

IN THE VICTORIAN CIVIL AND ADMINISTRATIVE APPEALS TRIBUNAL
Planning and Environment List

No 2910 of 2012

BETWEEN

CHERRY TREE WIND FARM PTY LTD

Applicant

and

MITCHELL SHIRE COUNCIL

First Respondent

and

TRAWOOL VALLEY-WHITEHEADS CREEK LANDSCAPE GUARDIANS

INC

Second Respondent

and

ORS

Respondents

SUBMISSIONS

Provided on behalf of the Second Respondent by:

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SUBMISSIONS

1. These submissions are made on behalf of the Trawool Valley-Whiteheads Creek Landscape Guardians Inc (“the Guardians”), objectors to the application for a planning permit. A list of the members of the Guardians has been provided.

Suggestion for the deferral of the final decision

2. On Wednesday, 6 March 2013 the Tribunal delivered detailed observations and remarks concerning the association between wind farms and the symptoms described in evidence before the Tribunal of sleep disturbance, increased anxiety, headaches, etc. The Tribunal has asked, that if it is otherwise satisfied that the proposal is consistent with planning policy, whether it should defer a final decision until studies by the EPA South Australia at Waterloo into the impact of turbine noise on sleep and health are completed or a further report from the NHMRC becomes available concerning that issue.
3. The Guardians’ primary submission is that when the scope of what is required to be considered under the rubric of “human wellbeing” is properly understood, there is no need to defer a decision as there is ample evidence that there will be more than minimal impact on the human wellbeing and amenity of the community comprising the Trawool Valley and Whiteheads Creek.
4. Section 5.1 and 5.1.1 of the “*Policy and Planning Guidelines for Development of Wind Energy Facilities in Victoria* (July 2012) (“the policy”) requires the responsible authority “*to balance environmental, social and economic matters in favour of net community benefit and sustainable development*”; and that the responsible authority “*must assess the impact of a wind energy facility on ... human wellbeing and amenity in a systematic manner*.”

5. The concept of human “wellbeing” is not limited to an absence of infirmity or disease or deleterious health effects: the concept of human “wellbeing” is far broader than that. The term is not defined in the policy. However, a substantially similar question arose for consideration in the matter of *Romsey Hotel Pty Ltd v Victorian Commission for Gambling Regulation & Anor*¹ (“Romsey”).
6. In *Romsey* the Tribunal was called upon to interpret and apply s3.3.7(1)(c) of the *Gambling Regulation Act*. That provision is concerned with the “net economic and social impact” of approving gaming machines and provides a requirement that such an “approval will not be detrimental to the well-being of the community of the municipal district in which the premises are located”.²
7. In *Romsey*, the President, Justice Bell provided a detailed analysis of the Victorian legislation which promotes “public health and well-being” and which is relevant to planning considerations.³
8. A detailed analysis then followed of the concept of community “wellbeing”.⁴ The President, having referenced authority and the World Health Organisation’s definition of health, held that “*The state of wellbeing has social, cultural, economic and environmental elements. It is an holistic concept.*”⁵ The President also held that “*Community wellbeing is an evidence-based concept*”.⁶ As to which the President stated:⁷

The views of people in a community (however subjective) can provide valuable insight into the lived experience of their individual and collective

¹ [2009] VCAT 2275.

² Ibid at [229].

³ Ibid at [300]-[319].

⁴ Ibid at [353]-[365].

⁵ Ibid at [360].

⁶ Ibid at [364].

⁷ Ibid at [361]-[362].

wellbeing and how the social character of a community may be affected by a significant change.

Since capacity is important for wellbeing, and participation builds capacity, an aspect of wellbeing is democratic participation by people at the local level in decision-making about issues affecting them.

9. There are 2 important observations to be made relevant to the passages above. First, is that the Guardians' 8 local witnesses , and some 17 lay objectors have given evidence or made submissions on how this proposal will impact (negatively) on the collective well-being of this community and on how the social character of this community will be (negatively) affected by this proposal.
10. Secondly, the Guardians' witnesses and the lay objectors gave evidence or made submissions on the fact that the responsible authority had received 117 objections from the local community, as against a mere 5 submissions in favour, and that, subsequently, it would have made a unanimous decision refusing the application (had it had the opportunity to do so). The degree and strength of local opposition to this proposal, and the response of the responsible authority to that opposition, is evidence of democratic participation of the kind referred to in the passage from *Romsey* above; so too is the support given to the Guardians and other objectors throughout this hearing. All of which is an important aspect of well-being.
11. The Tribunal has heard from one gentleman in favour of this proposal, Mr Tomkins. However, Mr Tomkins resides well outside of this community and is not faced with any impact personal to him. His submission has no bearing on or relevance to the question of human well-being as it relates to this community.
12. The guardians and the lay objectors have provided evidence or submissions which are, according to *Romsey*, directly relevant to the assessment of the impact of this proposal on human well-being and amenity. That evidence demonstrates that the

negative impact on human well-being and amenity here will not be a “minimal impact”.

13. Under clause 52.32, for a wind energy facility to be considered as being established in an “appropriate location” it can have no more than a “minimal impact on the amenity of the area”, where the term “amenity” must necessarily include the impact on human well-being.
14. The evidence before the Tribunal is sufficient to establish that this particular proposal will have a significant if not substantial negative impact on human well-being: including negative impacts on the social, cultural, economic and environmental elements embodied in that concept.
15. The focus given to this question by the Guardians, the lay objectors (with support from the Waubra Foundation and the evidence of Dr Laurie) is to be contrasted with the evidence led by the applicant. Not one of the expert witnesses called by the applicant even considered sections 5.1 and 5.1.1 of the policy; none of their opinion evidence specifically addressed those provisions. The applicant simply elected to ignore altogether those provisions in its evidence.
16. That a sophisticated corporate entity applying for a planning permit, competently represented, and with a team of professional expert witnesses failed to address what the policy describes as “key criteria for evaluation of the planning merits of a wind energy facility” is worthy of comment. It is not, however, a sufficient reason to defer a decision on the merits of the application as a whole.
17. On one view, the suggestion made by the Tribunal that the applicant involve itself in a properly conducted survey at 2 or 3 operating wind farms, so as to identify the incidence of health related complaints, is an invitation to the applicant to “fix up

its case” with evidence on a topic (ie human well-being) that it deliberately chose to ignore or avoid.

18. The applicant engaged a professional planner, Ms Butcher who gave written and oral evidence and who should have been well familiar with sections 5.1 and 5.1.1 of the policy and of the need for the applicant to address those provisions.
19. The Tribunal has evidence of the impact on human well-being from the Guardians, lay objectors and Waubra Foundation. On the evidence presented concerning the impact on human well-being and amenity, it is submitted that, this proposal is inconsistent with clause 52.32 and should be refused on that basis without any further need to defer a decision to allow the applicant to prove that there is no causal link; or if there is, that the health impacts will concern an insignificant number of people in this community.
20. As the President in Romsey held, citing the Court of Appeal in *Macedon Ranges Shire Council v Romsey Hotel Pty Ltd*⁸ in respect of the concept of community well-being:⁹

Adopting the ordinary dictionary meaning of the word, it held ‘well-being is to be measured (at least) by the extent to which the community is healthy, happy, contented and/or prosperous.’ Therefore, approvals likely to cause unhappiness or discontent in the community (or any part or parts of it) will cause a social impact which is detrimental to its wellbeing. (emphasis added)

21. Here there is ample evidence that this proposal will cause unhappiness and discontent in this community. Indeed, there is evidence that the application itself has done that already. As such, there is evidence that this proposal will cause social impacts detrimental to human well-being in this case.

⁸ (2008) 19 VR 422.

⁹ Romsey at [354].

22. To defer this decision to await further and better evidence of the causal link between wind turbine noise and adverse physical health effects is too limited, with respect. As submitted above, the concept of human well-being is far broader than physical health and includes psychological health; as well as social, cultural, economic and environmental elements.¹⁰
23. If the Tribunal were minded to defer a decision that deferral should be on the basis that the proponent not only prove that there are no adverse physical health effects (or that if there are such effects then the incidence is likely to be insignificant) but also that the impact on human well-being (ie the broader concept as set out in *Romsey*) in this particular instance will be no more than a minimal impact.
24. It is also submitted that there is a significant difference between what is proposed by the EPA of South Australia in its research project at Waterloo, which will have the support of the University of Adelaide, and the report expected from the NHMRC later this year.
25. The Waterloo study will be the first time that field based research into the acoustic impacts on sleep and health is conducted with the guaranteed cooperation of the windfarm's operator, which will be required by the EPA to turn its turbines on and off upon request and to also provide the wind speed and operational data critical to understand the acoustic data gathered at and inside adjacent homes.
26. On the other hand, it is important to note that the NHMRC does not carry out any research in its own right and that any further report that it produces will be based on literature which was presented to it prior to the cut-off date for its latest review,

¹⁰ Ibid at [360].

which the Guardians understand was 28 September 2012.¹¹ It will obviously not take into account the work done by the SA EPA and University of Adelaide at Waterloo. Much of the literature which the NHMRC will consider is already before the Tribunal - refer the annexures to Dr Laurie's statement; the papers and journal articles in exhibit LG 76 and the annexures to the statement of Dr Adam McCarthy. There is a substantial difference between the literature review to be carried out by the NHMRC and the field research to be carried out by the SA EPA and University of Adelaide.

27. In the event that the Tribunal is minded to defer a decision on the impact on human well-being and amenity, the Guardians would seek an opportunity to be heard on any further material placed before the Tribunal, as well as having input in the process of how such material is gathered and presented.
28. The submissions that follow below are made in support of the Guardians' primary submission that the application should be refused on the basis of the evidence currently before the Tribunal.

The policy: addressed by the Guardians, ignored by the applicant

29. The policy is a reference document as is New Zealand Standard NZS 6808–2010. Both of these documents require consideration. However, the concept of human well-being (as identified in *Romsey*) goes well beyond the numerical estimation or measurement of audible noise and certainly goes beyond noise predictions in terms of dB(A) levels which are inappropriate to windfarm noise: Mr Cooper

¹¹ According to an email from the NHMRC: "The deadline for stakeholder submissions of literature for consideration in the systematic review was 28 September 2012. While we are continuing to keep a watching brief in this space, we are no longer able to accept any further submissions for formal consideration in the review, as the Reviewer has completed the process of collating and assessing literature for eligibility. In order to ensure that the systematic review is completely in a timely manner, the Reviewer now needs to be given adequate time to complete the synthesis and analysis of the available evidence that has met the criteria for inclusion in the review."

described the A-weighting as “useless” for that purpose. The same observation was made by Dr Paul Schomer in the Shirley Wisconsin report:¹²

Currently the wind turbine industry presents only A-weighted octave band data down to 31 Hz. They have stated that the wind turbines do not produce low frequency sound energies. The measurements at Shirley have clearly shown that low frequency infrasound is clearly present and relevant. A-weighting is totally inadequate and inappropriate for description of this infrasound.

30. None of the applicant’s witnesses considered, let alone addressed, sections 5.1 or 5.1.1 of the policy which, it is submitted, is fatal to this application. The applicant has not provided any evidence referenced to the key requirements of the policy. Evidence from the bar table is not sufficient (see below). Nor is reference to panel decisions sufficient to overcome the applicant’s omission. The decisions referred to predate the policy and, therefore, simply do not consider these provisions as they were not then in existence. It is submitted that the Tribunal gains no assistance from the panel decisions and the applicant can gain no comfort from them. The policy, having identified that “*This section outlines the key criteria for evaluation of the planning merits of a wind energy facility*” at 5.1 provides:

Proposals for wind energy facilities must be assessed against state planning policy, local planning policy and other matters specified in section 60 of the Planning and Environment Act 1987.

These guidelines provide responsible authorities with assistance for the assessment of a wind energy facility. The extent and breadth of issues that arise and require assessment will differ between proposals and will need to be determined on a case-by-case basis. Responsible authorities should endeavour to balance environmental, social and economic matters in favour of net community benefit and sustainable development.

An explanation of matters to be considered by responsible authorities in assessing permit applications for wind energy facilities follows. Some suggested impact reduction measures specific to wind energy facilities are outlined below.

¹² Waubra Foundation book, tab 23, page 3-4.

31. Among the matters referred to in section 60 of the *Planning and Environment Act* 1997 is that provided in ss(1A)(a): “*Before deciding on an application, the responsible authority, if the circumstances appear to so require, may consider - any significant social and economic effects of the use or development for which the application is made*”.
32. While that provision is discretionary, the *Planning and Environment Act* draws focus to the social and economic effects of the development generally, supporting that specified in section 5.1 of the policy. The policy continues in 5.1.1 which provides:

The State Planning Policy Framework (SPPF) in all planning schemes requires that planning authorities make decisions on the basis of fair, orderly, economic and sustainable use and development of land. In this context the SPPF contains a specific policy position regarding renewable energy – refer to Clause 19.01 (Renewable energy). This is the overarching policy statement regarding wind energy development which states:

Objective

To promote the provision of renewable energy in a manner that ensures appropriate siting and design considerations are met.

Strategies

In considering proposals for renewable energy, consideration should be given to the economic and environmental benefits to the broader community of renewable energy generation, while also considering the need to minimise the effects of a proposal on the local community and environment. (Paragraph 4 of 5)

More specific provisions relating to assessing wind energy developments are set out in Clause 52.32 (Wind Energy Facility) of the VPP.

Responsible authorities must assess the impact of a wind energy facility on landscape values, flora and fauna, human wellbeing and amenity in a systematic manner. In assessing impacts and appropriate mitigation responses, responsible authorities should reference best practice standards including the draft National Wind Farm Development Guidelines (July 2010) and Best Practice Guidelines for Implementation of Wind Energy Projects in Australia (Auswind, December 2006).

33. The policy continues with sections:

- 33.1 5.1.2 Amenity of the surrounding area;
- 33.2 5.1.3 Landscape and visual amenity;
- 33.3 5.1.4 Flora and fauna;
- 33.4 5.1.5 Aircraft safety;
- 33.5 5.1.6 Construction impacts on decommissioning

34. None of these sections provide any guidance in respect of assessing the impact of wind energy facility on “human well-being”; or any definition of that term. Section 5.1.1 suggests reference should be had to best practice standards including the draft National Wind Farm Development Guidelines (July 2010) and Best Practice Guidelines for Implementation of Wind Energy Projects in Australia (Auswind, December 2006). The former document in section 1.5 has this to say (see RA91):

These Guidelines do discuss issues such as amenity and annoyance which, if not properly addressed, could have health impacts. If evidence of direct health impacts does come to light, these Guidelines would be modified as required.

35. The draft National Wind Farm Development Guidelines goes on to consider, in section 3.2, noise and its potential to impact on wellbeing:

Noise emissions from a wind farm development therefore need to be assessed and managed to ensure that sleep is not disturbed, and to avoid unreasonable impacts on wellbeing and unreasonable interference with normal domestic activities.

36. The Best Practice Guidelines for Implementation of Wind Energy Projects in Australia has this to say on social and health impacts:¹³

¹³ At page 39.

An impact assessment will be required to identify all relevant environmental, social, health and economic effects associated with the proposal. It should be noted that during the course of detailed evaluation of these issues, it may be necessary for the proponent to amend the proposed wind project design.

37. It is submitted that neither of these documents provide complete guidance for responsible authorities to assess the impact of wind energy facility on human well-being and amenity. It is, therefore, useful to commence the consideration of the impact on human well-being having regard to the broad concept identified in *Romsey* (see above at paragraphs 5 to 8 and 20).
38. The Guardians submit that this proposal will have significant adverse amenity impacts on the area and a significant impact on human wellbeing in this community, as defined in *Romsey*.

This proposal is inconsistent with the planning scheme

39. The Guardians submit that the application is inconsistent with the objectives of the Mitchell Shire Council Planning Scheme (“the planning scheme”) and, accordingly, must be refused on the basis that it is inappropriately sited given the evidence of adverse impacts on human wellbeing and amenity.
40. As identified in *Romsey* well-being “is an holistic concept”; and “The state of well-being has social, cultural, economic and environmental elements”.¹⁴ The Tribunal’s task in assessing the impact on human well-being and amenity of this particular proposal requires weight to be given to all of these elements concurrent with, and in addition to, the specific criteria identified in the policy and in the Mitchell Shire Plan. In terms of the impact on human well-being, social, cultural and environmental impacts include impacts on:

¹⁴ Romsey at [360].

- 40.1 acoustic amenity – in terms of the adverse impacts from noise, particularly on sleep and, therefore, health;
- 40.2 the local landscape – the negative visual impact of the proposal and the impact on the cultural element embodied in the landscape;
- 40.3 the local flora and fauna – particularly the proposed native vegetation clearance and loss of habitat for native birds and animals along Homewood Road and the birds and bats that will be necessarily killed during the operation of the turbines; and
- 40.4 increased fire risk – risk of fire from the turbines and the reduced ability to combat fire using aerial fire-fighting techniques.

41. As identified in *Romsey* well-being also includes an economic element. Here, the Guardians local witnesses (as well as many of the lay objectors) gave evidence (or made submissions) of their concerns that their property values will be substantially reduced should the proposal go ahead. Many of them also gave evidence that they are concerned about the adverse health impacts from noise and some intend to sell their properties, notwithstanding that they will lose a substantial amount of money, in order to protect their own health and well-being and/or the health and well-being of their children - refer the statements and evidence of:

- 41.1 Dr Adam McCarthy who makes plain his concern for his family's health and well-being in his written statement and who gave evidence that he would simply sell up and leave if the proposal were approved;
- 41.2 Peter Hill details his belief that property values will be substantially reduced in his written statement at paragraph [36]-[38] and, having identified that

financial impact, makes plain that he and his partner would rather suffer the financial loss in selling up and leaving the area than remain and suffer impacts from turbine noise.

42. The communities' concerns that this proposal will have a substantial negative impact on the value of their properties has support from recent authority; even where the proposal is merely approved. In *Raab v Raab*¹⁵ Federal Magistrate Hughes, in dealing with a family law property settlement was required to make a decision about the impact of a proposed wind farm in rural Victoria on the value of land comprising part of the parties' joint property. The parties led evidence from expert property valuers, both of whom agreed that the proposed windfarm had a substantial negative impact on the value of the property. The initial valuation provided a value for the property of \$4,440,000 with no wind farm; and \$3,550,000 with a wind farm, a difference of \$890,000.¹⁶ The wife, not satisfied with that valuation, obtained a further valuation. The wife's valuer concluded that the property was worth \$3,135,000 without the windfarm and \$2,600,000 with the wind farm.¹⁷ Although there was a slight difference between husband's and wife's valuer's appraisals without the wind farm, both agreed that the reduction in value on account of the proposed and approved windfarm was substantial (respectively \$535,000 and \$600,000 or around 17%).¹⁸ The Magistrate held, on the basis that the planning permit for the wind farm had already been granted, that it was more likely than not to go ahead and took into account the reduction in the

¹⁵ [2012] FMCAfam 1189.

¹⁶ Ibid at [54].

¹⁷ Refer the table at [67].

¹⁸ Ibid.

value of the property the result of that wind farm in assessing the parties' entitlement to share in the joint property.¹⁹

43. As the economic element of the proposal is relevant to the consideration of human well-being it is not only the reduction in property values that is relevant to that consideration, but also the economic impact that flows from having settled members of the community leave that community to escape turbine noise and other adverse impacts. Moreover, there is the negative economic impact on the community that flows from making the area less attractive to potential new members of that community, particularly people who are potential "lifestylers", like Peter Hill and his partner Cameron. Making an area less attractive to people generally must have an adverse social and cultural impact as well.
44. It is evident that the impacts identified above, together, have already caused a degree of unhappiness and discontent in this community which the evidence suggests will only increase should the proposal be permitted. Unhappiness and discontent is a social impact detrimental to human well-being.²⁰
45. These significant, negative and adverse impacts (collectively they cannot be considered as "minimal impacts") on the amenity of the area; and on human wellbeing and amenity are to be considered as a cost to the community to be weighed against the benefits (claimed, perceived or otherwise) of this particular proposal.

No net community benefit proven: no proof of benefit to this community at all

46. Apart from assertions about powering a certain number of homes and claims about reducing greenhouse gases, the applicant has not led any evidence to prove, to any

¹⁹ Ibid at [68]-[73].

²⁰ Romsey at [354].

recognised standard, that there will be a net community benefit from its proposal, sufficient to outweigh the costs to be suffered by this community. Indeed, the applicant's expert planner Ms Butcher struggled to identify any benefit to this community, apart from a small but undefined number of permanent jobs. Ms Butcher argued that the benefit from this proposal was part of a "bigger picture", but could not relate that to any benefit that might be enjoyed by anyone living in this community: there is nothing to support the applicant's submissions at 5.3, save assertion.

47. The applicant elected not to lead any evidence to support its assertions that this particular proposal will result in significant reductions in CO₂ emissions. Evidence from the bar table is not sufficient; there is nothing to support its submission at 5.2(h). The applicant then goes on to criticise Mr Cumming and asserts that his evidence is irrelevant. Contrary to the applicant's submission it is very much the Tribunal's role "*to balance environmental, social and economic matters in favour of net community benefit and sustainable development*": the policy, section 5.1. If this proposal does not reduce GHG to the degree claimed or at all, there will simply be no net community benefit, either to this community or to the wider community: there will simply be no benefit to Ms Butcher's "bigger picture".
48. The Guardians lead evidence from Mr Hamish Cumming, a mechanical engineer with 25 years international experience. He gave evidence that this project will not reduce GHG by anything like the amount claimed and that over the project's entire operational life it may not even abate the GHG generated to build and maintain the project. Mr Cumming was cross-examined at length, but resisted any suggestion that his analysis was wrong; his evidence should be accepted.

49. While the applicant in its submissions is highly critical of Mr Cumming, it has nothing to say at all about the learned studies annexed to his statement, on which Mr Cumming relied, as being consistent with his observations and investigations in Australia. Mr Cumming relied upon a Dutch study carried out by C (Kees) le Pair, published on August 28, 2012 (annexure 3). The author, contemplating the situation where the Netherland's wind power generation capacity increases to contribute 20% of total power output, concluded that there will be: "*a further dramatic decrease of the fuel-replacing effectiveness. In a previous study, we used a model in which the most conservative scenario had a thus defined windpenetration of 20%. We found that in that case savings were already negative, which means that wind developments actually caused an increase in fossil fuel consumption. The present study based on actual data shows that we are well on the way to reach that stage.*" Importantly, this study was based upon actual generation data.
50. Mr Cumming relied upon another study carried out in Ireland, again based on actual generation data, which challenges the GHG abatement claims made by wind farm developers. Joseph Wheatley published "*Quantifying CO2 savings from wind power: Ireland*" on October 4, 2012 (annexure 4). The abstract states: "*The contribution of wind power generation to operational CO2 savings is investigated for the Irish electricity grid. Wind contributed 17% of electricity demand in 2011 and reduced CO2 emissions by 9%. Wind energy saved 0.28 tCO2/MWh on average, relative to a grid carbon intensity in the absence of wind of 0.53tCO2/MWh. Emissions savings are at the lower end of expectations. It is likely that this reflects decreasing effectiveness of wind power as wind penetration increases.* In the body of the report the author states: *Based on this CO2 data, and*

a careful treatment of the wind and system demand, we estimate wind savings of 0.28tCO2/MWh with implied effectiveness of only 53%.” That is, wind power is around half as effective at reducing CO2 emissions as claimed. Another observation made by the author is that: “Assessments of the economic or environmental benefit of wind power are not credible unless they are based on accurate emissions (and fuel) savings. This study suggests that savings may be lower than contemplated by public agencies to date.”

51. Mr Cumming made the same point: that the information put to him by the applicant was all based on models using incorrect assumptions, rather than actual data showing the increase in coal use that he had identified from publicly available information. He also relied upon a statement from Dr Philip Bratby in the Den Brook wind farm planning appeal in the UK, which also supports the Dutch and Irish studies. The windfarm developer in that case had claimed CO2 emissions savings of between 37,291-40,681 tonnes for its proposed wind farm (at [25]). Dr Bratby concludes (at [74]), based on numerous considerations (refer paragraphs [25]-[74]) that the developer had:

overstated the CO2 emissions saved by a factor of at least 37,291 / 10,434 = 3.6. Without an independent assessment of the effect of wind turbines on the CO2 emissions of conventional power stations, without a realistic calculation of the pay back time and without the appellant [developer] disclosing the electricity that will be consumed by the proposed wind turbines, it is not possible to be more precise about the CO2 emissions saved. However the above figure of 10,434 tonnes/yr is clearly conservatively high. It is indeed possible that there would be no net CO2 emissions savings from the proposal.

52. The conclusions reached by Dr Bratby in his proof of evidence and the studies from the Netherlands and Ireland are consistent with what Mr Cumming has found in his research on the performance of wind farms in Australia. Mr Cumming gave evidence that the increase in coal use caused by the intermittent and unpredictable

nature of wind power is largely due to the “ramping up and ramping down” that occurs at thermal electricity generation plants in order to accommodate the highly intermittent and unpredictable nature of wind power generation (refer the data annexed to his statement from windfarmperformance.info). This topic is covered in detail in the Irish study at page 2 and 8; in the Dutch study and in Dr Bratby’s evidence at paragraphs [61]-[71]. Dr Bratby at [62] cites the E.ON Netz Wind Report 2005 covering a large grid network in Germany which states:

Wind energy is only able to replace traditional power stations to a limited extent. Their dependence on the prevailing wind conditions means that wind power has a limited load factor even when technically available. It is not possible to guarantee its use for the continual cover of electricity consumption. Consequently, traditional power stations with capacities equal to 90% of the installed wind power capacity must be permanently online in order to guarantee power supply at all times.

53. The applicant wants the Tribunal to reject Mr Cumming’s evidence. However, the applicant also needs the Tribunal to reject the conclusions reached in 3 independent studies from the Netherlands, Ireland and the UK. It is submitted that the applicant did not lead any credible evidence to prove its claims about GHG abatement because there is no such evidence. The maxim that “*all evidence is to be weighed according to the power of one party to produce it and of the other to contradict it*”²¹ is applicable here.
54. On the issue of claimed GHG abatement, the applicant led no evidence at all (apart from assertions from the bar table), whereas the Guardians led cogent and compelling evidence from Mr Cumming, supported by independent overseas studies. It would be inappropriate to act on the untested bar table assertions made by the applicant, while rejecting the tested and well supported evidence of Mr Cumming.

²¹ *Blatch v Archer* (1774) 98 ER 969 at 970.

55. The Tribunal is invited to find that this particular proposal will not reduce GHG to anywhere near the extent claimed; and, it is submitted the Tribunal is entitled to make that finding on the evidence before it. Accordingly, the Tribunal's deliberations should be made on the basis that the applicant has simply failed to prove any net community benefit from this proposal. Moreover, it has manifestly failed to show that there will be any measurable benefit to this particular community: indeed Ms Butcher's evidence confirmed that there will be no such benefit.

The planning scheme and “the policy”.

56. The responsible authority has already delivered extensive written submissions on the relevant planning provisions (“Substantive Submission on Behalf of the Responsible Authority”, dated 29 January 2013).

57. Pertinent to these submissions the responsible authority identifies clause 11 of the planning scheme which, *inter alia*, provides:

Planning is to recognise the need for, and as far as practicable contribute towards:

- *Health and safety.*

...

Planning is to prevent environmental problems created by citing incompatible land uses close together.

58. Of critical concern to the Guardians is the adverse impact on human well-being and amenity which includes “health and safety”. The evidence demonstrates that there will be a significant impact on human well-being and amenity simply because there are too many homes, too close to this proposed wind energy facility.

59. Noise is an environmental problem which, in the circumstances of this proposal, means that the site chosen will result in an incompatible land use. Refer also clause 13.04-1 the aim of which is to use land separation techniques to ensure that “community amenity is not reduced by noise emissions.”
60. The responsible authority also refers to clause 15.02-1 and the objective of which is to “encourage land use and development that is consistent with the efficient use of energy and the minimisation of greenhouse gas emissions.” The applicant has not led any evidence to prove that this application, if approved, will as a matter of fact reduce greenhouse gases to the degree claimed or at all. The Guardians have lead evidence to challenge the applicant’s claims in that respect.
61. Clause 15.02-1 does not create a presumption that wind energy facilities result in “the efficient use of energy or the minimisation of greenhouse gas emissions”. Indeed, that clause does not mention wind energy facilities at all. The term “renewable energy” is not synonymous with an energy generation system which reduces greenhouse gases to any significant degree: “renewable” does not necessarily mean “clean”.
62. The responsible authority also referred to clause 19.01-1 which, *inter alia*, provides:

To promote the provision of renewable energy in a manner that ensures appropriate siting and design considerations are met.

Strategies

Facilitate renewable energy development in appropriate locations.

...

In considering proposals for renewable energy, consideration should be given to the economic and environmental benefits to the broader community of renewable energy generation while also considering the

need to minimise the effects of a proposal on the local community and environment. (emphasis added)

63. That clause goes on to refer to policy guidelines which must be considered as relevant, including the “*Policy and Planning Guidelines for Development of Wind Energy Facilities in Victoria* (August 2011). It is relevant to note here that clause 52.32 “Wind Energy Facility” references the most recent version of the policy issued in July 2012. It is that version of the policy which is relevant to the tribunal’s consideration of this application.²²
64. Clause 19.01-1 requires:
 - 64.1 consideration of the economic and environmental benefits to the broader community; and
 - 64.2 consideration of the need to minimise the effects of the proposal on the local community and environment.
65. Consideration of the economic and environmental benefits is, it is submitted, as much a matter of evidence as is the consideration of the effects of the proposal on the local community and environment. That is, there is no evidentiary presumption that there are economic and environmental benefits from a wind energy facility; both of these matters are subject to proof. The fact that the applicant points to panel decisions in its favour is indicative only of the fact that wind energy facility proponents have never previously been put to proof over their claims regarding greenhouse gas abatement and/or their claims regarding the economic benefits of wind energy facilities.
66. The responsible authority submits the question for the tribunal is to consider whether an appropriate balance can be struck between support for wind energy

²² *The Sisters Wind Farm Pty Ltd v Moyne Shire Council & Ors* [2012] VSC 324.

facilities and the policies in the planning scheme aimed at protecting landscapes and ecologically significant flora and fauna. The Guardians submit that when consideration is given to the impact on human well-being (in terms of the concept identified in *Romsey*) and amenity (among other policies), in this case, the balance favours rejection of this proposal.

67. The responsible authority's submissions (at [9] and following) focus on:
 - 67.1 the visual landscape significance of the Trawool Valley;
 - 67.2 the flora and fauna values impacted on by the proposed development;
 - 67.3 loss of vegetation on land subject to salinity and erosion.
68. The Guardians support the responsible authority's submissions in that regard and add some further observations below.
69. The responsible authority, however, has not presented a case concerned with wind turbine noise and the consequential impact on human well-being and amenity. The Guardians' submissions focus, and place emphasis, upon those considerations as follows.

Amenity Impacts: requires consideration of the impacts as a whole

70. Clause 52.32 of the planning scheme sets out its purpose as being:

To facilitate the establishment and expansion of wind energy facilities, in appropriate locations, with minimal impact on the amenity of the area.
71. In order to properly address the question of the impact on the amenity of the area it is submitted that the site and the surrounding area are required to be "accurately described"; so much is recognised in clause 52.32-4 which provides inter alia:

Application requirements

An application must be accompanied by the following information as appropriate:

Site and context analysis

*A site and context analysis may use a site plan, photographs or other techniques to **accurately describe the** site and **surrounding area** and must include the following information:*

...

In relation to the surrounding area:

...

- *Direction and distances to nearby dwellings, townships, urban areas, significant conservation and recreation areas, water features, tourist routes and walking tracks, major roads, airports, aerodromes and existing and proposed wind energy facilities*
- *The siting and use of buildings on adjacent properties*
- *Views to and from the site, including views from existing dwellings and key vantage points including major roads, walking tracks, tourist routes and regional population growth corridors*
- *Sites of flora and fauna listed under the Flora and Fauna Act 1988 and Environment Protection and Biodiversity Conservation Act 1999 (Cwth) Acts, including significant habitat corridors, and movement corridors for these fauna*
- *Sites of cultural heritage significance*
- ...
- *Location of any land included in the schedule to clause 52.32-2 of the planning scheme*
- *Any other notable features or characteristics of the area*
- *Bushfire risks.*

72. The applicant failed to provide its expert witnesses with an accurate description of the number of residences or their locations within 10 km of the proposed windfarm. Mr Moir's assessment of the impact on landscape values was premised (incorrectly) on his understanding that there were only 145 residences within 12 km of the proposed site. The applicant's other witnesses also relied upon that

same erroneous assumption (for example, Ms Butcher in her statement defines the surrounding area as “sparsely populated” at paragraph [12] relying upon the incorrect assumption referenced at paragraph [132]). Although Mr Moir and Ms Butcher explained that they had simply relied upon what the applicant had told them, these are expert witnesses who are required to turn an independent mind to their task and not simply rely upon everything that their client tells them.

73. That assumption substantially underestimates the number of residences which will potentially suffer a loss of visual amenity, as well as the numbers of persons whose well-being will otherwise be negatively impacted. Exhibit LG 59 (Mr Hill gave evidence about its creation) shows that the applicant failed to have regard to an additional 250 homes within 10 km of the proposed site, homes which were simply not considered in the applicant’s evidence, comprising:
 - 73.1 42 dwellings within 5 km;
 - 73.2 155 dwellings between 5km and 8 km;
 - 73.3 54 dwellings between 8 and 10 km.
74. The opinion evidence led by the applicant was based upon a seriously erroneous assumption. The weight to be given to those opinions must, accordingly, be diminished. Moreover, the assessment of the impact on human well-being and amenity is to be made by reference to some 400 residences (ie the 145 considered by the applicant and the 250 which were ignored) within 10 km not a mere 145 as presented by the applicant.

Noise impacts to be assessed independently of the New Zealand standard

75. The purpose of clause 52.32 is based on facilitating the appropriate siting of wind energy facilities provided there is “minimal impact on the amenity of the area”.

The applicant places great stock in its claimed compliance with the New Zealand standard NSZ6808:2010. However, none of its expert witnesses addressed the independent noise effects requirement in clause 52.32-5, the “Decision Guidelines” which provide, inter alia:

Before deciding on an application, in addition to the decision guidelines of Clause 65, the responsible authority must consider, as appropriate:

...

- ***The effect of the proposal on the surrounding area in terms of noise, blade glint, shadow flicker and electromagnetic interference.***

76. Had the intention of the policy been to exhaustively limit the question of noise effects to the considerations contained in the New Zealand standard it would have been a very simple matter to have said so. However, that is not what the policy says and it is submitted that the effect of noise on the surrounding area must be considered along with the limited considerations provided by the New Zealand standard.
77. Mr Cooper gave detailed evidence both written and oral on the likely impact from this proposal on annoyance and sleep disturbance. He also gave evidence concerning the serious limitations of the New Zealand standard to properly account for noise impacts. Mr Cooper, unique amongst all witnesses, actually addressed the requirement to independently assess the noise effects as per the requirement above, and also addressed in specific and considerable detail section 5.1.1 of the policy. It is submitted that his evidence on these topics has to be considered (because it is what clause 52.32-5 and the policy requires) and accepted because the applicant failed to lead evidence on that part of the policy at all. Indeed, its acoustic experts agreed that there will be a significant number of occasions (night-time or when there is wind-shear) when wind turbine noise levels

will be substantially above the background levels. In respect of noise it is submitted that the Tribunal is required to have regard to:

- 77.1 NZS 6808:2010;
 - 77.2 noise effects of the proposal generally, as per 52.35-5; and
 - 77.3 noise impacts on human well-being (as indentified in *Romsey*) and amenity, generally, as per section 5.1.1 of the policy.
78. The first point to notice is that the New Zealand standard is only one matter for consideration on the noise impact question and, it is submitted, its focus on predicting and measuring audible noise in terms of dB(A) completely overlooks the substantial low frequency noise component generated by very large industrial wind turbines. It is the continual and inescapable nature of turbine noise which becomes even more noticeable and annoying at night-time that requires more careful consideration of the true noise impacts on the wellbeing and amenity of the many residents in this community. That is, consideration going beyond what is specified in the New Zealand standard.
79. Australian communities having to live with industrial wind turbines report turbine noise as being annoying and irritating and more so than any other noise source (see below). So much is recognised in exhibit A89 (tendered by the applicant) which found wind turbine noise to be considerably more annoying at far lower noise levels than aircraft, road and rail noise. Dr Burgermeister agreed that aircraft, road and rail noise are generally intermittent noise sources; all of which diminish at night-time – there are night-time airport curfews in many cities and most drivers do have a tendency to go home and sleep at night, traffic noise is usually at its quietest after midnight and before dawn.

80. Wind turbines by contrast, generate audible noise including low frequency noise for long and continuous periods and particularly do so at night-time (see below).

It is submitted that it is this feature makes the noise from large industrial wind turbines so much more annoying than any other noise source and renders largely irrelevant (or least unhelpful) the dB(A) limit set by the New Zealand standard.

Noise, sleep & health: essential to “human well-being and amenity”

81. There is sufficient evidence before the Tribunal to find that this proposal would generate audible and continual low frequency noise sufficient to disturb sleep on a regular basis and that the impact of this proposal in that regard will be experienced by a significant number of people on a significant number of occasions.
82. The World Health Organisation in its Night Noise Guidelines for Europe makes the following statements concerning noise sleep and health:²³

WHO defines health as a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity, and recognizes the enjoyment of the highest attainable standard of health as one of the fundamental rights of every human being. Environmental noise is a threat to public health, having negative impacts on human health and well-being.²⁴

...

There is plenty of evidence that sleep is a biological necessity, and disturbed sleep is associated with a number of health problems. Studies of sleep disturbance in children and in shift workers clearly show the adverse effects.²⁵

...

The review of available evidence leads to the following conclusions.²⁶

- *Sleep is a biological necessity and disturbed sleep is associated with a number of adverse impacts on health.*

²³ LG 76, tab 1. The same definition is relied upon in Romsey at [359].

²⁴ pVII.

²⁵ pXI.

²⁶ pXII.

- *There is sufficient evidence for biological effects of noise during sleep: increase in heart rate, arousals, sleep stage changes and awakening.*
 - *There is sufficient evidence that night noise exposure causes self-reported sleep disturbance, increase in medicine use, increase in body movements and (environmental) insomnia.*
 - *While noise-induced sleep disturbance is viewed as a health problem in itself (environmental insomnia), it also leads to further consequences for health and wellbeing.*
83. Sleep disturbance, and over the longer term, sleep deprivation is the most frequent and serious complaint made by those living adjacent to wind farms in Australia (and overseas) and is based on the fact that turbines tend to operate continually at night-time. As recognised by the World Health Organisation sleep disturbance is in and of itself an adverse health effect, which brings with it associated health effects both psychological and physiological, bringing consequences for health and wellbeing.
84. Annexure 2 to the statement of Hamish Cumming, Vol 2, tab 24 gives extracts of data from the website windfarmperformance.info which collects from the AEMO all of the output data from all wind farms connected to the South-Eastern electricity grid, including all Victorian wind farms. The graphs provide “Wind Farm Output (MW)” on a continual 24 hour basis. Those attached to Mr Cumming’s statement show, on average, that the greatest level of output occurs in the hours from midnight to roughly 8am-10am, with output falling considerably during the daytime, before increasing again in the evening. The Tribunal is invited to consider that website where dates other than those provided can be selected and considered.
85. In LG 76, tab 14 appear 13 sworn affidavits from residents living adjacent to AGL’s Hallett 2 windfarm near Mount Bryan in South Australia. The deponents

describe the annoying character of turbine noise, particularly the fact that it is often continuous throughout the night, and speak of adverse sleep impacts at considerable distances from the turbines.

- 85.1 Amy Jayne Bailey Hill, 2.94 km from the closest turbines describes the noise from the turbines as irritating, driving her indoors at times and described her children having trouble sleeping.
- 85.2 Kevin John Eldridge, 3.09 km from the nearest turbines describes the turbine noise as most annoying at night when there are no other sounds and that turbine noise has caused him to regularly suffer from broken sleep.
- 85.3 Samantha Jane Johnson, 3.1 km from the nearest turbines describes the turbine noise as intrusive and annoying and the worst part of it is that it is so continual that she feels trapped when at home. She cannot escape it which makes it so annoying. This continual noise from turbines has an effect on her ability to sleep and she has problems staying asleep.
- 85.4 Melanie Joy Moran, 2.99 km from the nearest turbines describes the noise as a low pitched “hum” which is annoying and sometimes very annoying, bothering her most because “it just does not stop”; lasting for hours and hours. She is most disturbed at night when things are quiet and her sleep pattern has been disturbed at least 2 or 3 nights every week. Before the turbines began operating she had no trouble getting off to sleep and used to sleep very well.
- 85.5 Debra Ann Quinn, 2.8 km from the nearest turbines describes the noise from these turbines as like living at an airport with the plane’s engines forever running and as a constant repetitive sound which can be very irritating. She

described her sleep being disturbed on a number of occasions over the 11 months the turbines had been operating; having trouble getting to sleep and on occasions been woken up in the middle of the night by turbine noise. She also experiences a pulsating or drumming sensation in her ears and, on occasions, a ringing sensation for which she saw her GP who found her ear canals looked irritated, but not infected.

- 85.6 Eileen Moira Quinn, 3.68km from the nearest turbines describes the turbine noise, depending on weather conditions, to be constant and pervading with the noise comparable to the sound of a plane droning constantly. The noise is often at its worst at night and impacts on her ability to sleep. Where she used to sleep soundly before they began operating, she is woken up by wind turbine noise at various times of night and this occurs frequently. Her sleep has become broken and fitful as a result of the turbine noise. She also describes headaches becoming more frequent and developing tinnitus, a constant ringing in her ears. She notes that that she has fewer headaches and the symptoms of her tinnitus disappears when she is away from the area.
- 85.7 Rosemary Gladys Quinn, 2 km from the nearest turbines describes the noise as very annoying as it is there all day and every day since they started operating and has found that her sleep has been disturbed on a regular basis since the turbines began operating. Whenever she goes away from home, staying somewhere else, she sleeps well.
- 85.8 Joanne Elizabeth Simpson, 3.02 km from the nearest turbines describes the noise as irritating and very annoying because it can be extreme for hours and sometimes days on end. She finds it hard to get to sleep because of wind turbine noise and is woken up by that noise most nights. Before the wind

turbines started she slept well most of the time and easily got between 7 or 8 hours of solid sleep every night.

- 85.9 Graham Andrew Thomas, 1.5 km from the nearest turbines describes the turbine noise as constant and irritating with many occasions where the noise from each turbine sounds like a jet passing overhead, but which never actually passes. He describes his sleep being disturbed on a regular basis, having trouble getting to sleep but also been woken up by the noise from the turbines and being unable to get back to sleep because the turbine noise is very annoying. His sleep is disturbed by turbine noise at least 20 or so days every month. He suffers from headaches which had never been a problem for him in the past. Whenever he is away from the wind turbines for any length of time his headaches disappear and he is able to get 7 or 8 hours of unbroken sleep.
- 85.10 Robyn Anne Thomas (wife of Graham Andrew) also lives 1.5 km from the nearest turbines and describes the turbine noise outside as extremely annoying, with its endless monotonous grinding, such that on occasions she gives up on her gardening outside and moves inside the house to escape it. She is aware of turbine noise from the time she returns home from work, right through until she goes to bed around midnight. The noise also causes her to lose sleep, waking her up between the hours of 2-3am at least 3 times a week. The only time she sleeps well are when the turbines are not working or when there is rain on the roof which seems to block out the noise from the turbines.
- 85.11 Laura Elaine Wedding, 1.98 km from the nearest turbines describes the turbine noise as more noticeable and most annoying in calm conditions when there is little breeze around the home. Her normal sleeping pattern has been

affected by turbine noise which makes it hard to drift off to sleep and sometimes she is woken up by turbine noise around 3-4am, she then has trouble falling back to sleep because of the sound of the turbines. In the last few months she started suffering from frequent headaches where she had only rarely suffered headaches before. The headaches involve her head feeling full and she can feel there is pressure in her ears. She notices that when she is away from the turbines for a while the headaches stop and she feels a sense of relief.

- 85.12 Paul Jeffrey Wedding (is the husband of Laura Wedding) and also lives 1.98 km from the nearest turbines. He describes the turbine noise at home as equivalent to a low-volume jet turbine, involving a buzzing sound and a whoosh noise which is annoying, that can be heard outside most days and inside the house at least 2 days every week. The noise from turbines becomes more noticeable during the evening as the temperature and wind drops at home. Even with the wind blowing from his home and towards the turbines the noise is noticeable and annoying. The noise is most annoying at night and affects his sleep on a regular basis, waking him up 2 nights a week which usually occurs between midnight and 2am. He cannot recall being woken up by noise during the night before the wind turbines started, except during the occasional heavy thunderstorm. In recent months he started suffering headaches which had never been a problem before. When away from home and the vicinity of the turbines his headaches stop.

86. This evidence (the only sworn evidence before the Tribunal) should be given considerable weight (and much greater weight than the volumes of evidence given from the bar table by the applicant's Counsel). True it is that these witnesses were

not called to be cross-examined. However, the descriptions of their personal experiences both in terms of the annoying nature of turbine noise and the impact on sleep, headaches, pressure in the ears etc is consistent with that described by David Mortimer and referenced in the various surveys conducted at operating wind farms, as well as in the volume of literature presented by Dr Laurie.

87. The experience of Graham and Robyn Thomas living 1.5 km from turbines is relevant to what would be experienced by the Waughs in their new home at the same distance from even larger turbines here.
88. This was not a Royal Commission or a roving enquiry requiring hundreds of witnesses to be called to give evidence of the impact of turbine noise on sleep and health etc. The Guardians could have easily turned this hearing into such an enquiry by calling any number of witnesses who live next to wind farms at Waterloo and Mount Bryan in South Australia; Waubra and Macarthur in Victoria; Cullerin and Capital in New South Wales.
89. Instead, the Guardians seek to rely upon the affidavits summarised above as well as the evidence given in person by Mr David Mortimer.
90. It is submitted that the Tribunal should find and is entitled to find that David Mortimer is a truthful witness who gave detailed evidence of the impacts that wind turbine noise has on him when living at his home 2.5 km from turbines. His written statement, Vol 2, tab 16 was supplemented by his oral evidence.
91. What is particularly notable about Mr Mortimer is that he is a contractor with this particular applicant, Infigen who receives considerable income from hosting turbines for the applicant: his evidence cannot be dismissed on the basis that he is somehow “jealous” of neighbours receiving income from turbines. He described

in careful detail the impact of turbine noise on his sleep patterns and its relationship to symptoms and sensations which he experiences when at home, but which disappear or moderate whenever he is away from home. While he describes the turbines being audible on occasions [16] “a resonant drumming, thumping and a low whooshing sound.” He also described a pressure pulse sensation and drumming sensation in his head which he suffers while inside his home and that on these occasions he cannot hear the turbines operating inside his home.

92. The pressure sensations being described by Mr Mortimer and others (see above, for example, Debra Ann Quinn, Eileen Moira Quinn, Laura Elaine Wedding), it is submitted, is the impact of substantial air pressure variations caused by the turbine blades and which permeate Mr Mortimer’s home causing the pressure sensations he describes.
93. Exhibit LG 73 (the Horns Rev photograph) is a graphic depiction of the turbine “wake turbulence”, large plumes of turbulent air created by the blades which travel large distances. Refer also to the paper annexed to the statement of Dr Adam McCarthy by Ian Shepherd “Wake Induced Wind Turbine Noise”. In the Shirley Wisconsin report, Dr Paul Schomer discussed the implications of their measurements and observed:

The measurements support the hypothesis developed in (I) that the primary frequencies are very low, in the range of several tenths of a Hertz up to several Hertz. The coherence analysis shows that only the very low frequencies appear throughout the house and are clearly related to the blade passage frequency of the turbine. As Figure 5 shows, the house is acting like a cavity and indeed at 5 Hz and below, where the wavelength is 200 Ft or greater, the house is small compared to the wavelength.

94. The description of wavelengths being “200 Ft or greater” (61 m) is consistent with the observations and experiences of witnesses that they are being subjected to large air pressure variations which is simply not accounted for by the dB(A) weighting – which is not designed to measure low frequency noise – upon which the New Zealand standard is entirely based.
95. The effects, sensations and symptoms described by Mr Mortimer as occurring when the wind turbines are inaudible are entirely consistent with what is reported by the residents the subject of the Shirley Wisconsin report.²⁷ That study was carried out at 3 homes which are all abandoned by their residents “due to negative health effects experienced since the Shirley Wind facility had started up.” The homes were referred to as:
- 95.1 R1: 3,500 feet or 1067m to the nearest turbine WTG 6 – the next closest is WTG 5 (R1 is a little further from 1 turbine than Wollert Glen’s new home is from at least 4 larger turbines).
- 95.2 R2: 1100 feet or 335m from 1 turbine WTG 8, the next closest is WTG 7, which appears to be twice the distance from R2.
- 95.3 R3: 7,000 feet or 2,133m.
96. The residents who abandoned these homes “largely report wind turbines as inaudible”.²⁸
97. It is submitted that people do not abandon their homes in the absence of strong reasons to do so. From the map that appears on p4 of the Shirley report it is evident that that particular windfarm involves a scatter of a few turbines set out amongst residential homes in an open rural setting. Here, however, we are talking

²⁷ Waubra Foundation book, tab 21-23.

²⁸ Ibid, Paul Schomer at p1.

about a cluster of 16 much larger turbines, at a considerable elevation above the surrounding homes, with houses at comparable distances to the abandoned Wisconsin home R3 (2,133m), for example:²⁹

97.1 R26 = 2,440m

97.2 R27 = 2,512m

97.3 R37 = 2083m

97.4 R62 = 2089m

97.5 R75 = 2,267m

97.6 R77 = 2,493m

98. Mr Turnbull, obviously not a betting man, declined to offer a guarantee to the owners of these properties they would not need to abandon them on account of turbine noise impacts.

99. In addition, the evidence Mr Mortimer, the affidavits from the residents at Mount Bryan and the experiences of those living at the Shirley Wisconsin windfarm are further corroborated in the surveys conducted at the Waterloo wind farm in South Australia and at the Cullerin Range wind farm.³⁰

100. Tab 7, is a survey by a University of Adelaide Masters Student of the community at Waterloo in South Australia. The Survey results showed that overall more than 70% of the respondents reported being negatively affected by wind farm noise. 35% of the respondents stated that he had been moderately affected. 19% claim they had been very affected. A large proportion of respondents had complained to the developer, the local Council and the EPA. 38% claimed experiencing health

²⁹ Sonus vol 6, tab 126, page 15.

³⁰ Waubra Foundation book, tabs 7, 8 and 9.

issues caused by wind farm noise. Health issues mainly related to sleep deprivation and headaches. The author lists a number of responses including the fact that “several respondents have bought property in other areas where no wind farms are established” apparently to escape the noise from turbines.

101. Tab 8, is a further survey of the community at the Waterloo wind farm, carried out by a local resident, Mary Morris in April 2012. The windfarm commenced operation in late 2010. The survey largely confirmed the results of that done by the Master’s student from Adelaide University. Within 5 km of the turbines 56% of households were disturbed by daytime noise and the same proportion were disturbed by night-time noise. And within that distance, 39% experienced sleep disturbance. Dr Black agreed that the survey’s response rate of 55% was reasonably good for a community survey. The respondents reported: building vibration; and described turbine noise as roaring, thumping, grinding, whining, drumming, constant rumbling, can hear it over TV, had to keep window shut, whooshing, constant humming, had to relocate lounge room to hear the TV.
102. Tab 9 is a survey carried out in August 2012 of the community living near the Cullerin Range wind farm, that commenced operating in July 2009. At a distance out to 5 km, responses were received from 73% of all residences. 85.7% of which indicated noise was present during the day and/or night. 78.5% reported sleep disturbance from the noise generated by the wind energy development. At a distance out to 7.5 km responses were received from 70.8% of all residences. 82.4% of which indicated noise is present at their homes and property during the day and/or night. 76% of those households reported sleep disturbance.
103. While the applicant seeks to criticise or downplay the significance of the affidavits from the Mount Bryan residents, the evidence given by Mr Mortimer and these

community surveys, it is first to be noted that the response rates are more than reasonable for community surveys. It is also important to note that Mr Mortimer, the deponents to the affidavits and the people being surveyed are of a character and class (country people, principally farmers and their wives) that are not usually described as being “hypersensitive” or as coming from a group known to complain without good reason. It is submitted that these people are the least likely to complain about any adversity, be it fire, drought or flood. For these people to be moved to complain allows a strong inference to be drawn that there is good reason for them to do so.

Observations on the applicant’s submissions and evidence regarding noise

104. The applicant has made a number of submissions which require comment. At 7.2(a) it is said that Mr Cooper is wrong that the WHO levels were based on traffic noise only. There is nothing in the WHO Night-time Noise Guidelines for Europe that refers to, let alone takes account of, the noise from large industrial wind turbines in quiet rural environments, such as the Trawool Valley and Whiteheads Creek. As submitted above, the difference between wind turbine noise and noise sources such as road, aircraft and rail is that wind turbine noise is often continuous at night-time, whereas the noise from road traffic, aircraft and rail ordinarily diminishes between midnight and dawn. Moreover, the levels set in the WHO guidelines (upon which the limits in the New Zealand standard are set) are based on background noise levels in urban European environments which bear no relationship to the very low background noise levels in rural Victoria. For these reasons the applicant’s submissions at 8.1(c) are wrong and should be rejected.

105. 7.1(i)-(k): the Guardians do not submit that the New Zealand standard should be set aside or disregarded. To the extent that it does not account for the impact on the broad concept of human well-being and amenity it is simply of no assistance. To the extent that it touches on that question, it is required to be given appropriate weight. The New Zealand standard does not claim to provide absolute protection; nor does it claim to provide a definitive standard accounting for the broader concept of human well-being. It dismisses low frequency noise, which the evidence strongly suggests is an issue for wind farm neighbours. It is a reference document only and is to be considered as subordinate to section 5.1 and 5.1.1 of the policy and the mandatory requirement to assess the impact on human well-being and amenity. The plan and the policy could have said that compliance with the New Zealand standard means the responsible authority is entitled to be satisfied on the question of the impact on human well-being and amenity. However the terms of the plan and the policy make it clear that compliance with the New Zealand standard is neither exhaustive nor determinative of that question.
106. 8.1(b) claims that low frequency sound is covered by the noise level criteria the New Zealand standard. 5.5.2 of the New Zealand standard asserts that “measurements show that wind turbine sound does not contain a large proportion of low frequency components.” The standard ignores low frequency noise based on an assertion which is unsupported by the evidence and which is contradicted entirely by the Shirley Wisconsin study, the evidence of Mr Cooper and particularly the paper “Low-frequency noise from large wind turbines” by Moller and Pedersen.³¹ In that paper it was concluded at page 3742:

³¹ Waubra Foundation, tab 10.

When outdoor sound pressure levels in relevant neighbour distances are considered, the higher low-frequency content becomes even more pronounced. This is due to the air absorption, which reduces the higher frequencies a lot more than the lower frequencies. Even when A-weighted levels are considered, substantial part of the noise is at low frequencies, and for several of the investigated large turbines, the one-third-octave band with the highest level is at or below 250 Hz. It is thus beyond any doubt that the low frequency part of the spectrum plays an important role in the noise at the neighbours.

107. In that paper, the authors show graphic depictions Figures 11 and 12, pp3736 - 3737 of significant levels of low frequency noise present inside homes where the external level was 35dB(A) and 44dB(A) respectively. The New Zealand standard, having wrongly claimed low frequency noise is insignificant, then otherwise ignores it.
108. None of the applicant's witnesses rejected the conclusions reached by Prof Leventhall in exhibit LG 74 at page 95 on the topic of "Low frequency Noise and Stress". Prof Leventhall stated:

Any persistent and unwanted sound, low frequency or high frequency, is a stressor. Unfortunately, conventional methods of dealing with environmental noise stressors are A-weighted, which means that the presence of disturbing low frequency noise may not be detected. This absence of a measurement requirement for noise control officers to pursue the source of a low frequency noise, in turn leads to long-term stress effects in the low frequency noise complainant.

...

*Constant low frequency noise has been classified as a background stressor (Benton and Leventhall, 1994; Leventhall et al, 2003). Whilst it is acceptable, under the effects of cataclysmic personal stress, to withdraw from coping with normal daily demands, this is not permissible when exposed to a low-level background stress, although inadequate reserves of coping ability lead to the development of stress symptoms. In this way, **chronic psychophysiological damage may result from long-term exposure to an audible, low-level low frequency noise, which is left uncontrolled, despite complaints.***

109. Prof Leventhall confirms that the A-weighting is not an appropriate measure where low-frequency noise is constant, even at low levels. His conclusions reflect

perfectly the experiences of those living adjacent to wind farms using large industrial wind turbines (see above).

110. 8(1)(d) was not supported by Mr Turnbull or Dr Burgermeister. Neither of them claimed that the A-weighting was relevant to the measurement of infrasound levels. Both of them agreed that they would not use the A-weighting to measure low frequency noise; Mr Turnbull referred to the C-weighting as being appropriate for that purpose. As to infrasound, both asserted that the G-weighting is the appropriate measure. The New Zealand standard might treat the A-weighting “as a surrogate for achieving acceptable levels of low frequency sound and infrasound.” If that is so then the New Zealand standard is completely irrelevant in assessing the noise from large industrial wind turbines. 8.1(f) is wrong for the same reasons.
111. 8.1(e) is entirely unsupported by the evidence and is inconsistent with the findings by Moller and Pedersen in “Low-frequency noise from large wind turbines”³² that low-frequency turbine noise travels much further than the higher frequencies.
112. 8.3(e) conflates infrasound and low-frequency noise. It is clearly wrong where it is said that “much of the low-frequency sound below 100 Hz is below the audibility threshold”. It is generally accepted that frequencies above 20 Hz are audible even at low sound pressure levels. Mr Turnbull, Dr Burgermeister and Dr Black all agreed with that proposition. Reference is made to Prof Leventhal’s submission to the Senate and Dr Bergermeister’s evidence on this topic. However, Prof Leventhal’s statement to the Senate A42 at [12]-[13] is limited to a commentary on infrasound. Dr Burgermeister was cross-examined on this document and was unable to find any reference at all to the impact on nearby

³² Waubra Foundation, tab 10.

residents from audible low frequency noise from turbines. The paper prepared by Resonate for the SA EPA (A47) did not consider frequencies above 20 Hz so it has nothing meaningful to say about audible low frequency noise at all. That study came in for particular, and it is submitted justified, criticism from Mr Cooper.

113. The applicant, as did its witnesses, has sought to conflate infrasound and low-frequency noise and, having done so, to then rely upon claims that infrasound levels from wind turbines are below the threshold of perception. By definition, infrasound is inaudible, but that does not mean that it cannot be perceived as pressure in the ears, for example. However, low frequency noise above 20 Hz is audible. Low frequency noise is recognised in the literature as being more annoying, particularly where it is continual and even at low levels (Prof Leventhall above).
114. As submitted above, the blades from large industrial wind turbines generate large air pressure variations which provide a plausible explanation for the sensations and symptoms described by David Mortimer and many others. Perhaps the best analogy is the experience when driving a car at speed on the open road and someone winds down a rear window. The air pressure pulsing sensation experienced inside the cabin is uncomfortable and disconcerting; and usually results in the driver yelling at the rear seated passenger to “wind the window up”.
115. 8.4 makes a number of assertions about impact of noise and infrasound and low-frequency noise which are unsupported by the evidence and, indeed, contradicted by evidence from the many operating wind farms in Australia and overseas. Moreover, all of the applicant’s expert witnesses agreed that there is no safe level

set for infrasound or low frequency noise from wind turbines (or any source) by the New Zealand standard; or any other standard, for that matter.

116. 10.1: the applicant confuses “health” and “direct health impacts” with human well-being. This matter is dealt with in detail above and in light of the broad concept identified in *Romsey*. There is nothing in the balance of section 5.1 of the policy to support the applicant’s submissions. Its submissions in this regard simply fail to address the broader concept. This is not a case where the Guardians are alleging personal injury (physical or psychological) caused by the applicant requiring them to prove in a probabilistic sense (ie on the balance of probabilities) that the proposed wind turbines are (or will be) a substantial cause of any such injury. As submitted above, the enquiry required here is not so limited and to follow the path suggested by the applicant would be to fall into error. For the same reasons the submissions appearing in 10.2(h)-(l) should also be rejected.
117. 8.1(f) asserts that the Tribunal should act on the advice of specialist government agencies on health-related issues (except, of course, the NHMRC’s advice to authorities that a precautionary approach to the issue of health impacts from wind turbines is warranted – refer paragraph 140 below). And it asserts that there is no expert evidence to support the proposition that this facility will impact on the health of residents. In South Australia the EPA has taken the step of listening to the community at Waterloo and is setting out to carry out, with the assistance of the University of Adelaide, a detailed acoustic, sleep and health study into the serious impacts experienced by that community from wind turbine noise. The applicant’s expert witnesses sought to criticise and diminish the importance of every study, article or paper adverse to their client’s cause. It will be interesting to

see whether this applicant or any other wind farm developer is prepared to abide the event of the Waterloo study.

118. In any event, there is ample evidence of the adverse impacts on human well-being from industrial wind turbines (see above). Moreover, Dr Black, having made a series of wholly unsupported claims and assertions about direct health impacts from wind turbines agreed that there is no peer reviewed, field-based research which proves that there is no relationship between sleep disturbance or the sensations and symptoms described by residents living next to wind farms and the operation of large industrial wind turbines. Dr Black accepted the conclusion seen in LG 81 (Literature Review 2013: Association between Wind Turbine Noise and Human Distress) that there is “no published peer-reviewed study” showing no association between wind turbine noise and human distress.
119. 10.2 is a submission drawn from history which is neither helpful nor relevant to the considerations for this Tribunal. None of the cases or (panel decisions) required consideration of provisions in terms of sections 5.1 or 5.1.1 of the policy.
120. 10.2(a) is both wrong and irrelevant; the passage cited ignores sleep disturbance and focuses narrowly on “direct health effects” which as submitted above is not equivalent to the broad concept of human “well-being”.
121. 10.2(g): David Mortimer is a person who not only did not object to a wind farm he became a financial stakeholder, hosting turbines for this applicant, Infogen. He presents as an inconvenience to the applicant: he cannot be described as “jealous” because he is receiving considerable income; and despite being a previously willing participant, suffers from sleep and other adverse health effects (sensations

and symptoms) consistent with those described by other wind farm neighbours as well as described in the body of literature presented to the Tribunal.

122. 10.2(k) makes the same mistake that the applicant and its expert witnesses have made all along by conflating and confusing inaudible infrasound with audible low frequency noise. The passage cited refers to “infrasound” only, but the submission talks about “a causal link between the relatively low levels of noise produced by wind farms”. Infrasound is, by definition inaudible: whereas low frequency noise (generally accepted to be above 20 Hz) is audible; is produced at significant levels by large industrial wind turbines and is considered to be more annoying than any other noise source – refer exhibit A89.
123. 10.2(l): the applicant seeks support from a variety of sources none of which were ever required to deal with the terms of section 5.1 or 5.1.1 of the policy.
124. 10.4(d): the uncertainty claimed can be reduced by having the benefit of the research planned by the SA EPA or from surveys carried out at 2 or 3 operating wind farms, as suggested by the Tribunal.
125. 10.4(h): it is claimed that visibility of a windfarm influences the potential for annoyance from noise associated with living next to a wind farm. The obvious retort is that if a resident can see wind turbines he or she is much more likely to hear their noise and, therefore, to be annoyed by it. Dr Burgermeister’s very last answer was to agree that if wind turbines were visible there is no barrier to attenuate the noise; in which event, a resident is more likely to hear it and to be annoyed by it.
126. 10.4(e)-(i): satisfaction of the 40dB(A) or background plus 5dB(A) still leads to sleep disturbance at distances of more than 5 km. Sleep disturbance is recognised

by the WHO as itself an adverse health effect and sleep disturbance is known to be associated with continual low frequency noise in low background noise environments. Indeed, the WHO recognises that special consideration should be given to low frequency noise in quiet rural environments and recognises even low levels of low frequency noise as a problem for quality sleep, “*because low frequency noise (e.g. from ventilation systems) can disturb rest and sleep even at low sound pressure levels*” suggesting a far lower external limit than the limit relied upon in the New Zealand standard.³³

127. On the question of evidence, the applicant makes a variety of submissions in paragraph 10.3, which includes an attack on David Mortimer and the reliability of his evidence. These submissions are specious and should be rejected out of hand. Mr Mortimer presented as a careful and credible witness whose evidence the Tribunal is entitled to accept without reservation. Mr Mortimer was deliberately chosen because of his financial interest in the windfarm about which he complains. Developers routinely criticise wind farm neighbours who give evidence against them as simply being “jealous” of their neighbours who receive income from the developer. That argument does not wash with Mr Mortimer. Moreover, as submitted above, his evidence finds strong support in the affidavits from the Mount Bryan residents living next to the Hallett 2 wind farm, as well as the survey results from the Waterloo wind farm and Cullerin Range wind farm.
128. The attack on Dr Sarah Laurie fails not least because of the volume of material to which she drew the Tribunal’s attention. Although not experienced as witness she gave evidence in a forthright and candid manner and her evidence should be accepted. The applicant here seems to be playing the witness rather than the

³³ Vol 4, tab 91 WHO Guidelines for Community Noise, at pages 28 and 40.

evidence. The applicant did not bring any credible evidence to show that there is no association between wind turbine noise or air pressure variations generated by turbines and the anecdotal reports of sleep deprivation, or sensations and symptoms of the kind described Mr Mortimer and many others.

129. At 10.3(f) the applicant makes a submission concerning what it says was the partisan nature of Dr Laurie's evidence and her selective use of the sources on which she relied. The adage about not throwing stones inside glasshouses springs to mind.

130. As to the selective use of the literature, both Dr Black and Dr Burgermeister neglected to refer to or consider a whole raft of relevant and significant literature, including what appears in the Waubra Foundation book at tabs:

- 130.1 10 – Low-frequency noise from large wind turbines, Moller & Pedersen;
- 130.2 15 – Characterisation of noise in homes affected by wind turbine noise, Prof Con Doolan;
- 130.3 16 – Perception-based protection from low-frequency sounds may not be enough, Alec Salt;
- 130.4 17 – Numerical simulation of infrasound perception, with reference to prior reported laboratory effects, Malcom Swinbanks;
- 130.5 18 – An investigation on the physiological and psychological effects of infrasound of persons, Qibai and Shi;
- 130.6 20 – Wind turbine acoustic investigation: infrasound and low-frequency noise-a case study, Ambrose and Rand.
- 130.7 21-23 – or A67 – the Shirley Wisconsin report;

130.8 24 – Evaluating the impact of wind turbine noise on health-related quality of life, Daniel Sheppard;

130.9 25 – Effects of industrial wind turbine noise on sleep and health, Michael Nissenbaum.

131. And Dr Black and Dr Burgermesiter also neglected to refer to a relevant and significant paper annexed to Dr McCarthy's statement: "Wind turbine infra and low-frequency sound: warning signs that were not heard", by Richard James.

132. The applicant presented Dr Black as an expert witness on the health impacts from wind farms. Dr Black had no idea what the Pittsburgh Sleep Quality Index (PSQI) was when presented with a number of papers using that measure to identify the adverse impact of wind turbine noise on sleep quality. The PSQI survey has been used routinely to study sleep quality for over 20 years.

133. Dr Burgermeister was presented by the applicant as an expert acoustic witness providing a peer review of the Sonus assessments, as well as a criticism of Mr Cooper's peer review of those assessments. One relevant topic on which he gave evidence was the effect of atmospheric conditions on sound propagation and attenuation. He agreed that temperature inversions (seen when fog occurs) would result in turbine noise propagating further under these conditions. A number of the Guardians witnesses gave evidence about the peculiar acoustic characteristics of the Trawool Valley (eg hearing clearly the sound of cows mooing and dogs barking many kilometres distant) as well as the frequency with which fog fills the valley and on occasions when there is significant wind up on Cherry Tree range. It is submitted that these occasions will result in a greater degree of annoyance for residents than is accounted for by the New Zealand standard and the predictions

made by Sonus, because with little or no wind the background levels around the homes in the Valley will be low at times while the turbines are operating at their maximum output (i.e. rated power).

134. Another criticism of Dr Laurie is that she knew little or nothing about this particular project or the noise levels predicted by Sonus. A general theme throughout the evidence and submissions of the applicant emerges. All wind farms and wind turbines are precisely the same and evidence gathered from them, or predictions made based on their operation, can be safely relied upon by planning authorities at all times. That is, however, until it is shown that there are noise, sleep and other health problems at an existing windfarm which might result in the developer's proposal being rejected. In that event, the proposed windfarm becomes entirely unique, as do the turbines proposed to be used. The developer, here the applicant, then submits that no adverse inference can be drawn from the problems experienced at other wind farms or with other makes or models of wind turbines.

135. This theme is to be rejected. Industrial wind turbines have been operating in Australia for some years now and turbines of the size proposed here are operating at the Macarthur windfarm. Vestas 3MW V90 turbines operate at the Waterloo wind farm where homes have been abandoned and adverse noise effects of wind turbine noise are felt by a significant number of people within 5 km and a not insignificant number of people beyond that distance.

136. The evidence presented by the Guardians and the evidence of Dr Laurie of the observations and experience of people in Australia and overseas adversely impacted by wind turbine noise is cogent and compelling and cannot be ignored. It is submitted that this evidence can be safely acted upon and the evidence led by

the applicant seeking to distance itself from the widespread and general problems created by inappropriately sited wind farms can be safely rejected. Dr Laurie cannot fairly be described as “partisan”, given that she works as an unpaid volunteer for a non-profit organisation with the objective of protecting the community from low-frequency noise impacts, generally.

The precautionary principle: sufficient numbers of human guinea pigs exist

137. In its submission at 10.4 the applicant makes a valiant attempt to avoid the application of the precautionary principle. The applicant has not provided evidence from a single Australian windfarm where there have been no complaints whatsoever regarding noise, sleep or health. There is no such wind farm; and certainly none comparable to this proposal in terms of the numbers of residents within the distances proposed here.
138. The simple answer to the applicant’s submission is that there are dozens of operating wind farms in Australia, with significant numbers of residents located within distances from turbines similar to what is proposed here. These wind farms provide ample opportunity for independent research to be conducted to either prove (or disprove) the relationship between turbine noise (and air pressure variations) and sleep disturbance and other adverse health effects.
139. There is no need to allow this proposal in order to create a further set of unwilling human guinea pigs to carry out that type of research. All of the applicant’s experts on noise and health agreed that further research is desirable, if not necessary. The Guardians submit that they and the community from which they are drawn do not wish to participate as unwilling guinea pigs in an experiment which can be done at any number of operating wind farms, such as Waterloo in South Australia or Waubra and Macarthur in Victoria.

140. A precautionary approach is also advocated by the NHMRC as suggested by the evidence of Prof Anderson given to the Senate enquiry in March 2011, where he said in relation to the Rapid Review (relied on heavily by the applicant here):³⁴

but I do want to make a point to anybody who is relying on this (Rapid Review). We regard this as a work in progress. We certainly do not believe that this question has been settled. That is why we are keeping it under constant review. That is why we said in our review that we believe authorities must take a precautionary approach to this. That is what we do say in medicine anyhow, but this is very important here because of the very early stage of the scientific literature....

...

As I said in my opening statement, we are very aware that the high-quality scientific literature in this area is very thin. That is why we were at pains to point out that we believe that a precautionary approach should be taken to this, because, as you would understand, the absence of evidence does not mean that there might not be evidence in the future; it is just that, at the stage when the review was done, it was not there. So we have kept an eye on the literature during the period of time, and we are aware of some papers that have since been published.”

The main thing I wanted to say is that, if there are ill effects, that is a very important thing for the NHMRC. We have not done something and walked away, we are keeping it under review and we would expect that as the literature matures and becomes more advanced and there are better studies that the possible ill effects will emerge strongly...

Senator FIELDING - ...you are making some, I think, rightly qualified statements that we have to take a precautionary approach. It seems to me that that precaution may not be being taken because everyone is putting a very large weight on the NHMRC’s rapid review statement and saying that there are no adverse health impacts from living near wind turbines and everyone is just approving them on that basis. That is of huge concern to me.

Prof Anderson - I know that the headline on that public statement says that, but the document does not say that. It did say that there was no published scientific evidence at that stage to positively link the two. That is a very different thing to saying that there are no ill effects and we do not say that there are no ill effects. We definitely do not say it that way....

³⁴ Refer exhibit WF 36.

141. Dr Black disagreed with the NRMRC's suggested need for authorities to take a precautionary approach to the issue of wind turbine noise and adverse health effects. Dr Black's evidence can be safely rejected on this topic.

Non-compliance with NZS 6808:2010 – the Wollert Glen and Waugh properties

142. Mr Steven Cooper gave evidence on behalf of the Guardians and in respect of the Wollert Glen (or Gilmour) approved dwelling and concluded in his statement at paragraphs [73]-[75]:

The dwelling off Ghin Ghin Road belonging to the Gilmore's (permit P306843/12 – GPS coordinates 347857 E and 5892977 N) is inside the 40 dB(A) contour and approximately 875 metres from WT7 ("the Gilmore dwelling").

The turbine noise levels would be clearly audible given the present acoustic environment at both of the new dwellings.

The Gilmore dwelling does not, according to the Sonus noise contour map, appear likely to comply with the New Zealand Standard's A-weighted base noise level target of 40dB(A). If the area is correctly designated a "high amenity" area, the noise levels at that dwelling will exceed the 35dB(A) base criterion by a considerable margin.

143. Mr Cooper went on in paragraphs [77]-[85] to argue that the high amenity criterion should apply to both the Wollert Glen dwelling and the Waugh dwelling, in which event there will be non-compliance with that criterion at both dwellings. He concluded at [84]-[85]:

There will be non-compliance with the 40 dB(A) base criterion noise limit set by the NZ Standard at the Gilmore dwelling, based on the Sonus noise contour map.

With the application of the high amenity criterion and the 35dB(A) night-time base noise criterion there will be non-compliance with that criterion at both the Gilmore dwelling and the Waugh dwelling, based on the Sonus noise contour map.

144. Mr Cooper was not challenged during cross examination about these conclusions. Although, he was challenged about the applicability of the high amenity criteria.

145. There has to be some doubt about the ability of the proposal to comply with either the high amenity criterion at both the Wollert Glen and Waugh dwellings or the 40 dB(A) criterion at the Wollert Glen dwelling.

146. In LG 76, tab 7 appears a noise assessment made by Sonus for a wind farm referred to as Hallett 2 near the town of Mount Bryan in South Australia. The predictions relate to Suzlon S88 turbines which are 2 MW machines with 44m blades. At page 8 Sonus makes predictions for various residences. In relation to 3 of them Sonus predicted turbine noise levels as follows:

House	Wind speed of 6m/s	Maximum level	Distance to nearest turbine
52	37 dB(A)	38 dB(A)	1530m
54	39 dB(A)	41 dB(A)	1189m
57	35 dB(A)	37 dB(A)	1683m

147. The table in Appendix D of the Sonus assessment provides the distances set out above. These predictions can be compared with the predictions made for Wollert Glen. The Wollert Glen home is closer to turbines than any of the residences referred to above. It is less than 960 m from the nearest turbine (Mr Cooper says 875m at [73]). The turbines proposed here are 3 MW machines on 100 m towers with 56m blades.

148. At Hallett 2 Sonus predicted non-compliance with a 40 dB(A) criterion in respect of smaller turbines at a distance of 1189m. Here, Sonus predicts compliance with the same criterion at a distance of less than 960m for considerably larger turbines.

149. In its Hallett 2 predictions, Sonus gives turbine noise levels at wind speeds of 6m/s – refer table above: here relevant to satisfying the high amenity criterion at night time.

150. The Wollert Glen home is closer again than all of those residences. However, Sonus predicted turbine noise levels of 31 dB(A) at a wind speed of 6 m/s, where the high amenity criterion to be met is 35 dB(A) at that wind speed at night. From the table above it can be seen that Sonus predicted turbine noise levels at house 54 (1189 m from the closest turbine) of 39 dB(A) at a wind speed of 6 m/s. This is 8 dB(A) more than at the Wollert Glen dwelling which is less than 900 m from larger turbines.
151. Based on the fact that sound power increases with power output³⁵ it is unlikely that the Sonus prediction of compliance at Wollert Glen is correct; either in terms of the 40 dB(A) limit; or in terms of the high amenity criterion should the Tribunal find that that criterion applies. Mr Cooper's evidence on this topic should be preferred.
152. Non-compliance with the criterion set by the New Zealand standard provides a further reason to refuse this application.

Impact on the landscape and loss of visual amenity

153. As noted above, the Guardians rely upon and support the submissions made by the responsible authority in relation to the impacts on visual amenity and in relation to impacts on native flora and fauna. Accordingly, the submissions that follow are less detailed and comprehensive than those related to noise and the impact on human well-being set out above.
154. The Guardians refer to clause 12.04-2 (Landscapes) and 22.03-4 (Hilltop and Ridgeline Protection) and submit that this proposal is inconsistent with those parts of the plan.

³⁵ Waubra Foundation Book, tab 10, Moller and Pedersen, p3737 - as turbine electrical output increases so does the sound power from any given turbine.

155. Under clause 52.32.5 of the Planning Scheme the Tribunal must consider:
- 155.1 the impact of the development on significant views, including visual corridors and sightlines;
 - 155.2 the impact of the facility on cultural heritage;
 - 155.3 the *Policy and Planning Guidelines for development of wind energy facilities in Victoria* (July 2012).
156. The Guardians submit that the proposal will have an adverse impact on the landscape of the area. There will also be an adverse impact on the visual amenity presently enjoyed by hundreds of residents, comprising the Trawool Valley and Whiteheads Creek communities. These impacts fall not only for consideration within the specific provisions of the plan and policy referred to, but also require assessment as part of the broad concept of human well-being and amenity provided for in section 5.1.1 of the policy; within the concept of well-being, as defined in *Romsey*.
157. Hilltops and ridgelines are seen in the distance from almost any perspective within the Shire. The visual and environmental implications of development along those natural features can destroy the attractiveness and environmental qualities of the area and is discouraged. Clause 22.03-4 includes the following objectives:
- 157.1.1 to protect areas of environmental and visual significance from inappropriate development;
 - 157.1.2 to limit development on prominent ridges and hilltops;
 - 157.1.3 to encourage the protection and revegetation of landscape features as an enhancement;

- 157.1.4 to contribute to the protection of the environmental qualities of hilltops and ridgelines.
158. The Guardians submit that the proposal is contrary to the clear objectives of the planning scheme, as it will detrimentally affect the visual significance of an important landscape feature, the Cherry Tree Range, characterised by its hilltops and ridgelines. Development should not occur on these prominent ridges and hilltops. The plan clearly discourages such development.
159. The National Trust has classified the Trawool Valley as a landscape of “*high scenic quality, geological and cultural interest*”. The National Trust notes that “the scenic qualities of the Trawool Valley combined with its geological and cultural interest contribute to make this a landscape of State significance” – refer to the National Trust documentation submitted by Mr Roser and also that attached to the statement of Ms Fagan.
160. The Guardians rely on the evidence of Mr Czarny (dated January 2013) at p6 that “... *the scenic quality of the landscape will be diminished as a result of the proposal to a degree that it detrimentally affects the integrity of the Trawool Valley as viewed by its residents and visitors*”.
161. The Guardians submit that given the visual significance of the Cherry Tree Range, and the backdrop it provides for the Trawool Valley, this proposal will detrimentally impact on that significance (an integral part of the “amenity of the area”) to a degree which cannot be described as “minimal”. The proposal involves the location of a cluster of 16 large industrial wind turbines (at 160m in height, 30m higher than the top of the arch of the Sydney Harbour Bridge).

162. Given the prominence of the Cherry Tree Range, and the significance of that feature in this particular landscape, the location of 160 m high turbines on its ridges and hilltops is inappropriate.
163. In addition, the Tribunal must consider the impact of the development on significant views including visual corridors and sightlines.
164. The Guardians take issue with the evidence of Mr Moir in relation to impacts on views and the consequent impact on amenity and human well-being.
165. Currently hundreds of residents and numerous visitors have uninterrupted views of what can be fairly described as an iconic landscape: the artists from the Heidelberg school, Stretton, Roberts et al, certainly considered it worth capturing for the benefit of others.
166. The Guardians gave evidence and the lay objectors made submissions on the cultural, historical and social significance of the Cherry Tree Range and the role it plays in the life of the Trawool Valley and Whiteheads Creek communities. All spoke, and many with great passion, about their love of, and connection with, this landscape.
167. It is submitted that the proposal is inconsistent with the plan and the policy because will unreasonably interfere with the wellbeing of such a large number of people in this community by negatively impacting on the social, cultural and environmental elements which form part of this community's well-being.
168. It is submitted that it will also impact negatively on the tourism potential of the Trawool Valley, including the new Rail Trail. A key part of the attractiveness of the Trawool Valley is the backdrop of the Cherry Tree Range. It is this natural attractiveness which has drawn so many residents to live in this community and

has drawn so many visitors and tourists; including Australia's leading landscape artists. This proposal must necessarily have a negative impact on the natural beauty and attractiveness of this landscape.

169. The Guardians again note that Mr Moir's visual assessment failed to account for a significant number of homes in the vicinity of the proposed development site: exhibit LG 59. Mr Moir's evidence failed to consider the impact of visual amenity on the 250 residences which were not included in his assessment. Mr Moir agreed that the impact on visual amenity increases with the number of persons who presently enjoy the visual landscape. Accordingly, Mr Moir has failed to assess the true visual impact of this proposal. Moreover, his report was riddled with errors and inconsistencies pointed out during cross examination. It is submitted that the evidence of Mr Czarny is to be preferred.

Native Fauna: part of the “amenity of the area”

170. The Tribunal must consider the impact of a facility on the natural environment and natural systems (clause 52.32-5). It is also submitted that the broader concept of human well-being includes an environmental element (*Romsey*). From the passion and conviction with which the Guardians' witnesses gave evidence, and from the submissions made by lay objectors, it is evident that the fate of native birds and animals is of deep concern to this community.
171. This proposal threatens to kill large numbers of wedge tailed Eagles and other birds and bats that traverse the Cherry Tree Range. Mr Lane in his statement (p13) estimated that “two to four birds per turbine per year” will be killed by this proposal. An extrapolation results in annual bird deaths in the order of 32 to 64.

172. The Guardians witnesses and lay objectors all spoke of wedge tailed Eagles routinely soaring and hunting over the proposed site; Mr Bell spoke of seeing groups of 20 Eagles at a time. Even with a small resident population of wedge tailed Eagles it is evident that a substantial number of them will be killed annually and, perhaps, in sufficient numbers (based on Mr Lane's estimate) to have a permanent and irreversible impact on the resident population.
173. Mr Lane's 2 bird surveys were carried out over a few days in late summer 2010 and early summer 2012 and, on both occasions, during regional droughts. He did not carry out any survey at Horseshoe Lagoon, presumably because his client instructed him not to. He said that he did not turn his mind to the need to survey the area. His survey maps show that he excluded consideration of the Goulburn River and its adjacent lagoons and billabongs. A narrow survey was, apparently, carried out at the point where the transmission line is proposed to cross the river. However, this was mainly concerned with the brown toadlet and not with waterbirds or birds generally. The bird surveys were carried out between 8am and no later than 4pm. Mr Lane agreed that birds move in the early morning and after sunset, but his surveys were conducted during "bankers hours".
174. It is submitted that the surveys were deliberately designed to avoid the identification of the large numbers and large variety of bird species that congregate around the river its lagoons and billabongs and traverse the Cherry Tree Range during the early morning and evening when birds are most likely to be on the move. Moreover, carrying out surveys during the middle of the day in the summer time would fail to account for the many species that naturally seek shade and shelter to avoid the heat of the day. Mr Lane notes in his statement (page 39) that the conditions were warm to hot.

175. Mr Lane provided incredibly sophisticated calculations said to demonstrate the risk of fatality (or in his opinion the lack of risk) for birds flying across the proposed site. His various assessments and statement were riddled with inconsistencies and errors. One of these inconsistencies concerned his assumption about the size of the turbines on what he referred to as Rotor Swept Area (RSA). In his statement at page 9 he provides a figure of 140 m; which conflicts with the figure of 130 m which appears on page 38 where he details his discussion of his study method. Neither of these assumptions about the size of the turbines are correct. The applicant is seeking to use much larger turbines the tips of which will be 160 m above the ground not the 130 m above the ground assumed by Mr Lane.

176. Mr Lane's argument and analysis about bird behaviour, particularly the suggestion that birds will fly at a constant height above ground and therefore avoid "interaction" with the turbines (a euphemism for colliding with turbine blades with outer tips travelling at over 400 km/h) defies logic and common sense. It is a valiant attempt to avoid the reality that 16 wind turbines with 56 m blades will kill hundreds of birds and bats every year and thousands over the lifetime of this project.

177. Mr Lane's maps (handed up during his evidence) included a map (A84, p24) showing an arc of wetlands to the South East and North West of the proposed site. Consistent with the evidence given by Mr Forbes it is submitted that a large number of waterbirds will fly between these wetlands and traverse the Cherry Tree Range. Mr Lane's assertion that they will take a long route and fly along the river was inconsistent with his own evidence that birds will fly in a straight line. His evidence is inconsistent with that given by the Guardians' witnesses and the lay objectors' submissions and should be rejected on this point.

178. The Guardians submit that given the lack of depth and inadequacies of the surveys carried out by Mr Lane, the Tribunal cannot be satisfied that there will no significant adverse impacts on fauna caused by this development. The failure to adequately address the impact on native birds and bats provides the further reason to refuse the application.

Native vegetation: integral to human wellbeing and the “amenity of the area”

179. As with native flora and fauna, native vegetation falls within the environmental element to be considered in the assessment of the impact on human well-being and amenity (as per Romsey). The Guardians support the responsible authority's submissions in respect of native vegetation loss, particularly as it relates to the destruction of vegetation and habitat for native fauna along Homewood Road.

180. The Guardians have lead evidence from Peter Hill and Jamie Bell that a far greater amount of native vegetation will be lost along Homewood Road than the applicant suggests.

181. Mr Lane gave evidence that his estimates for tree removal (and deemed tree removal) were based on an assumption provided to him by his client that “road upgrades will not be necessary along most of the length of the existing road formation”. Mr Lane had no idea about the transport requirements of the crawler crane essential for the construction of this project. He had no knowledge of the transport requirements for the nacelles and 56 m blades of the turbines proposed. Nowhere in his statement or his other assessments was there a reference to the overhead clearance required to move either the construction equipment or the turbine components. His evidence on this topic was both incomplete and inadequate. The Tribunal is entitled to disregard it.

182. Ms Butcher's statement at [26] is clearly based on instructions given to her by the applicant (she is unlikely to have plucked that statement from the ether). Ms Butcher says that "an upgrade to Homewood Road will be required to provide access to the site." And says that the existing "carriageway", is intended "to be widened up to 6 m where required" and that "The road will be constructed in an 'all-weather' surface capable of carrying heavy vehicles - most likely crushed rock - as has been the case for other with wind farms". Ms Butcher was prompted by Mr Power to say in her evidence that this statement was incorrect. No explanation was proffered as to how it came to be included in her statement. The applicant has, through Ms Butcher's written statement, inadvertently placed its true intention before the Tribunal.

183. What appears at [26] of Ms Butcher's statement is entirely consistent with the evidence given by Jamie Bell, a Project Supervisor with experience in major construction of infrastructure projects. Mr Bell gave evidence that Homewood Road will need to be both deepened and widened with an appropriate road base to carry the crawler crane which will weigh between 650-1200 tonnes. Mr Bell also gave evidence that, at a minimum, there will need to be substantial vegetation clearance and lopping to allow for a clearance of at least 7 m in width and at least 8 m in height to allow the crawler crane to be transported to and from the site. His evidence was that more than 200 substantial eucalypts would need to be removed to provide heavy vehicle access to the site. Mr Bell said that all the roadside vegetation from the corner of Kobbboyn Road and Homewood Road would need to be cleared for a distance of at least 700 m.

184. Mr Lane was unable to reject Mr Bell's evidence (bearing in mind he has no experience as a construction engineer and was simply relying upon what his client

told him). Mr Bell's evidence finds considerable support in Ms Butcher's statement at paragraph [26] which discloses the applicant's actual intention in this case.

185. The Guardians refer to the expert evidence filed by the Council by Aaron Organ of Ecology & Heritage Partners (January 2013). They note his views that further surveys are required for various species. In particular the Guardians note that he considers that further surveys including identification of dens of the Brushtailed Phascogale (*Phascogale tapoatata*) are required. The Guardians note that residents recently found two dead Phascogales along the northern part of Homewood Road in the last month (LG9 and 9A). They are a nocturnal, arboreal, carnivorous marsupial. This shows that this species is in that vicinity and the Guardians are concerned about the impact of the development and particularly the impact of substantial vegetation clearance along Homewood Road on their habitat.
186. The policy provides that consideration needs to be given to whether species or communities are protected under the EPBC Act or the Flora & Fauna Guarantee Act and the potential loss of their habitat (section 5.1.4). If a proposal is likely to have significant impacts on listed species the Tribunal should consider whether the applicant has provided appropriate survey work. It is noted that the Phascogale is listed under the Flora & Fauna Guarantee Act as a threatened species. This species is in decline in Victoria. Therefore, in accordance with Mr Organ's recommendations, further surveys of this species and its habitat are urgently required.
187. The inadequacies of the material presented on the removal of native vegetation from Homewood Rd. and the extent of the removal in fact required, provide further grounds for the Tribunal to refuse this application.

Fire as a management issue & as an issue for human wellbeing and amenity

188. The Guardians are concerned about the increase in the fire risk in the area caused by this project, as well as the impact on the ability to use aerial fire-fighting techniques which will result from this proposal.
189. Any increase in fire risk necessarily brings with it an impact on human well-being. This community narrowly escaped the Black Saturday bushfires in 2009 and is keenly aware of what an out of control bushfire can do. Any potential increase in fire risk, or diminution of the communities' ability to fight fire, brings with it an increase in anxiety, which is a social impact detrimental to human well-being.
190. Ms Butcher at [106] of her statement claims that the turbine layout will address the CFA's Emergency Management Guidelines for Wind farms. She says that in most instances the turbine layout meets the CFA's recommended separation distance of 300 m (although noting the change in layout increases the number of turbines unable to meet the recommended separation distance). The aviation assessment prepared by Aurecon for the applicant states:³⁶

WTGs (Wind Turbine Generators) are proposed to be located greater than 300 m apart, in accordance with the recommendations of the CFA Guidelines. However, due to topographic and wind resource constraints some WTGs are located less than 300 m apart - approximately 225 m as a minimum between WTG 13 and the WTG 14. This would not be consistent with the guidelines which advise a separation of 300 m. It is recommended that the Proponent should carry out further consultations with the CFA.

191. From the map annexed to the statement of Dr Adam McCarthy it is evident that 9 turbines (of 16 proposed) are all located within 300 m of each other and the majority of those are less than 250 m apart. The CFA has made a specific recommendation which the applicant inexplicably chooses to ignore.

³⁶ Vol 5, tab 116, 9.

192. The manner in which the applicant has failed to address the CFA guidelines has only added to community suspicion of this applicant and has lead to an increase in anxiety over fire risk and fire control in this community.
193. The applicant's failure or refusal to comply with the CFA Guidelines provides further reason to refuse this application.

Conclusion: this site is not an appropriate location for a wind energy facility

194. For the reasons given above this proposal should be refused.
195. The proposal involves the largest land-based wind turbines ever used in Australia and places them in an area of significant landscape value.
196. The cost to this community in terms of the impact on its well-being, including negative social, cultural, economic and environmental impacts, far outweighs any benefit to this community from this proposal. There are simply far too many homes too close to this proposal.
197. The claimed "bigger picture" benefits are not supported by any credible evidence, but are undermined by evidence presented by the Guardians.
198. The manner in which the applicant has prepared the material said to support its proposal can be described as "sloppy", at best. Mr Lane described being under "time pressure", perhaps a reason for the errors and inadequacies in his work. The applicant's experts relied upon incorrect information provided by the applicant and in turn relied upon the same incorrect information to rely on each other (eg Ms Butcher's claim that the area is "sparsely populated" based on Mr Moir's failure to identify a further 250 homes within 10 km of the site).
199. The concept of human well-being goes well beyond the absence of adverse physical effects and here has to be considered under the policy.

200. The impact from turbine noise (or air pressure variations) on this communities' ability to sleep and otherwise enjoy their homes will not be "minimal".
201. Section 5.1 of the policy requires the Tribunal to "balance environmental, social and economic matters in favour of net community benefit and sustainable development."
202. In accordance with that task, taking into account all of the relevant provisions of the plan and the policy and the evidence before the Tribunal, it is submitted that the balance favours preserving this community by rejecting this application.

Postscript: the setback prohibition still operative

203. In respect of the approved Wollert Glen Pty Ltd dwelling and the approved Waugh dwelling it is submitted that the prohibition on the "use" of turbines set out in clause 52.32-2 operates prospectively. 52.32-2 speaks in terms of requiring a permit "to use and develop land for a Wind energy facility" and goes on to say:

The use and development of land for a Wind energy facility is prohibited at a location listed in the table to this clause.

204. The table includes the following statement identifying locations which prohibit the use and development of land for a Wind energy facility, namely:

On land where any turbine that forms part of the facility is located within two kilometres of an existing dwelling.

205. The highlighted term "is located" is clearly not dealing with the future tense (it would have read "is to be located", for example) and is either present or past tense. Read literally, what appears in the table suggests that the prohibition applies to any turbine (presently in existence) which is within 2 kilometres of an existing dwelling: meaning "existing at the time of the "use" of that turbine".

206. In 52.32-2 it is clear that the prohibition applies to the “use” of land for a Wind energy facility, which would capture the present as well as the future operation of that facility.
207. On that construction, a turbine may well be “developed” (ie, constructed) within 2km of an existing dwelling but its “use” as part of a Wind energy facility is subsequently prohibited.
208. It is submitted that the literal meaning of the clause is that a windfarm developer may be permitted to construct (ie develop) a wind turbine within the prohibited distance, but not to operate it (ie use it). There is evidence before the Tribunal that both the Wollert Glen dwelling and the Waugh dwelling, presently under construction with an intention to complete construction; in the case of Mr Gilmour to use the dwelling as a weekend retreat; in the case of the Waughs to use it as a principal place of residence.
209. At point in time that these dwellings come into existence in the future it is submitted that the prohibition will operate to prevent the use of any turbines located within 2 km of either dwelling.
210. It is submitted the appropriate course is for a condition to that effect to be included in the event that this proposal was granted.

**PETER G QUINN
Murray Chambers**

Date: 13 March 2014