in outcome, and 'benefit' in s.32 terms, as a result of the adoption of the Plan Change as to warrant its adoption.

At this stage we wish to repeat the point made earlier that almost without exception the grape grower/frost fan operators from whom we received evidence were all clearly abiding by both the existing standards in the Plan and also the Winegrowers voluntary Code of Practice. That meant that their management practices constituted good sound environmental practice in the way in which they carried out their frost mitigation.

Sadly, the frost fan noise issue has arisen in this district not because of such exemplary operators, but because of those who arguably do not meet those standards. When that occurs there is clearly a body of evidence of significant effect on sleep for those persons affected as an outcome of the lack of compliance. But the ability to monitor that has been so restricted by the

inadequate Plan rules to date that it has meant that there has not been able to be achieved the level of compliance that is necessary to ensure that peoples' sleep is not affected.

This Plan Change may not prove to achieve that in 100% of cases, but what it will do is ensure that the situation is definitely not exacerbated as new frost fans are installed, because of the new standards that are proposed. Moreover, the new rules will enable a far greater accuracy in the method of measurement so as to ensure that compliance with the Plan rules can be verified in respect of the ongoing operation of new fans. That, too, is a very significant 'benefit' in a s32(4) sense that can and should be taken into account in favour of adopting a Plan Change. Furthermore, the cost of not adopting the Plan Change will be to continue to have the same inadequacies apply to all new fans as has occurred in the past, which will merely add to the loss of sleep for newly affected people.

Whilst it is not essential to this Plan Change consideration we also wish to record that that almost without exception the operational standards we have adopted accord with the best practice type of evidence we heard from the better, more careful and experienced operators such as Mr. Lissaman, Mr. Smith and Mr. Van Asch, to name but some. There is nothing significant imposed by our decisions which takes matters beyond the actual best practice methods they adopt in the manner they operate their frost machines. We, therefore, venture to suggest that when Council considers complaints of excessive noise under s.16 of the RMA in future, against that body of evidence of best operational practice it may consider, for example, whether noise is unreasonable if frost fans are operated at 3 degrees Celsius, when it is plain on the evidence that no protection from frost damage is achieved warranting the high level of noise at that temperature. Similarly, other standards imposed are also based on evidence of what is best practice needed to create the high level of noise for the minimum reasonable time to protect crops against frost. If the noise is not warranted to protect crops from frost then it may well be found that to create noise of that level is not the best practicable option in terms of s.16.

Before leaving this issue we wish to comment on a body of evidence we received from Mr Malcolm Maclean about a method of measuring the speed of frost fans so as to ensure they were not exceeding the speed of sound. He described to us that with the use of digital technology he could film a fan in operation in early daylight hours while the machines were still operating, then use his computer to slow down the revolutions and measure the number of revolutions per second and literally in a few minutes have definitive evidence of the speed at which the tips of the blades were rotating. He said he had found numerous examples of such fans exceeding the speed of sound. He also gave evidence to us that he had provided the details to the Council as to how that monitoring method worked and could not understand why it was not being used as a basis for abatement notices or other enforcement processes.

Given the conclusions we have reached about the importance of governing frost fan blade tip speed to reduce noise effects, we strongly express the view that Council should urgently seek expert advice on whether Mr Maclean's methods are accepted as valid, and if so utilise that method urgently. If the findings reflect Mr Maclean's that would enable consideration of enforcement or abatement action being readily taken under s.16 as it is plain that any exceeding of the speed of sound is causing unreasonable and unnecessarily increased levels of noise on the acoustic evidence we heard.

The other point we do believe on the evidence needs further consideration by Council is a better method of responding to noise complaints effectively at the time the complaint arises.

2.3.2.6 Challenge to Special Audible Characteristics Provisions in Measurement or Standards

The proposed Change, as we understand it, would introduce a reference to New Zealand Standards which have the effect of changing the position from being the imposition of a penalty on the noise level as contained in the old standards by a subjective assessment, to an addition of what amounted to a penalty as a result of a method of objective measurement of the sound of special audible characteristics.

We reject the suggestion that there are no special audible characteristics to certain of the frost fans that are in operation, because there was unanimous agreement from all of the acoustic noise experts before us that such special audible characteristics can be measured under the new standards in an objective manner. Against the background of that acoustic noise expert evidence, which was again uncontroverted, it is simply unreal to suggest that one should ignore the special audible characteristics where they exist, and where they may constitute an added factor of significance that might affect sleep patterns - which they clearly have the potential to do at a level of 5 dBA.

For us to try to remove them would be wrong against that background expert evidence. Moreover, to attempt to do so would require us attempting through rules in the Plan to vary the modern method of measurement of noise contained in contemporary national standards that are consistent across the country and designed to ensure the protection of sleep. We are not persuaded at all by any of the evidence we heard from the grape growers that there was any valid reason why we should do that.

A further benefit of adopting that modern standard of measurement in the specific noise standard for frost fans is that the modern standard should remove the ambiguity that caused the Maassen report in part to recommend an immediate Plan Change.

2.3.2.7 Operational Controls

There was an argument advanced in relation to two aspects, namely the speed of the frost fan blade tips, and the effects of wind on that factor, which were debated as between the various positions adopted by the differing sides and the acoustics experts.

The three acoustic experts were in agreement that blade tip speed was the crucial determinant of the high levels of noise that were produced by frost fans, and that those needed to be kept below the speed of sound. We have accordingly agreed with the approach taken in the Environment Court in the Maclean v MDC (Muricata) C081/2008 at condition 6 that the blade tip speed of each fan shall not exceed 340 metres per second at any time.

There was agreement between the acoustic noise experts that either katabatic winds or advection winds above 7 kilometres per hour can lead to effects on the blade tip speed that change the nature of noise and potentially increase it significantly. For a host of reasons, both operational, (Mr Smith for example for New Zealand Wine Growers giving evidence that the efficiency of the blades decreases in those higher wind conditions), as well as the increased noise issue, the Winegrowers own Code of Practice states in paragraph 4.1 bullet point 3 that the operation of a wind machine should be avoided when winds are at 7 kilometres per hour or greater. It is clear then on the evidence before us that there needs to be a restriction imposed on the operation of wind machines at or above the 7 kilometre per hour speed or near that speed. For reasons we address later in our discussion of operational standards we have accepted evidence of an 8 km per hour wind speed as being a cut-off requirement.

2.3.2.8 Purpose of Frost Fan Protection

The primary purpose of frost fan protection is for protection against frost. There was some evidence before us, though, of extra uses being adopted by some growers in relation to crop drying and protection of young vines. In fact Mr. Constantine's submission actually sought a broadening of the activity to enable the use of fans for crop drying purposes.

The evidence from Mr Smith, President of the New Zealand Wine Growers, was that crop drying was ineffective by the use of frost fan machines, and it was clear that there was no great level of support from the New Zealand Wine Growers for that type of activity. On the evidence that we heard there is insufficient evidence of cost to the viticulture industry from restricting the protection operations of the frost fans to any other purpose other than the formation of crop and protection of crop from frost.

Accordingly, in our view the Plan Change provisions should endeavour to ensure that the operating standards are worded in such a manner as to enable protection only through the period from bud burst to crop harvest, and not for crop drying or purported protection of young vines within or beyond that period. There was no evidence supporting effective use of frost fans for those purposes. That approach accords with the approach taken by Mr Hegley the acoustic expert for New Zealand Wine Growers who emphasised the effect that lessening the number of hours of operation would have on people affected by frost fan noise. That approach appears to us to be sound and in accordance with common sense that the lesser scope that there is for extended periods of operation, the lesser the likelihood of significant adverse effects on sleep, or high levels of annoyance sufficient to give rise to rural sensitivity issues. It follows that if the Plan Change is restricted to a particular purpose of frost protection of the crop from bud burst to harvest, and excludes other activities not related to that function, then on the evidence we heard that will restrict the hours of operation that are necessary to such limited levels that one would trust that event levels of annoyance will reduce markedly.

2.3.3 Interpretation Issues

2.3.3.1 Appropriately Qualified Acoustic Engineer

Some viticulture submitters queried the meaning of this phrase, but in our view it is an appropriate phraseology similar to that used in other settings within the resource management plans of this Council. The appropriate qualification will obviously relate to some form of acoustic engineering qualification, and we do not think that the Council will have any difficulty in interpreting or applying that.

2.3.3.2"Habitable Building"

Concern was expressed by the New Zealand Wine Growers and viticultural submissions that this phraseology might be utilised by objectors to frost fan noise to assert that particular buildings on an adjacent property maybe "habitable", and hence that sound level compliance must be measured at the notional boundary of that particular building, notwithstanding that as a physical fact it may not be occupied as a habitation.

Once again we do not think this is a major issue. In a practical sense the application of the interpretation of the phrase is realistically able to be verified quite readily. It is going to be readily apparent either from plans for new buildings, or from the existing set-up, lay-out and use of existing buildings as to whether or not they are habitable as a matter of fact.

2.3.3.3 Point of Measurement

The New Zealand Wine Growers submission particularly sought that the notional boundary closest to a fan be specified as the location at which noise measurements were to be taken. The "notional boundary" concept is widely used in resource management plans and widely used in the resource management plans of this Council. We do not consider that it is appropriate for us to endeavour to limit in any way the application of measurement of noise in relation to notional boundaries in a manner that differs from the way in which it is interpreted and applied throughout the resource management plans in this district and in other areas.

The reality is that the measurement is mostly likely to be taken obviously closest to the fan because that will be the most at-risk area on the notional boundary, but we do not think that that requires us to make any definitive attempt to change the wording on what is a broadly used descriptor of the point of measurement of noise affects.

2.3.3.4 Frost Fan Definition

There was criticism in the Clintondale submission of the reference to mobile frost fans with a strong assertion that frost fans were all fixed. That may well be so at present, but in the unlikely event that any mobile system was ever devised and utilised we think it is appropriate to retain

the wording. It is very obvious from the whole reason for these hearings being necessary, that to have no appropriate rules in advance leads to risk of noise generation being relatively uncontrolled. It certainly causes no cost to the viticulture industry from having that wording including control of noise from mobile fans in case they come on the scene in some manner.

2.3.3.5 Leq Time Measurement

There were some differences in the submissions as to whether or not a 10 minute or 15 minute time period should be specified for the Leq. All of the acoustic experts were in agreement with 15 minutes and we adopt that time span.

2.3.3.6 Frost Mitigation

The Nelson Marlborough Health Service submission sought that the phraseology of 'frost control' proposed in the notified version be amended to 'frost mitigation'. That is accepted as being appropriate.

2.3.3.7 Existing Activities and Specification of Date

Peter Constantine's submission sought that there be reference to existing activities as at the date that the Plan Change was proposed, i.e. 24 September 2009. He requested that that be specified by deleting the word "existing" from the proposed rules and adding after the word "situated" the following phrase: "*existing at 24 September 2009.*"

We have concluded that there is a difficulty in accepting that submission in that it fixes in time the houses that would be protected. If one takes for example rule 30.2.9.1.1.1 it provides that noise from a frost fan shall not exceed a specified level "*at any point within the notional boundary of any existing dwelling, visitor accommodation or other habitual building (other than on the property on which the frost fan is situated); ....*" If the submission was adopted the word "*existing*" would be removed and the phrase "*existing at 24 September 2009*" instead added at the end after the word "*situated*". The outcome would only be a protection for dwellings, visitor accommodation or other habitual buildings that were existing as at 24 September 2009, which is not the intention.

The intention is to ensure that any frost fan being constructed shall not exceed the stipulated noise level within the notional boundary of any dwelling, visitor accommodation or other habitual building that is existing at the time the new frost fan is operated, i.e. the rule as worded in the notified version enables the flexibility of new houses being constructed which are then to be protected in terms of the noise envelope they are to be subjected to. The Constantine proposal would fix the date for existing dwellings that had to be taken into account. We do not accept this submission for those reasons.

2.3.3.8 Zone Buffer distances and Marlborough Ridge Special Zone

The Marlborough Ridge Zone has special treatment in the Plan distinct from Rural Residential zones, Township Residential zones and Rural Township zones. The best examples of those two latter zones in close proximity to each other is found in the Wairau Valley township.

At that township the Rural Township zone applies in what could be loosely called the small "commercial" centre of the town on the northern side of State Highway 63, with the Township Residential zone existing on the western side of Morse Street to the north of SH63. Three significant Rural Residential zones surround Seniors Road and Cooper Street on the southern side of State Highway 63. As is very apparent from the title sizes shown on planning map number 176 of Volume 3 of the Plan the primary distinction between the differing zones having a residential nature, i.e. the Rural Township zone, the Township Residential zone and the Rural Residential zone is the size of the allotments, with the allotments for the Rural Residential zone being significantly larger.

That is reflected, too, at Rarangi on planning maps 130 and 131 where the Deferred Township Residential zone and Township Residential zone sections are much smaller in size to the north of Rarangi Road as compared to the very substantial sized properties involved in the two Rural Residential zones to the south of Rarangi Road.

The situation is similar for the other major Rural Residential zoned areas located at Benmorven, to the south east and west of Blenheim itself, and at Fairhall immediately to the west of the Marlborough Ridge zone. The section sizes are much larger in those rural residential zones than in the denser purely residential zones, albeit that the south east part of Blenheim in the Battys Road area the rural residential section sizes are not quite as large as they are in the more rural locations.

However, by contrast the Marlborough Ridge Zone sections are predominantly residential size in nature. It seems quite apparent in our view that the type of development that has actually occurred there compared to the type of development that may have been contemplated at the original commencement of Marlborough Ridge, where some larger sections were proposed, may require a revision of those Plan provisions as part of the review process of the Regional and District Plans that is currently underway. The facilities in roading, night time lighting, section sizes, and types of dwellings constructed all indicate to us a denser residential aspect to the Marlborough Ridge Zone development that is not apparent in Rural Residential zones.

We have concluded, therefore, that it is more appropriate for the Marlborough Ridge Zone to receive the benefit of the 500 metre buffer as contrasted to a 300 metre buffer for Rural Residential areas given the differentiation in the nature of development and expectancies. In reaching that conclusion we have taken into account views expressed by the Environment Court in the Maclean case in relation to the expectancies of persons moving into Rural Residential zones that they will enter higher levels of rural noise that they might otherwise expect in residential areas. We do not think the same can be said in the factual sense for the Marlborough Ridge Zone given the manner in which it has developed for the reasons we have just outlined.

In weighing the effect of that decision in the broader "cost" sense to the viticulture industry we do not think that a practical matter on the ground in relation to what exists at the present time in viticulture terms adjacent to the Marlborough Ridge, that that will impose any great "cost" on the industry. We agree with the s.42A report recommendation that it is appropriate on balance as between the varying interests that we have just discussed that there be a consistent treatment of the Marlborough Ridge Zone with the other residential zones rather than with the Rural Residential zones.

2.3.4 Operational Standards

There were a wide range of detailed matters which were the subject of submissions which are very important in achieving what we think should be the aim of this Plan Change in part, and that is the reduction of the number of hours during which frost fans must operate. As stated above on the evidence of the acoustic experts such a reduction in actual operating time would reduce the levels of annoyance and the potential for the interruption of sleep.

That can be achieved without causing undue risk to crops and is in accordance with good practical management of frost risk as was described in the evidence given to us by the capable operators from whom we heard. It is appropriate given the benefits that reduction in hours of use gives rise to, that such rules should be adopted as part of the standards for the operation of the activity to ensure the operating time of the machines is reduced.

Some of those standards exist at the present time or in the present notified form but some others either need inclusion or need amendment as we now address.

2.3.4.1 Four Blades as Against Two

There was submission from submitters seeking a requirement that four bladed frost fan machines be utilised rather than two bladed, as the evidence was that at least one of the four bladed machines has been an improvement on the two bladed variety. The argument was accepted by the acoustic experts that generally speaking a four bladed machine will cover a greater area at a lower speed than a two bladed machine, and that the speed of the tip of the blades is fundamentally important to the noise generated.

However, that is an operational detail that we do not think is necessary to impose as we also had evidence that other two bladed varieties have had improvements carried out, and are subject to ongoing research as to improvements, and we do not think that that should be restricted by requiring across the board four bladed machines.

We did not have sufficient detailed evidence to rule out the possibility that improvements can be achieved in the pitch and design of the two bladed machine to comply with the noise limits, and in fact there was some evidence from the acoustic experts that some versions of the two bladed machines can comply. It is not appropriate, therefore, to inflict the extra cost on the industry, that being the situation. The cost of retrofitting to 4 bladed machines is significant, being likely to be in excess of $20,000 per machine.

2.3.4.2 Commencement of Operation of Frost Fans

There were a range of different temperatures placed before us for commencement of operation. The start point in the proposed notified version of the Plan Change suggested a commencement point of 2°C.

It was plain on the evidence that we heard that some growers are probably even setting their automatic start up point as high as 3°, but the main thrust of the evidence that we heard from the very capable operators who gave evidence before us was a range far lower than that for the automatic start up of the machines of 0.5°C to 0.8°C. Those operators tended to have their own personal alarms to wake them up set at either 2° initially, or no lower than 1°, but with the automatic start up on the actual frost fans themselves at 0.5 to 0.8. The conclusion we have reached is that a start up temperature of 1°C is appropriate. That more than reasonably allows for the time period involved on the evidence before us as a worst case scenario of a drop of temperature of 1° in 20 minutes.

In the body of the submissions there was great emphasis placed on the need for a warm-up of the machines, but it was obvious on the evidence before us that that need is less than 5 minutes in duration, so that does not add any need to have an increased commencement point.

If the commencement level is 1°C as contrasted with what seems a widespread practice at the moment amongst the less careful operators of 2, or possibly even as high as 3°C, then on the basis of the evidence from the capable operators that we did hear, the amount of running time for the machines will be reduced very significantly, and down most probably to a very limited number of hours per season. The "benefit", therefore, from fixing that lower level is very significant. On the evidence we heard from capable operators who are present for frost management purposes on their vineyards in frost risk conditions, the "cost" in terms of increased risk due to frost damage is insignificant at that level.

2.3.4.3 Speed of Frost Fans

In the Maclean case the Environment Court fixed a condition that ensured that the blade tip speed of each fan was not to exceed 340 metres per second at any timeand that was acknowledged by all the acoustic experts as being appropriate. We have accordingly adopted that.

2.3.4.4 Maintenance Testing

The Section 42A report recommended that we accept the submissions made by the viticulture industry of a broader provision for maintenance testing and we agree with that.

It is obviously necessary to ensure that there is provision in the standards for maintenance and testing, and the only issue that arose as between the Section 42A recommendation and the submitters was the suggestion in the Section 42A report that that be limited to week days and exclude weekends and public holidays.

We accept the evidence from the viticulture industry that in rural areas it has to be accepted that maintenance and testing of equipment can and will need to occur in urgent situations on weekends and public holidays - frost waits for no one and certainly not for working days. It is appropriate that maintenance and testing be able to occur in weekends and public holidays if needed, and with that exception we otherwise agree with these submissions and the Section 42A report writer's recommendation.

2.3.4.5 Management Presence during Frost Fan Operation

One of the current complaints of submitters affected by frost fans was that they were facing situations where often there were no personnel present to manage the frost fan operations, and that as a consequence they were either running too long, or in situations where temperatures had risen, or where wind conditions had risen exacerbating the noise of the fans.

Again in the Maclean case the Environment Case had imposed a requirement that in the factual circumstances of that case, where there was a smaller vineyard which involved the vineyard manager, he was to remain on site "*at all times whilst the machines are operating*".

The evidence from the more capable operators from whom we heard was consistent that frost management requires a working presence to be able to react and monitor on an ongoing basis the incidence of frost and risk of it, as well as the desisting of the frost fan operations if conditions changed, i.e. through increased wind or through some other temperature increase.

Again, against the background of the principle that the problem of noise will be reduced the closer the control of the machines, and against the principle that it is plainly appropriate and in accord with good sound viticultural practice that there be such human presence, we think that the Environment Court's requirement is one that was not only appropriate for that particular case before them, but for every situation where frost fans are operating.

It is necessary, therefore, in our view, to have a standard requiring the presence of management or some suitably trained staff during the operation of frost fans on any occasion.

2.3.4.6 Governor for Speed

In respect of some types of frost fan machines there are already in place these types of governors which are installed by the manufacturer and are not able to be changed. A similar requirement was made by way of condition in the Environment Court decision in the Maclean case. Once again we heard evidence from capable operators that not only was that not a problem to accept as a standard, but that it was sound practice, because to exceed the speed as a matter of fact could lead to a reduction in efficiency. We consider it is an appropriate standard to impose at a level that would ensure that the tip of the blade speed could not be exceeded as required by the earlier standard discussed above in that regard.

2.3.4.7 Point of Measurement of Temperature

The Section 42A report recommended that this point for measurement be specified as the "*nominal mid point of the bud height (above ground level) of the plants being protected.*" The reason for that wording being advanced was that these rules must apply to any crop.

However, there is a significant difference between a viticulture crop and other crops. For example, there is an ability in the way in which grape plants are pruned to fix the height at which the lowest crop will be located, and we heard evidence that that can vary from 0.8 metres to 1.5 metres above ground. The level at which that is fixed is managed on vineyards by the height at which the lowest fruiting wire is fixed that supports the lowest fruiting canes on which buds form.

We have decided, therefore, that it is best to differentiate between a viticultural crop and other crops, and specify that the point of measurement of temperature will be at the lowest fruiting wire, which was accepted as appropriate by the viticulture witnesses we heard from. That is distinct from other crops which can utilise the wording suggested in the Section 42A report.

2.3.4.8 Wind Sensors and Automatic Shut Down

It is very clear on the evidence we heard from the viticulture operators that they accept that it is bad practice for a wind machine to operate in excess of 7 or 8 kilometres per hour. The Winegrowers own Code of Practice at the present time specifies 7 kilometres per hour. We heard from at least one very capable operator (Mr. Smith) that levels have been fixed on his own vineyard at 8 kilometres per hour.

We do not detect that there is any significant difference on the acoustic evidence we heard between those two figures and it is reasonable to adopt the 8 kilometres per hour on the evidence.

We do, however, agree with the submissions made by persons affected by the noise that it is important that there be an automatic shut down of frost fan machines when winds exceed that level and it is obviously appropriate in terms of good management practices as well. That will apply regardless of whether the source of wind is advection or katabatic.

2.3.4.9 Manual Switch on Requirement

The submitter Mr Bruckel sought that there be a requirement that frost machines had to be manually switched on.

We do not think that that is either necessary or appropriate given the time involved in getting around a large vineyard to switch on machines when temperatures are rapidly dropping. We consider that the other measures that we have proposed to adopt, particularly requiring a human presence during operation will ensure shut down will meet the situation sought to be achieved by Mr Bruckel. Moreover, ensuring automatic switch on devices are only triggered at any temperature at or below 1°C will also meet the situation appropriately when coupled with the other provisions we have discussed above.

3. Schedule 1 Hearing Schedule

Appearances before the Hearings Committee comprising Commissioner Ron Crosby (Chair) and Councillors Graeme Taylor and Peter Jerram hearing Plan Change 23 MSRMP and Plan Change 58 WARMP

Council Experts

- Section 42A report writers Tony Quickfall (Resource Management Consultant) and Malcolm Hunt (Acoustic Consultant)
- Gina Ferguson (Enforcement Officer)

Submitters and Further Submitters

22 March 2010 (written brief from D.C.Kerr)

- Peter Constantine
- Malcolm MacLean
- Michael Hyson
- Paul Bruckel
- Sara Stringer

23 March 2010

- Waihopai Holdings Limited (Amy Murphy)
- Horticulture New Zealand (Chris Keenan)
- Guy Lissaman
- Nelson Marlborough District Health Board (Dr Ed Kiddle Medical Officer of Health)
- Vern Goodwin (Acoustic Consultant)
- Burtergill Farm (2003) Limited, Dashwood Corner Vineyard Limited and Little Oasis Vineyard Limited (Mr M J Hunt as counsel and Mr G Van Asch)
- Richard Ryan

24 March 2010

- Written evidence from Mr M J Hunt as to costings of replacement parts to retro fit 4 bladed fans
- NZ Wine Growers (Mr D McGregor as Counsel), Mr N Hegley (Acoustic Consultant), P Gregan, S Smith, P McLeod, D Whyte, Mr St Clair (Resource management consultant)
- Final comments also received from the noise expert Mr Malcolm Hunt in the course of this morning, and from Mr Tony Quickfall as Section 42A report writers.

4. Schedule 2 -Schedule of Changes.

File Reference: M135-15-23
Record No: 10148572

MARLBOROUGH
DISTRICT COUNCIL

MARLBOROUGH SOUNDS RESOURCE MANAGEMENT PLAN

Schedule of Changes - Decision Plan Change No. 23: Use of wind machines for frost protection

APPENDIX 1: SCHEDULE OF PROPOSED CHANGES

Where text is proposed to be added to the Wairau/Awatere Resource Management Plan (the Plan) through this plan change, it has been shown in blue. Where existing text is to be deleted it is shown as ~~blue strike through.~~ Where proposed new text has been amended through decisions it is shown as blue underlined. Where the changes are shown as ~~red strike through~~ these are amendments arising from decisions. Where the text is shown in black it is existing text and has been included for information only and does not form part of this plan change.

Marlborough Sounds Resource Management Plan

Volume One

1. Add a new policy 11.3.1.10 to read as follows:

Policy To recognise that, even with a reasonable level of mitigation to avoid significant adverse effects, activities permitted or provided for in rural areas may result in effects arising from the Activity itself or from management practices, including ~~such as~~ noise, dust, smell and traffic generation and other activities located in the Rural Zone need to accept these effects.

Volume Two

Definitions

2. **Add** a new definition as follows:

Frost fan means a land based device, including both permanent and mobile, designed or adapted to mitigate frost damage by fanning warmer air over potentially frost-affected surfaces, and includes any motive source, the support structure and power source.

3. Add the following new definitions to the RM Plans:

$D_{nT,w} + C_{tr}$ means the standardised level difference (outdoor or indoor) and is a measure of the airborne sound insulation provided by the external building envelope (including windows, walls. Ceilings and floors where appropriate) described using $D_{nT,w} + C_{tr}$ as defined in the following standards:

AS/NZS ISO 717.1:2004 Acoustics – rating of sound insulation in buildings and of building elements – Part 1: Airborne sound insulation (using spectrum no.2)

ISO 140-5:1998 Acoustics – Measurement of sound insulation in buildings and of building elements Part 5: Field measurements of airborne sound insulation of façade elements and facades.

Rural 1 and 2 Zones

4. **Delete** Rural 1 and 2 Zones Rule 36.1.3.4.2.3 as follows:

~~36.1.3.4.2.3 Wind Machines for Frost Control~~

~~Any wind machine used for frost control shall be so constructed and operated that any noise emission measured at a distance of 300 metres shall not exceed 60 dBA L10 provided that:~~

~~a) The operation of the wind machine shall be restricted to periods during which the local air temperature does not exceed 2 degrees Celcius;~~

~~b) No wind machine shall be sited within 100 metres of any dwelling not on the same property;~~

~~c) The speed of the wind machine must be governed such that the top speed of the rotor does not exceed the speed of sound; and~~

~~d) The wind machine be located no closer than 500 metres to an Urban Residential Zone.~~

5. **Add** a new Rule 36.1.3.4.2.3 as follows:

36.1.3.4.2.3 Noise Sensitive Activities

a) Any new dwellinghouse, visitor accommodation or other habitable building located within 300 metres of any frost fan shall be designed and constructed so that within the external building envelope surrounding any bedroom (when the windows are closed) airborne sound insulation meets the following standards, as determined in accordance with NZS 1276.1:1999 (Acoustics-Rating of sound insulation in buildings and of building elements Part 1):

Dwellings located less than 300m and more than 200m from the nearest frost fan $D_{nT,w} + C_{tr} > 25$

Dwellings located less than 200m and more than 100m from the nearest frost fan $D_{nT,w} + C_{tr} > 30$

Dwellings located less than 100m from the nearest frost fan $D_{nT,w} + C_{tr} > 35$

.

b) For the purposes of this rule, "external building envelope" means an envelope defined by the outermost physical parts of the building, normally the cladding and roof.

Compliance with this standard shall be demonstrated by the production of a design certificate from an appropriately qualified and experienced acoustic engineer. The design certificate shall be based either on actual noise measurements with the closest frost fan operating at normal duty, or an assumed noise level based on a frost fan emitting a noise level calculated using 500 metre reference sound level data as follows: Note: this is based on protection from the dominant noise source that being the closest frost fan.

	Octave Centre Frequency (Hz)							
	63	125	250	500	1k	2k	4k	dBA
Design sound pressure level for one frost fan at 500 metres	64	61	49	44	45	38	27	50

c) 36.1.3.4.2.3 (a) and (b) of this rule shall also apply to any alteration of an existing dwellinghouse, visitor accommodation or other habitable building located within 300 metres of any frost fan, where a new bedroom forms part of the alteration. Only the new bedroom has to be treated in accordance with 36.1.3.4.2.3 (a) and (b) of this rule.

d) For the purpose of this rule, "frost fan" includes any lawfully established frost fan, and includes a proposed frost fan for which an approved building consent and/or resource consent has been granted.

6. **Add** a new bullet point to the list of bullet points in Rural 1 and 2 Zones Rule 36.2 as follows:

- Erection and use of frost fans

7. **Add** a new Rule 36.2.7 as follows:

36.2.7 Erection and use of frost fans

The construction use and maintenance of a frost fan is a Controlled Activity provided that the activity conforms to the following standards and terms:

36.2.7.1 Standards and Terms

36.2.7.1.1 Noise from a frost fan shall not exceed 55 dBA Leq (15 Min):

a) at a distance of 300 metres from the device; or

b) at any point within the notional boundary of any existing dwelling, visitor accommodation or other habitable building (other than on the property on which the frost fan is situated);

whichever is the least distance.

36.2.7.1.2 Sound levels shall be measured in accordance with the provisions of NZS 6801: 2008 Acoustics – Measurement of Environmental Sound and assessed in accordance with the provisions of NZS 6802: 2008 Acoustics – Environmental Noise. For the avoidance of doubt, NZS 6801:1991 and NZS 6802: 1991 do not apply.

36.2.7.1.3 The frost fan shall only be operated for protection of crops from frost from bud burst to harvest: .

36.2.7.1.4 A frost fan shall only be operated in wind speeds not exceeding 8 km/hr and with start up not occurring until the local air temperature drops to 1°C or below, and shut down when the local temperature reaches 2°C. For the purposes of this rule, temperature shall be measured within the property to be protected, for vineyards at the lowest fruiting wire and for other crops at the lowest point of the bud height (above ground level) of the plants being protected.

With the exception that frost fans may be operated above 1°C for the purposes of maintenance and testing, limited to operation between 8am to 5pm on any day.

36.2.7.1.5 The blade tip speed shall not exceed 340 metres per second.

36.2.7.1.6 The vineyard manager or a person appropriately trained to manage frost risk by the use of frost fans shall always be present on any vineyard whilst a frost fan is operating on that vineyard.

36.2.7.1.7 The frost fan shall not be located within 500 metres of an Urban Residential, Township Residential, Rural Township Zone or within 300 metres of a Rural Residential Zone.

36.2.7.1.5 An application shall include the following information:

a) Details of the proposed frost fan(s), including make and model, manufacturers specifications, blade type and configuration, drive motor details, and design speed of the tips of the blades.

b) A plan showing the location of the proposed frost fan(s) and area it is designed to cover, and the location of any other existing or consented (but not installed) frost fans within a 300m radius.

c) A plan showing the location of the nearest dwelling, visitor accommodation or habitable building, or the nearest zone of a residential nature, and the distance to it.

d) A report prepared by an appropriately qualified and experienced acoustic consultant addressing the following:

- a full and detailed description of the proposed equipment;
- prediction of the noise contours of the proposed frost fan based on operational parameters specifically identified in the report for the particular location where the frost fan is proposed to operate;
- an assessment of the Standards and Terms in 36.2.7.1.
- detail of all means to ensure the performance of the frost fan and noise levels remain as predicted. Including measures to govern the blade tip speed and the cut-off mechanism for winds exceeding 8 km per hour.

36.2.7.2 Matters Over Which the Council Will Exercise Control

The Council reserves control over and may impose conditions with respect to:

a) Operational requirements of any frost fans.

b) Orientation, rotational constraints, speed of any frost fan power source or frost fan blade set and engine muffling.

c) Operation of any frost fan for maintenance purposes.

d) Recording information about the use of any frost fan.

e) Monitoring and reporting.

f) The application of a requirement to apply best practicable options for reduction of noise if need by review of condition.

g) The review of Conditions.

File Reference: W045-15-58
Record No: 10148568

MARLBOROUGH
DISTRICT COUNCIL

WAIRAU/AWATERE RESOURCE MANAGEMENT PLAN

Schedule of Changes - Decision Plan Change No. 58: Use of wind machines for frost protection

APPENDIX 1: SCHEDULE OF PROPOSED CHANGES

Where text is proposed to be added to the Wairau/Awatere Resource Management Plan (the Plan) through this plan change, it has been shown in blue. Where existing text is to be deleted it is shown as ~~blue strike through.~~ Where proposed new text has been amended through decisions it is shown as blue underlined. Where the changes are shown as ~~red strike through~~ these are amendments arising from decisions. Where the text is shown in black it is existing text and has been included for information only and does not form part of this plan change.

Wairau/Awatere Resource Management Plan

Volume One

1. Amend policy 12.2.2, 2.1 to read as follows:

Policy 2.1	To recognise that, even with a reasonable level of mitigation to avoid significant adverse effects, activities permitted or provided for in rural areas may result in effects arising from the activity itself or from management practices, including ~~such as~~ noise, dust, smell and traffic generation ~~but that these will require mitigation where they have a significant adverse effect on the rural environment~~ and other activities located in the Rural Zone need to accept these effects.

Volume Two

Definitions

2. **Add** a new definition as follows:

Frost fan	means a land based device, including both permanent and mobile, designed or adapted to ~~control frost~~ mitigate frost damage by fanning warmer air over potentially frost-affected surfaces, and includes ~~the~~ any motive source, the support structure, and power source.

3. Add a new definition as follows:

$D_{nT,w} + C_{tr}$	means the standardised level difference (outdoor or indoor) and is a measure of the airborne sound insulation provided by the external building envelope (including windows, walls. Ceilings and floors where appropriate) described using $D_{nT,w} + C_{tr}$ as defined in the following standards: AS/NZS ISO 717.1:2004 Acoustics – rating of sound insulation in buildings and of building elements – Part 1: Airborne sound insulation (using spectrum no.2) ISO 140-5:1998 Acoustics – Measurement of sound insulation in buildings and of building elements Part 5: Field measurements of airborne sound insulation of façade elements and facades.

Rural 3 and 4 Zones

4. **Delete** Rural 3 and 4 Zones Rule 30.1.4.2.3 as follows~~. (Consequential renumbering for existing Rule 30.1.4.2.4 Temporary Military training Activities to 30.1.4.2.3)~~

~~**30.1.4.2.3 Wind machines for Frost Control**~~

~~Any wind machine used for frost control shall be so constructed and operated that any noise emission measured at a distance of 300 metres shall not exceed 60 dBA L10 provided that:~~

~~a) The wind machine will be allowed to operate during the frost danger period until the leaves of the plant are dry and the air temperature has reached 2°C;~~

~~b) The speed of the wind machine must be governed such that the top speed of the rotor does not exceed the speed of sound; and~~

~~c) The wind machine be located no closer than 500 metres to any residential zone, or within 100 metres of a dwelling house not located on the property.~~

5. **Add** a new rule 30.1.4.2.34 as follows:

30.1.4.2.34 Noise Sensitive Activities

a) Any new dwellinghouse, visitor accommodation or other habitable building located within 300 metres of any frost fan shall be designed and constructed so that within the external building envelope surrounding any bedroom (when the windows are closed) airborne sound insulation meets the following standards, as determined in accordance with NZS 1276.1:1999 (Acoustics-Rating of sound insulation in buildings and of building elements Part 1):

Dwellings located less than 300m and more than 200m from the nearest frost fan	$D_{nT,w} + C_{tr} > 25$
Dwellings located less than 200m and more than 100m from the nearest frost fan	$D_{nT,w} + C_{tr} > 30$
Dwellings located less than 100m from the nearest frost fan	$D_{nT,w} + C_{tr} > 35$

~~to ensure that the noise level inside any bedroom of the dwelling shall not exceed 30 dB LAeq with the closest frost fan operating when the doors and windows are closed. Compliance with this standard shall be demonstrated by the production of a design certificate from an appropriately qualified and experienced acoustic engineer.~~

b) For the purposes of this rule, "external building envelope" means an envelope defined by the outermost physical parts of the building, normally the cladding and roof.

Compliance with this standard shall be demonstrated by the production of a design certificate from an appropriately qualified and experienced acoustic engineer. The design certificate shall be based either on actual noise measurements with the closest frost fan operating at normal duty, or an assumed noise level based on a frost fan emitting a noise level calculated using 500 metre reference sound level data as follows: Note: this is based on protection from the dominant noise source that being the closest frost fan.

	Octave Centre Frequency (Hz)							
	63	125	250	500	1k	2k	4k	dBA
Design sound pressure level for one frost fan at 500 metres	64	61	49	44	45	38	27	50

~~(b)~~c) ~~This~~ 30.1.4.2.3 (a) and (b) of this rule shall also apply to any alteration of an existing dwellinghouse, visitor accommodation or other habitable building located within 300 metres of any frost fan, where a new bedroom forms part of the alteration. Only the new bedroom has to be treated in accordance with ~~part~~ 30.1.4.2.3 (a) and (b) of this rule.

~~(c~~d)) For the purpose of this rule, "frost fan" includes any lawfully established frost fan, and includes a proposed frost fan for which an approved building consent and/or resource consent has been granted.

6. **Add** a new bullet point to the list of bullet points in Rural 3 and 4 Zones Rule 30.2.1 as follows:

- Erection and use of frost fans

7. **Add** a new Rule 30.2.9 as follows:

30.2.9 Erection and use of frost fans

The construction ~~and~~ use and maintenance of a frost fan is a Controlled Activity provided that the activity conforms to the following standards and terms:

30.2.9.1 Standards and Terms

30.2.9.1.1 Noise from a frost fan shall not exceed 55 dB LAeq (15min) ~~when measured~~:

~~i~~a) at a distance of 300 metres from the device; or

~~ii~~b) at any point within the notional boundary of any existing dwelling, visitor accommodation or other habitable building (other than on the property on which the frost fan is situated);

whichever is the least distance.

30.2.9.1.2 Sound levels shall be measured in accordance with the provisions of NZS 6801: 2008 Acoustics – Measurement of Environmental Sound and assessed in accordance with the provisions of NZS 6802: 2008 Acoustics – Environmental Noise. For the avoidance of doubt, NZS 6801:1991 and NZS 6802: 1991 do not apply.

30.2.9.1.3 The frost fan shall only be operated for ~~frost~~ protection of crops from frost from bud burst to harvest: ~~and when the air temperature on the vineyard drops to 2°C.~~

30.2.9.1.4 ~~With the exception under (i) below, the~~ A frost fan shall only be operated in wind speeds not exceeding 8 km/hr and with start up not occurring until the local air temperature drops to 1°C or below, and shut down when the local temperature reaches 2°C. For the purposes of this rule, temperature shall be measured within the property to be protected, for vineyards at the lowest fruiting wire and for other crops at the lowest point of the bud height (above ground level) of the plants being protected.

With the exception that frost fans may be operated above 1°C for the purposes of maintenance and testing, limited to operation between 8am to 5pm on any day.

30.2.9.1.5 The blade tip speed shall not exceed 340 metres per second.

30.2.9.1.6 The vineyard manager or a person appropriately trained to manage frost risk by the use of frost fans shall always be present on any vineyard whilst a frost fan is operating on that vineyard.

30.2.9.1.74 The frost fan shall not be located within 500 metres of an Urban Residential, Township Residential, Rural ~~Residential~~ Township, ~~Zone or~~ the Marlborough Ridge Zone or within 300 metres of a Rural Residential Zone.

30.2.9.1.8~~1~~ An application shall include the following information:

a) Details of the proposed frost fan(s), including make and model, manufacturers specifications, blade type and configuration, drive motor details, and design speed of the tips of the blades.

b) A plan showing the location of the proposed frost fan(s) and area it is designed to cover, and the location of any other existing or consented (but not installed) frost fans within a 300m radius.

c) A plan showing the location of the nearest dwelling, visitor accommodation or habitable building, or the nearest zone of a residential nature, and the distance to it.

d) A report prepared by an appropriately qualified and experienced acoustic consultant addressing the following:

- a full and detailed description of the proposed equipment;
- prediction of the noise contours of the proposed frost fan based on operational parameters specifically identified in the report for the particular location where the frost fan is proposed to operate;
- an assessment of the Standards and Terms in 30.2.9.1; and
- detail of all means to ensure the performance of the frost fan and noise levels remain as predicted, including measures to govern the blade tip speed and the cut-off mechanism for winds exceeding 8 km per hour.

30.2.9.2 Matters Over Which the Council Will Exercise Control

The Council reserves control over and may impose conditions with respect to:

a) Operational requirements of any frost fans.

b) Orientation, rotational constraints, ~~S~~speed of any frost fan power source or frost fan blade set and engine muffling.

c) Operation of any frost fan~~s~~ for maintenance purposes.

d) Recording information about the use of any frost fan~~s~~.

e) Monitoring ~~requirements~~and reporting.

f) The application of a requirement to apply best practicable options for reduction of noise if need by review of condition (a)

g) The review of Conditions.

Rural Residential Zone

8. **Add** a new rule 31.1.5.1 as follows:

31.1.5.1 Noise Sensitive Activities

a) Any new dwellinghouse, visitor accommodation or other habitable building located within 300 metres of any frost fan shall be designed and constructed so that within the external building envelope surrounding any bedroom (when the windows are closed) airborne sound insulation meets the following standards, as determined in accordance with NZS 1276.1:1999 (Acoustics-Rating of sound insulation in buildings and of building elements Part 1):

Dwellings located less than 300m and more than 200m from the nearest frost fan	$D_{nT,w} + C_{tr} > 25$
Dwellings located less than 200m and more than 100m from the nearest frost fan	$D_{nT,w} + C_{tr} > 30$
Dwellings located less than 100m from the nearest frost fan	$D_{nT,w} + C_{tr} > 35$

~~to ensure that the noise level inside any bedroom of the dwelling shall not exceed 30 dB LAeq with the closest frost fan operating when the doors and windows are closed. Compliance with this standard shall be demonstrated by the production of a design certificate from an appropriately qualified and experienced acoustic engineer.~~

b) For the purposes of this rule, "external building envelope" means an envelope defined by the outermost physical parts of the building, normally the cladding and roof.

Compliance with this standard shall be demonstrated by the production of a design certificate from an appropriately qualified and experienced acoustic engineer. The design certificate shall be based either on actual noise measurements with the closest frost fan operating at normal duty, or an assumed noise level based on a frost fan emitting a noise level calculated using 500 metre reference sound level data as follows: Note: this is based on protection from the dominant noise source that being the closest frost fan.

	Octave Centre Frequency (Hz)							
	63	125	250	500	1k	2k	4k	dBA
Design sound pressure level for one frost fan at 500 metres	64	61	49	44	45	38	27	50

c~~b~~) 31.1.5.1. (a) and (b) of this rule shall also apply to any alteration of an existing dwellinghouse, visitor accommodation or other habitable building located within 300 metres of any frost fan, where a new bedroom forms part of the alteration. Only the new bedroom has to be treated in accordance with ~~part~~ 31.1.5.1 (a) and (b) of this rule.

d~~c~~) For the purpose of this rule, "frost fan" includes any lawfully established frost fan, and includes a proposed frost fan for which an approved building consent and/or resource consent has been granted.

Appendix K Marlborough Ridge Zone

9. **Add** a new rule 2.2.11.1 (to be located immediately before the 'Bird Scaring Device' rule) as follows:

2.2.11.1 Noise Sensitive Activities

a) Any new dwellinghouse, visitor accommodation or other habitable building located within 300 metres of any frost fan shall be designed and constructed so that within the external building envelope surrounding any bedroom (when the windows are closed) airborne sound insulation meets the following standards, as determined in accordance with NZS 1276.1:1999 (Acoustics-Rating of sound insulation in buildings and of building elements Part 1):

Dwellings located less than 300m and more than 200m from the nearest frost fan	$D_{nT,w} + C_{tr} > 25$
Dwellings located less than 200m and more than 100m from the nearest frost fan	$D_{Nt,w} + C_{tr} > 30$
Dwellings located less than 100m from the nearest frost fan	$D_{Nt,w} + C_{tr} > 35$

~~to ensure that the noise level inside any bedroom of the dwelling shall not exceed 30 Db Laeq with the closest frost fan operating when the doors and windows are closed. Compliance with this standard shall be demonstrated by the production of a design certificate from an appropriately qualified and experienced acoustic engineer~~

b) For the purposes of this rule, "external building envelope" means an envelope defined by the outermost physical parts of the building, normally the cladding and roof.

Compliance with this standard shall be demonstrated by the production of a design certificate from an appropriately qualified and experienced acoustic engineer. The design certificate shall be based either on actual noise measurements with the closest frost fan operating at normal duty, or an assumed noise level based on a frost fan emitting a noise level calculated using 500 metre reference sound level data as follows: Note: this is based on protection from the dominant noise source that being the closest frost fan.

	Octave Centre Frequency (Hz)							
	63	125	250	500	1k	2k	4k	dBA
Design sound pressure level for one frost fan at 500 metres	64	61	49	44	45	38	27	50

c~~(b)~~ 2.2.11.1 (a) and (b) of t~~T~~his rule shall also apply to any alteration of an existing dwellinghouse, visitor accommodation or other habitable building located within 300 metres of any frost fan, where a new bedroom forms part of the alteration. Only the new bedroom has to be treated in accordance with ~~part~~ 2.2.11.1 (a) and (b) of this rule.

(c) For the purpose of this rule, "frost fan" includes includes any lawfully established frost fan, and includes a proposed frost fan for which an approved building consent and/or resource consent has been granted.

10. **Number** the 'Bird Scaring Device' rule as 2.2.11.2.

11. **Delete** the 'Wind Machines for Frost Control' under 2.2.11 as follows:

~~**Wind Machines for Frost Control**~~

- ~~Noise levels measured at 200 metres from the wind machine shall not exceed 60 dBA provided that:~~
- ~~That the start-up air temperature for the machine should be no higher than 2°C.~~
- ~~That the wind machine be allowed to operate during the frost danger period until the leaves of the plant are dry and the air temperature has reached 1°C.~~
- ~~That the speed of the wind machine must be governed such that the top speed of the rotor does not exceed the speed of sound.~~
- ~~That the wind machine be located no closer than 500 metres to a residential zone.~~

~~**10. Add** a new rule 2.3.3 as follows:~~

~~2.3.3 Erection and use of frost fans~~

~~The construction and use of a frost fan is a Controlled Activity provided that the activity conforms to the following standards and terms:~~

~~2.3.3.1 Standards and Terms~~

~~2.3.3.2 Noise from a frost fan shall not exceed 55 dB LAeq when measured:~~

~~i) At a distance of 300 metres from the device; or~~

~~ii) At the notional boundary of any existing dwelling, visitor accommodation or other habitable building (other than on the property on which the frost fan is situated);~~

~~whichever is the least distance.~~

~~2.3.3.3 Sound levels shall be measured in accordance with the provisions of NZS 6801: 2008 Acoustics – Measurement of Sound and assessed in accordance with the provisions of NZS 6802: 2008 Acoustics – Environmental Noise.~~

~~2.3.3.4 The frost fan shall only be operated for frost protection and when the air temperature on the vineyard drops to 2°C.~~

~~2.3.3.5 Matters Over Which the Council Will Exercise Control~~

~~The Council reserves control over and may impose conditions with respect to:~~

~~(a) Operational requirements of frost fans.~~

~~(b) Speed of frost fan.~~

~~(c) Operation of frost fans for maintenance purposes.~~

~~(d) Recording information about the use of frost fans.~~

~~(e) Monitoring requirements.~~