

BOARD OF INQUIRY

**Turitea Wind
Farm Proposal**

**FINAL REPORT
AND DECISION OF THE
BOARD OF INQUIRY INTO THE
TURITEA WIND FARM
PROPOSAL**

Volume 1

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September 2011

BOARD OF INQUIRY

In the Matter of the Resource Management Act 1991

And

**In the matter of a Board of Inquiry appointed under s146 of the
Resource Management Act 1991 to consider an
application by MIGHTY RIVER POWER LIMITED
for resource consents to construct, operate, and
maintain a wind farm at Turitea**

THE BOARD OF INQUIRY

Environment Judge Shonagh Kenderdine (Chairperson)

Environment Commissioner David Bunting

Mr John Hudson (Member)

Mr Richard Heerdegen (Member)

Mr Chris Shenton (Member)

**HEARINGS at PALMERSTON NORTH on 6–7, 27–31 July 2009,
6–7, 11–14, 24–28, 31 August 2009, 1–4 September 2009,
12–14 October 2009, 15–19, 22–24 and 29–30 March 2010**

APPEARANCES as listed in Appendix 2

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Foreword

The Turitea wind farm proposal was called in by the Minister for the Environment in December 2008. Following the appointment of the Board of Inquiry and the preparation and exchange of evidence by the parties, the hearing commenced in Palmerston North on 6 July 2009. At Mighty River Power's (MRP's) request, the hearing was adjourned for five months on 14 October 2009 to allow MRP to reconsider its design of the wind farm layout. Evidence on the redesign was circulated by MRP to all other parties in February 2010 following which the hearing was reconvened on 15 March 2010. This second stage of the hearing concluded on 30 March 2010.

The Draft Report was released on 11 February 2011 with comments on this report being extended to 60 working days at the request of MRP. All parties were also given the opportunity to make any final comments on a number of matters raised in MRP's comments on the Draft Report, in particular, on the National Policy Statement on Renewable Electricity Generation and MRP's request to reinstate and/or add up to 12 turbines over and above the number decided on by the Board in its Draft Report decision. All of this resulted in an extended period between the time of the release of the Draft Report and the publication of this Final Report.

During the course of the hearing, the Board heard evidence from a great number of experts, and oral submissions and presentations from numerous submitters. The inquiry involved the consideration of a number of complex and wide-ranging issues. Of considerable concern was the need to keep the number of parties and submitters (of whom there were some 700) fully informed of the legal and practical processes involved in an inquiry like this, and to ensure those who wished to appear had a fair hearing.

While the documentation became all consuming, all parties were kept up to date with the provision of daily transcripts of the record of proceedings. Nevertheless, with so many submitters who wished to be heard in full-time employment, we can only commend the way they organised themselves and the efforts they went to, to provide us with relevant information.

We acknowledge the quality of the submissions and the extensive literature supplied by the submitters as background to their particular concerns especially to do with noise and environmental set-backs.

As the hearing progressed, MRP received a large number of requests from the Board for additional information. We wish to acknowledge to the company the consistently high standard and very timely responses to all of these requests.

The Board also wishes to acknowledge the time and commitment of many submitters and other parties who provided comments on the matters raised by MRP in its comments on the Draft Report.

Throughout the whole inquiry process, all the parties and the Board received a consistently high standard of support services from the Project Co-ordinator and her team. This was not an easy task, particularly during the hearing, where it involved extended hours of work to ensure smooth progress of witnesses and the collation of evidence on a daily basis.

We wish to thank all counsel for the parties, and the representatives of Tararua-Aokautere Guardians Incorporated and Friends of Turitea Reserve Incorporated, for their generous consideration and assistance throughout.

Decision

The Board has approved 60 turbines for the Turitea wind farm each with a capacity of up to 3MW, these being:

- Group C: WT67–WT71, WT96 (six turbines)**
- Group D: WT1–WT9, WT11–WT14, WT97–WT98, WT30–WT33 (19 turbines)**
- Group E: WT10, WT38, WT99–WT107, WT109 (12 turbines)**
- Group G: WT34–WT37, WT44–WT48, WT110 (10 turbines)**
- Group F: WT115–WT118 (four turbines)**
- Group H: WT52, WT111–WT114, WT119–WT121 (eight turbines)**
- Group K: WT54 (one turbine)**

all as shown on the layout plan attached as Appendix 8 to this report and all subject to the approved conditions of consent also attached to this report.

Executive Summary

Introduction

The proposed Turitea wind farm is located along the ridgelines of the northern Tararua Ranges in the Turitea Reserve and on surrounding farmland, on the outskirts of Palmerston North. Within the Reserve, the land predominantly supports native vegetation with the farmland generally being in pasture for sheep and cattle grazing. Along its south and south-eastern boundaries the Reserve abuts Hardings Park and the Tararua Forest Park. The Reserve incorporates the catchment and two large reservoirs, which provide most of the water for Palmerston North City.

A large number of rural residential properties are located on the slopes below the wind farm with the residents of these properties having major concerns primarily over visual and noise effects.

The wind farm proposal was called in by the Minister for the Environment in December 2008. Following the appointment of the Board of Inquiry and the preparation and exchange of evidence by the parties, the hearing commenced in Palmerston North on 6 July 2009. At Mighty River Power's (MRP's) request, the hearing was adjourned for five months on 14 October 2009 to allow MRP to reconsider its design of the wind farm layout. Evidence on the redesign was circulated by MRP to all other parties in February 2010 following which the hearing was reconvened on 15 March 2010 to hear this evidence. This second stage of the hearing concluded on 30 March 2010, some 15 months following the date of the call in.

The Draft Report was released on 11 February 2011, with the s148(4) RMA specified 20 working day period for the Board's receipt of comments on this report being extended to 60 working days (to 12 May 2011) at the request of MRP.

The Board determined that all parties should be given the opportunity to make any final comments (by 20 June 2011) on a number of matters raised in MRP's comments on the Draft Report, in particular, on the National Policy Statement on Renewable Electricity Generation (NPSREG), which had become operative on 13 May 2011 and MRP's request to reinstate and/or add up to 12 turbines over and above the number decided on by the Board in its Draft Report decision. All of this resulted in an extended period between the time of the release of the Draft Report and the publication of this Final Report.

Parties to the inquiry included the applicant (MRP), two councils (Palmerston North District Council (PNCC) and Horizons Regional Council), (the third council, Tararua District Council, did not participate in the inquiry), the Department of Conservation, four property owners on whose land turbines were proposed (Ngawai Farm Limited, Joseph Poff, Maurice and Dorothy Alley and John and Kathryn Love), two community groups (Tararua-Aokautere Guardians Incorporated and the Friends of Turitea Reserve Incorporated), two mandated iwi authorities – Tanenuiarangi Manawatu Incorporated (TMI) and Rangitane

o Tamaki nui a Rua, Te Rangimarie Marae Trustees, a local marae (Huatau Marae), two interest groups (the Energy Efficiency and Conservation Authority and the New Zealand Wind Energy Association), and 702 private submitters.

The proposal as notified was for 122 three-bladed turbines with 80-metre towers, a rotor diameter of some 90 metres, and a maximum height with a rotor blade vertical of about 125 metres. MRP's redesign changed this to a maximum of 104 – 2.3MW turbines or 96 – 3MW turbines with an installed capacity of up to 288MW.

Turitea's Weather

The wind farm is sited in an area with an outstanding wind resource with the potential to operate with a very high capacity factor of up to 45%. It is also located in an area of high rainfall. There was general agreement among the experts on the rainfall estimates, although the Board was left in some doubt as to whether the worst-case landslip scenario should have been based on a two-year average recurrence event (as adopted by Mr Levy) or the more severe 10-year event (adopted by Dr Salinger). As it turned out, the effects of the landslips modelled for each event were shown to be very similar. The Board commends the inclusion of a condition of consent restricting construction in nominated locations of the wind farm during winter, when rainfall will be at its worst.

Any effects from climate change will most likely be limited to a small increase in wind speeds later in the life of the wind farm and this will be factored into the design of the turbines. In addition, the effects from the natural variability of weather patterns from such influences as El Niño and La Niña should be minimal and readily provided for in the design of the wind farm's infrastructure.

The New Zealand Electricity Market, Project Economics and Alternatives

Renewable energy is a key plank in New Zealand's priority policy for reducing greenhouse gas emissions, and the development of the Turitea wind farm is well aligned with this policy. It is not surprising that MRP is seeking to maximise the size of the wind farm given its very high-quality wind resource and its proximity to both the national grid and the centre(s) of electricity demand.

The Board accepts the advice of MRP's experts that the cost of the wind farm is primarily an issue for MRP, with the cost to electricity consumers being protected through the electricity market pricing structure for the purchase of wind-generated power.

The Board concluded that endeavouring to undertake a comprehensive economic analysis of all of the potential benefits and disbenefits of the wind farm would be largely a theoretical exercise with individual economic valuations, by necessity, requiring a range of variables to be considered to cover uncertainties. When aggregated, this range would then result in an even wider range of possible outcomes which would lack any robustness in assisting with any meaningful

decision making. Further, the Board accepts Dr Layton's¹ view that an economic value is implicit in all consent decisions including the measures taken to avoid, remedy or mitigate effects. If the wind farm is built to operate within specified limits to control these effects, then the economic value can be regarded as having been internalised within the design and operational costs of the wind farm with no unaccounted external effects. The Board's role under the Resource Management Act 1991 (RMA) is to decide on the consent application based on its assessment as to whether the project's benefits outweigh its adverse environmental effects. In this context, the Board has undertaken detailed evaluations of all of the potential environmental disbenefits including whether each can be avoided, mitigated or remedied to an acceptable degree. These evaluations are discussed in detail in the individual chapters of the report.

We also agree with Dr Layton that the Board is not a modern-day electricity planning committee deciding from all possible options what generation capacity is necessary; what kind of generation plants should be built; when a particular plant should be built (other than by setting an upper limit on the term of the consent); and that our responsibilities do not include reaching a conclusion by comparing the proposal before it with some other hypothetical competing proposal.

In its comments on the Draft Report, MRP contended that the NPSREG requires decision makers to ensure, as far as possible, that renewable energy projects for which they grant consent will be viable. We do not agree that the NPSREG elevates questions of economic viability in that way. There is no directive in the policy for a decision maker to have particular regard to economic viability or the deliberate promotion of that issue, least of all as a matter that might be accorded greater weight than landscape or other amenity values. Our awareness of viability issues was reflected in our Draft Report, where the location of every turbine was addressed individually.

In Chapter 19, we set out the findings of our overall Part 2 RMA evaluation of the project's benefits and disbenefits. These identify that changes in the economics of the project are a matter properly for MRP, not the Board, which has much wider considerations to evaluate. The 'cost' of the turbines that we have deleted was such as to require their removal, regardless of the viability of the remaining turbines as a project for MRP.

Terrestrial Ecology of Reserve

The access roads for the wind farm will need to be designed to accommodate large construction cranes and the transport of very long turbine components. Other critical infrastructure components include the need for detailed consideration of the interface between the geology of the site, its stability, and the control of sedimentation discharge from the planned civil engineering works, as well as the design and construction of the turbine foundations. For each of these components the Board has concluded that MRP's proposed approach is based on well-proven technologies and methodologies.

¹ Witness for MRP on economic benefits.

It is inevitable that the construction of a wind farm in the Turitea Reserve will result in negative environmental effects including the need for clearances of tracts of indigenous vegetation.

The Turitea Reserve represents 90% of the ecology of Palmerston North City. The Board has identified that the critical areas for clearances of indigenous vegetation are Game Ridge, following our reconsideration of its ecology in preparing this final report, the boundary of the water catchment access road on Back Ridge (South), the individual access roads and the turbines on the spurs off Back Ridge (South) and along the southern boundary with Hardings Park and the Tararua Forest Park.

Mr Shaw, for MRP, does not consider the range of species present on Game Ridge as ranking of national significance, as the plant species (possibly falling within development areas associated with the wind farm) are not classified as threatened, except *Brachyglottis kirkii* ('At Risk') and from that species cuttings for replanting have already been taken. It is his view that the range of species present is certainly 'of local and possible regional significance' as it 'supports local and regionally threatened species (also some habitats, such as the tawa-dominant forest)'. However, it is the Board's view that legislation (namely s6(c) RMA) does not require areas of significant indigenous vegetation to be divided up into hierarchies of significance – local, regional or national. 'The matter of national importance' is the 'area of significant indigenous vegetation' irrespective of whether it falls within the city of Palmerston North, the Manawatu District, or the rohe of Rangitane. Once an area, as here, has been identified as containing significant indigenous vegetation then the fact of that identification triggers a need for recognition and protection as a matter of national importance – not of local or regional importance. How far that protection and recognition goes, however, is a matter of degree in any one case.

MRP's original (and redesign) turbine layout on Game Ridge portrays the break up and fragmentation of what its own expert witness identifies is an area of significant indigenous vegetation which the legislation requires to be recognised and provided for as a matter of national importance. The expansive scatter of very large turbines and their large and relatively shallow concrete bases throughout the area, in conjunction with the access roads to the turbines, discount this significance, let alone fail to protect it.

The Board has determined from the evidence of particularly Mr William Shaw² and Dr Blaschke³ that as Game Ridge forms a central place in the area of 'significant indigenous vegetation' (the whole being the total sum of parts such as the ridges in question), consent should be declined for the Game Ridge turbines WT57–WT66.

The vegetation around turbines WT39–WT43 on Back Ridge (South) has been assessed to have 'high' ecological value, and the clearances of this vegetation for construction would have a 'high' degree of impact with effects that are 'more than

² Witness for MRP on ecology.

³ Witness for PNCC on ecology.

minor'. Extended individual roads are also required for access to each of the turbine platforms.

Ms Gabites⁴ notes from her site visit that, for turbines WT39 and WT40, within just a few metres from the water catchment road, the species *Raukaua edgerleyi* (only recently taken off the threatened species list) was plentiful, and at both areas the canopy was 5 to 6 metres. It is her view that if this is typical of the intrusions into the more sheltered eastern aspect sites, then the adverse effects of clearances for turbines WT39–WT43 will be significant. She also pointed out that other canopy species present such as *tawa* and *miro* are, like *rauaua*, mid-to-late successional stage species. In her opinion, to replace such losses through mitigation planting packages will take at least 30 to 40 years.

Having taken account of Mr Shaws, Ms Gabites and Dr Rapson's assessments, as well as the extended areas of vegetation clearances required for access and construction, the Board has determined that consent for the Back Ridge (South) turbines WT39–WT43 should be declined.

In our consideration of MRP's Draft Report request to reinstate WT15–WT20, we revisited our earlier analysis of the ecological evidence and findings for these six turbines. As a result, we have modified our Draft Report finding to include ecological reasons for the deletion of these turbines. All of the turbines along Hardings Park Ridge are in an ecological continuum between Hardings Park, the Tararua Forest Park and the Turitea Reserve and considered of significance under s6(c) RMA to be protected. The ecological effects of the clearances required for their construction are very similar to those applying to Game Ridge. Again, as for Game Ridge, with reference to s6(c) RMA, once an area has been identified as containing significant indigenous vegetation then the fact of that identification triggers a need for recognition and protection as a matter of national importance.

There is, of course, a key distinction between Game Ridge and Hardings Park Ridge and that is, while Game Ridge is currently undisturbed, the integrity of Hardings Park Ridge has already been broken by the water catchment access road. MRP's proposal is for this road to be widened over most of its length as well as being realigned over two lengths totalling some 900 metres adjacent to turbines WT26 and WT33 to provide access for the construction of the turbines both along Hardings Park Ridge and beyond.

The Board was left in something of a quandary on consistency between the vegetation clearances required for the Game Ridge turbines and the Hardings Park Ridge turbines, road realignments and road widening. In its RMA Part 2 analysis, set out in Chapter 19 of the Draft Report (and reaffirmed in this Final Report), the Board decided that the potential for the generation of up to 69MW of electricity by turbines along and beyond Hardings Park Ridge and a number of environmental offsets marginally outweighed the negative effects of the vegetation clearances.

Notwithstanding, as set out in its Draft Report, the Board decided that turbines WT44–WT46 must be relocated closer to the water catchment access road to limit

⁴ Witness for TAG on ecology.

the overall extent of the vegetation clearances required for the construction of the access roads for these turbines. Secondly, MRP was required to rehabilitate and revegetate those sections of the existing water catchment access road which will become redundant once the two new realignments have been put in place.

In its comments on the Draft Report, MRP advised that it was not possible to move the Hardings Park Ridge turbines WT44–WT46 in isolation and that, instead, it proposed that the locations of the turbine zones for WT35–WT37, WT44 and WT46 should all be slightly modified to accommodate the relocation of WT44 and WT46 closer to the access road. In this same area, the Board also acknowledges the request from Friends of Turitea Reserve Incorporated (FOTR), in its comments on the Draft Report, for all of these turbines to be removed. However, in the final analysis, the Board has decided that these turbines can remain in the relocations proposed by MRP as these satisfy our concerns over the quantum of vegetation clearances required on Hardings Park Ridge. Our reasons for retaining these turbines are set out in our RMA Part 2 findings.

The Board acknowledges that, following its request in the Draft Report, MRP has reduced the width of the water catchment access road from 10 metres to 7.5 metres with regular passing bays, with a consequent reduction in the areas of vegetation clearances required for the road widening.

The Board's decisions on turbine deletions have resulted in a major reduction in the extent of vegetation clearances required in the reserve. As a consequence, in its comments on the Draft Report, MRP proposed reduced levels of offsetting rehabilitation/revegetation in Browns Flat. The Board acknowledges that these reduced levels of rehabilitation/revegetation are consistent with the amount of vegetation to be cleared. These are set out in Conditions 33 to 39 of Schedule 2 of the agreed Resource Consent Conditions.

Overall, from the Board's consideration of the ecology of the Reserve, it has determined to decline turbines WT57–WT66 on Game Ridge, turbines WT39–WT43 and WT15–WT20 on Back Ridge (South) and, for Hardings Park Ridge, the retention of WT35–WT37 and WT44–WT46 in the revised locations advised by MRP in its comments on the Draft Report.

The Board also confirms that the eco-park proposal put forward by MRP should be put to one side in its consideration of the wind farm proposal.

Palmerston North City Water Supply

The Turitea Reserve is the catchment which provides much of the water for Palmerston North City, with its population of around 68,000. Specific concerns surrounding construction in the reserve include the potential contamination of the reservoirs from a number of sources including sediment runoff, oil and fuel leakages from construction machinery, the wind turbines and the substations, nutrients from disturbed vegetation, wash down water from concrete batching plants and debris runoff should there be a fire.

The Board was provided with a detailed breakdown of how MRP intends to manage and control the risk of contaminants from each of these sources. The

Board accepts that the risks are low and well understood, that MRP's proposed environmental management techniques and plans are robust and aligned to industry best practice, and that they should achieve an acceptable level of protection for the water supply catchment. This includes the potential effects from a 10-year return period landslip on the reservoir catchments and the water treatment plant. For this, we have concluded that the contingency measures which are in place to respond to such an event, allied with an appropriate water monitoring plan, should provide adequate safeguards for the uninterrupted operation of the PNCC reservoir, water treatment plant and water supply system.

At the time of issuing its Draft Report, the Board had been unable to identify details of the proposed water quality monitoring programme in the 28 March 2010 version of the Resource Consent Conditions. MRP was therefore requested to provide details of this programme. In its comments on the Draft Report, MRP drew the Board's attention to the linked provisions for the water quality monitoring contained in the conditions of consent, the water quality monitoring programme and the construction environmental management plan. This response addressed the Board's concern on this matter.

In its Draft Report, the Board also requested MRP's response on aspects of the aquatic ecology monitoring proposed by Dr Joy for both the streams outside of the Turitea catchment as well as for the Upper Turitea Stream and the water reservoirs. In its comments on the Draft Report, MRP proposed a number of amendments to the draft conditions of consent which addressed the Board's concerns on this aquatic ecology monitoring.

Disposal of Surplus Soil

For the redesigned wind farm, there would be some 1 million cubic metres of surplus soil to be disposed. Inevitably, there will have been a major reduction in this volume following the Board's decision to decline a number of turbines from MRP's redesign.

All of the surplus soil will be disposed of outside of the Reserve but within catchments of a number of ecologically sensitive streams which drain to the Manawatu River. Expert evidence was provided on the ecological values and sensitivity rankings of the upper and lower reaches of each of these streams with concern expressed over the negative effects that would result for aquatic life if significant sediment escaped into the streams, particularly those assessed as being highly ecologically sensitive.

In the final analysis, MRP advised that, for the redesign, the number of disposal sites would be limited to eight, each highly engineered and with its own sedimentation pond. All of the sites would be located in the less sensitive catchments or, for the more sensitive catchments, at least 25 metres from any permanent water course. A precautionary approach was agreed to allow for flocculation to be introduced on a site-specific basis if soil testing found this to be necessary. Apart from some aspects of the stream monitoring proposed by Dr Joy, which MRP have now addressed, all of the measures agreed among the experts for the management and control of the disposal of surplus soil have been carried through to the approved Resource Consent Conditions.

On the basis that these measures are fully implemented, we are satisfied that there should be less than minor effects on the ecology of the catchments from the disposal of surplus soil from the construction of the wind farm.

Avian Ecology

Key concerns surrounding the effects of the wind farm on avifauna include the potential for mortality or injury resulting from birds colliding with the turbines and other structures, the potential for turbine barrier effects to force birds to alter their flight lines, the potential for the displacement of birds, and the need for a well considered bird monitoring programme.

We have concluded that the risk of blade strike for named species does not appear to be severe. Birds likely to be at risk (such as magpies) are predators on New Zealand's native species and removing them will in fact benefit the local population.

Turitea is not in the path of a large number of migrating birds. In addition, many of the turbines which had been identified as being obstructions to key flight paths, (such as those along the boundary with the Tararua Forest Park), have been removed following MRP's redesign and as a result of the Board's own evaluation.

The one raptor which is critically endangered is the New Zealand falcon and it, unlike its international relatives, is very agile.

There are gaps in the knowledge about the seasonal movements of some birds in the Turitea Reserve, the habits of two of its rare species and whether this bird life can be sustainably managed in the presence of the wind farm. The answer to this will come from the comprehensive bird monitoring programme provided for in the approved Resource Consent Conditions and, from this, the response of MRP to the findings of this programme in the context of the layout and operation of the wind farm.

Traffic Issues

The traffic impacts from the proposed wind farm have been considered under three headings, the transport of the turbine components to the wind farm site, the suitability of the proposed northern access off the Pahiatua Track, and the suitability of the proposed southern access from Kahuterawa Road and Greens Road.

The movement of over-dimension and overweight loads over a roading network is quite common and follows well-established procedures under which permits are sought from the New Zealand Transport Agency and/or the relevant road controlling authorities. There is no obvious impediment to such permits being granted for the transport of the turbine components for the wind farm although ultimately that will be for the relevant roading authority to decide.

The Board accepts that the transport of turbine components and construction plant, labour and materials should be able to be safely accommodated at the proposed new permanent access from the Pahiatua Track onto South Range Road

(and if necessary through the proposed second and temporary access on the eastern side of the summit).

Conversely, we accept that if the wind farm is to proceed then some construction traffic must use the Kahuterawa Road/Greens Road access, although at the time we issued our Draft Report there remained considerable concern about the safety of this access under the traffic conditions proposed. In particular, we considered that the residents of Kahuterawa Road and Greens Road needed to be given a much higher degree of certainty on daily maximum truck movements and the period over which these truck movements would occur. We noted that agreements on these matters, which were recorded in the Joint Statement of the Traffic Experts dated 16 July 2009, had not been carried through to the Resource Consent Conditions.

In our Draft Report, we therefore requested MRP to develop, in consultation with PNCC and the local residents, for the Board's approval, a revised schedule of restrictions for the use of Kahuterawa Road and Greens Road by construction traffic. We were most disappointed to learn from comments received on the Draft Report that our requested MRP/PNCC/local resident meeting did not take place until near to the end of the Draft Report comments period, that PNCC chose not to attend, and that as a result the meeting did not move much beyond the expression of resident concerns at what they saw as being only a perfunctory attempt by MRP (and PNCC) for any meaningful consultation on the traffic conditions.

Despite this, having taken account of all comments received on the Draft Report, the Board requested MRP to make a number of amendments to further tighten up the 11 May 2011 traffic conditions. These were to include a provision for a number of options for construction access from Kahuterawa Road and Greens Road to respond to MRP's indication of the possible staging of the wind farm construction and, in particular, the development of the northern turbines ahead of the development of the southern turbines. If the northern turbines are constructed as a first stage, then all construction access is to be from the Pahiatua Track with access from Kahuterawa Road and Greens Road to be limited to the construction of the internal transmission line and the Browns Flat substation (if MRP includes these in this stage). Truck access from Kahuterawa Road and Greens Road will also be allowed for emergencies at any time but access for site security staff, for health and safety or for environmental monitoring is to be restricted to light vehicles only. In addition, for the construction of the southern turbines, truck and light vehicle access from Kahuterawa Road and Greens Road is to be limited to the maximum number of vehicle movements specified in the table at Condition 67 of Schedule 3 of the approved Resource Consent Conditions, noting that all light vehicle access is to be restricted to a maximum of 60 movements per day.

These requested amendments, which are itemised in detail at paragraph 7 of Chapter 20, have all been incorporated in the approved Resource Consent Conditions attached to this Final Report.

Noise

The Board has accepted that the wind farm can be constructed in compliance with NZS6803: Acoustics – Construction Noise. The Board has also accepted the

conditions on Acoustic Matters – Construction Noise contained in the MRP 28 March 2010 Resource Consent Conditions.

On 1 March 2010, just prior to the commencement of the resumed hearing, the new version of the New Zealand Standard Acoustics – Wind Farm Noise, NZS6808:2010 was released. This has been accepted as the standard which should apply for *Turitea*.

In considering the operational noise of the wind farm, the Board has been guided by the Foreword to NZS6808:2010 which states:

- wind farm sound may be audible at times at noise sensitive locations, and this Standard does not set limits that provide absolute protection for residents from audible wind farm noise.

The Standard also states at Section 1.2:

- the noise limits in the Standard provide a reasonable rather than an absolute level of protection of health and amenity.

Mr Lloyd⁵ also made the point that:

- the purpose of NZS6808 is to protect amenity to the degree when a great majority of people are not annoyed. But ‘it will allow for a small percentage of people [to be] more sensitive to noise. Some annoyance will remain but the aim is, on the Bellcurve, to pick up in 80% or 90% of the population and ensure they are not severely annoyed’.

While the Board acknowledges that it is not bound by what NZS6808:2010 (or Mr Lloyd) say, the point remains that different individuals have different noise sensitivities. Irrespective of the noise conditions which may be imposed at *Turitea*, noise from the wind farm will be audible to varying degrees in the surrounding environs.

We also acknowledge Mr Lloyd’s description of the special nature of the location of the *Turitea*:

- the location is next to the currently quiet Tararua Ranges and the majority of surrounding areas are remote from significant roads or significant industrial activity;
- people come to such areas to escape from the close confines of residential or urban living; these people appreciate the aural amenity that is generally the quietness and peacefulness of the area (given that rural noise can be high from time to time);
- wind farm noise is different from all other noisy activities in that it is generated over a wide area and spreads over a wide area of the surroundings – it is difficult to escape from.

Creating an environment where wind farm noise will be clearly noticeable at times of quiet background sound levels is not an option the Board condones,

⁵ The noise expert for PNCC.

especially where large numbers of residents are affected. It is the Board's view that energy operations in New Zealand will have to learn not to place wind farms so close to residential communities if they are not prepared to accept constraints on noise limits under such conditions.

Nevertheless, the Board did not go as far as accepting Dr Thorne's⁶ and Professor Dickinson's⁷ proposed primary and secondary noise limits as well as their proposed minimum setbacks, instead preferring the evidence of the other experts on these matters.

The 'Acoustic Matters – 23 March 2010' conditions agreed by the experts (except for Dr Thorne) contained specific provisions for independent noise testing for special audible characteristics (SAC) at the manufacturer's plant as well as progressive field testing as the turbines are installed. This field testing is structured to identify and rectify any SAC (if a SAC should occur) soon after the installation of individual or groups of turbines, as opposed to delaying testing until the whole wind farm has been completed. The Board commends this approach.

In our Draft Report, we noted that not all of the 'Acoustic Matters – 23 March 2010' conditions had been taken forward to the MRP 28 March 2010 Resource Consent Conditions document – in particular the following condition:

- the experts' agreed conditions require that reduced noise limits should apply between the hours of 10:00pm to 7:00am for locations with low background sound levels as would apply as if these were classified as high amenity areas under C5.3.1 of NZS6808.

In her closing legal submission, counsel for MRP advised that MRP disagreed with this proposed condition unless the locations referred to were classified as high amenity areas defined in the relevant district plan. Whilst the Board acknowledged that there are no high amenity areas defined in the current PNCC District Plan (or the Tararua District Plan), it nevertheless supported the findings of the experts that a secondary noise limit should apply at times of low background sound levels.

In the Draft Report, the Board signalled its general agreement to the proposed noise conditions and the draft Noise Management Plan (NMP) as set out in the noise experts' 23 March 2010 document in preference to the conditions included in the MRP 28 March 2010 Resource Consent Conditions. In doing so, we remained unclear as to why most of the provisions contained within the draft NMP of the 23 March 2010 document were not included as primary noise conditions, and it was our decision that unless there were very good reasons, all of these NMP provisions should form part of these conditions.

Accordingly, in conjunction with PNCC, MRP was requested to prepare a revised set of noise conditions to include all of the provisions set out in detail at the end of the noise chapter of the Draft Report, with particular reference to the provision for

⁶ Witness for Huatau Marae on noise.

⁷ Witness subpoenaed by the Board.

a secondary noise limit to apply, for the progressive assessment and measurements of noise as the turbines are installed on the wind farm, and for a specific method for testing for SAC.

In its comments on the Draft Report, PNCC signalled its agreement to MRP's proposed May 2011 noise conditions except for disagreeing with MRP's proposal to exclude the 'Trevathan/Lloyd' condition for the progressive assessments and measurements of noise as requested by the Board in the Draft Report. This Board request (which is confirmed) is precautionary to preclude the risk of a repetition of the *Project West Wind* noise problems, which only became apparent after all of the wind farm turbines had been installed and commissioned.

In its comments, MRP was also reluctant to accede to the Board's request for specific content of the draft NMP to be included in the conditions, with this reluctance being based on the view that the NMP should be retained as originally proposed in order to maintain flexibility. The Board confirms its view that the requirements contained in the draft NMP should all be mandatory and that, as such, they should form part of the conditions.

In her comments, one of the submitters, Dr Huffman, requested that the secondary noise limit wind speed should be measured at the residences rather than at the wind farm, and that speeds of 8m/sec and 10m/sec should be included (in addition to the proposed 6m/sec). Having considered this request, the Board has decided that the 6m/sec wind speed should prevail (as recommended in NZS6808), and that the wind speed should be measured at the wind farm but with the proviso that there should be two locations for this measurement, one in the vicinity of the turbines at the northern end of the wind farm and one at the southern end.

Despite requests from a number of submitters for the deletion of further turbines at both the northern and southern ends of the wind farm, the Board has decided that, with the agreed noise conditions, no further deletions are required.

Dr Huffman also requested that, rather than the noise conditions being reviewed at one, three and five years post the completion of construction as proposed by MRP, these reviews should be undertaken annually. The Board has confirmed the review periods proposed by MRP, but requested that, following the completion of the Year 5 review, subsequent reviews should be undertaken at five-yearly intervals throughout the life of the wind farm. Also, for the avoidance of doubt, if MRP should elect to construct the wind farm in stages, the noise review timetable should commence from the end of the construction of the first stage.

In its comments, the New Zealand Wind Energy Association expressed concern that in its view, the Board has elected to apply more stringent noise conditions than provided for in NZS6808:2010, particularly with respect to the inclusion of a secondary noise limit. In response, the Board notes that, while it has taken strong guidance from NZS6808, it has also taken account of all of the evidence it heard and not just the content of the Standard.

In their comments, the Adams family restated their claim that a small building on their land, known as the Hautika Retreat, should qualify as a residential dwelling

for noise limit purposes. Following detailed consideration of this matter, the Board has concluded that the retreat does not qualify as a residential dwelling.

Following its consideration of all comments received on the noise chapter of the Draft Report, the Board confirms its earlier request for MRP to include in the conditions the 'Trevathan/Lloyd' condition for the progressive assessments and measurements of noise; for the specific content of the proposed NMP to be included in the Conditions; with respect to the secondary noise limit, for the wind speed to be measured at the wind farm at two locations, one in the vicinity of the turbines at the northern end of the wind farm (to be used for the residences at this end) and one at the southern end (for the residences at that end); and following the Year 5 review of the noise conditions, for subsequent reviews to be undertaken at five-yearly intervals throughout the life of the wind farm and, that if MRP should elect to construct the wind farm in stages, for the noise review timetable to commence from the end of the construction of the first stage.

All of these requested amendments, itemised in detail in the tables at paragraph 7 of Chapter 20, have been incorporated in the approved Resource Consent Conditions attached to this Final Report.

Public Opinion Surveys

MRP sought to strengthen its case for building the proposed wind farm by introducing the results of a public perception survey it had undertaken of Palmerston North residents. PNCC also presented findings of a social impact survey it had undertaken.

In her closing legal submission, counsel for MRP concluded that rather than being a project which the community was universally opposed to, as had been projected by many, if not most, of the submitters, the MRP public opinion survey had shown there to be a strong body of people who would like to see the wind farm developed. For its part, while the Board agrees that the surveys do indicate that an overall level of public support exists, this support reduces dramatically the closer the survey respondents live to the wind farm. In particular, for those respondents who live on the foothills of the Turitea Valley, the level of support is only 18%, with 67% in opposition.

The Board has also noted that Dr Layton is sceptical as to how the public perception surveys might be used to evaluate a particular effect from the construction and operation of the wind farm. Dr Layton notes that he did not undertake a non-market valuation of the community's willingness to pay because, in his view, their inherent uncertainties would lead to a lack of reliable guidance in weighing up the evidence of such effects.

Landscape and Natural Features

The two key issues which have had to be determined by the Board on landscape and natural features are whether the Turitea Reserve is an outstanding natural landscape (ONL) under s6(b) RMA and whether the skyline of the Turitea Reserve is an outstanding natural feature (ONF) under s6(b) RMA.

Based on our consideration of all of the expert evidence, we have concluded that the skyline is an ONF and that Turitea Reserve/Hardings Park is part of an ONL. The Board has also found that the skyline ridgeline of the Tararua Ranges, including specifically Back Ridge and Game Ridge of the Turitea Reserve as seen from Palmerston North, has high scenic qualities and natural character provided by its ONF characteristics, its prominence and backdrop vista to the city. These are in contrast to the region's plains.

The wind farm, as proposed by MRP, would have a significant adverse effect on these outstanding features and landscape, and the natural character would not be protected.

Turbines WT39–WT43 on Back Ridge (South) have been deleted as these would be an inappropriate development and would not protect the ONF.

Turbines WT56–WT66 on Game Ridge also break the skyline and have been deleted for the same reason.

In addition, as already noted, we have found that WT39–WT43, WT15–WT29 and WT57–WT66 are inappropriate and should be deleted for ecological reasons. This is because of the extensive native vegetation clearances which would be required for both access tracking and for the turbine platforms and the large concrete pads which would remain after consents have expired.

Turbines WT127–WT131, WT134–WT136 and WT56 on Love Ridge cause adverse amenity effects on immediate properties due to their dominance and act as a picket fence, piercing the skyline when seen from public viewpoints within and around Palmerston North. Although not located within the reserve, their presence on a parallel ridge would extend the prominence of turbines across much of the visible internal parts of the Turitea Reserve, negating efforts to protect the skyline, the ONL and the ONF of Hardings Park. For these reasons, these turbines have been deleted.

Landscape and Visual Amenity Effects

This is one of the first wind projects in New Zealand that will impact on a large population base. Visual amenity landscapes and the potential effects the project may have on viewers' perceptions and lifestyles were thus one of the most significant issues to be discussed during the inquiry. It is complicated because many of the rural residential landowners live in the lower foothills/slopes of Turitea and its valleys, some in close proximity to the turbines, with topography intermittently providing shelter from, or exposure to, multiple layers of wind turbines. It is a significant issue, too, for the residents of the urban area and the environs of Palmerston North itself, because of the potential visual impact from public places.

In terms of general conclusions, we have decided that, from a public viewpoint perspective at least, the scale of the ranges is sufficiently large to accommodate one of MRP's options for 125-metre high turbines. Conversely, we do not agree with planting as a general mitigation technique for dominant turbines, that the number of viewers should be determinant of the acceptability or otherwise of the

visual effects of the proposed turbines or that the findings of the public perception study are an acceptable basis on which to ‘mitigate’ significant adverse effects for a controversial wind farm.

From an infrastructure perspective, the transmission lines required for the project will have significant effects, but we note that landowners have granted permission where these are located on private land. The landscape and visual effects of the substations is mitigated to a significant extent by their discreet locations, and can be further mitigated by planting.

The Board acknowledges that there were major gains for the landscape and visual amenity from the redesign, particularly for nearby communities and residents. But even with these gains, a significant amenity landscape would still be compromised without further modification of the design. For example, the remaining Bryant Hill turbines contribute to an isolated effect, while the Love Ridge turbines contribute to a picket-fence effect across the back ridge sequence and skyline. Both effects are significant and adverse on amenity values associated with the signature feature of the Turitea Reserve as seen from public viewpoints.

Grouping of the turbines has been a useful tool for analysis, providing assistance when referencing turbines within the wind farm. This grouping did not, however, detract from our assessment of the effects of individual turbines, as is evidenced by the fact that our retention or deletion of turbines has not always followed the group boundaries.

Turbines in Groups D and E

We have concluded that the Group D turbines will be dominant and that their effects on the integrity of the Tararua Ranges will be severe, with turbines south of WT11 having significant adverse landscape and visual effects. As already noted, WT15–WT29 and WT39–WT43 have been deleted as these will adversely affect the valued public amenity views of the Tararua skyline and internal views of the Turitea Reserve’s Back Ridge ONF from Fitzherbert Avenue.

In our Draft Report, we noted in particular the negative effect of the Group D and E turbines on the Percy family in Makomako Road, and we invited MRP to consider some form of compensation for the Percy family. In its comments on the Draft Report, MRP advised that it had reached agreement with the Percy family and this was subsequently confirmed in a communication from the Percys to the Board. In their comments on the Draft report, one other family, the McBrides, advised that they were negatively affected in a similar way to the Percys. Whereas, Mrs Percy had made an oral presentation to the Board at the hearing which had triggered our invitation for MRP to meet with the Percys, the McBrides had been unable to attend the hearing and make a presentation as they were living away from the Manawatu at that time. Now that we have been made aware of the McBrides situation, we invite MRP to consider some form of compensation to this family as well as the Percys.

In its comments on the Draft Report, MRP requested the inclusion of three additional turbines at the northern end of Group E. In the absence of any evidence on the effects of these three proposed turbines, the Board has concluded that if

MRP wishes to pursue this request, it should do so under a separate consent application.

Turbines in Groups G, F and H

Most of the Group G turbines along the Hardings Park boundary present a significant adverse effect on the outward scenic views from Red Knock Knob from a relatively confined viewpoint. We empathise with Mr Brown's⁸ view that these effects have to be balanced against the very much more limited impact that the proposed wind farm would have in respect of the rest of Hardings Park and that they are not, in his opinion, sufficient to warrant the significant amendments required to address the impacts on Red Rock Knob in isolation.

We similarly accept Mr Bray's⁹ evidence that external views from the west of the G Group are screened to varying degrees by the topography of Game Ridge and Tirohanga. The turbines east of WT33, plus the turbines in the F and H Groups, are primarily seen from the west in terms of a rural character rather than a natural character context.

In our Draft Report, we noted that the removal of WT122–WT125 from Group H, under the MRP redesign, had resulted in a very positive impact for the views for the residents of Greens Road and Kahuterawa Road, and we commended MRP for this. In doing so, the Board accepted the retention of the remaining turbines in Groups F and H.

In their comments on the Draft Report, Mr and Mrs Love sought the retention of some or all of the turbines WT123–WT125 possibly through recessing these turbines away from the original design locations. In their comments, the Loves noted that this would be addressed by MRP in its comments on the draft.

For its part, MRP sought the reinstatement of WT122–WT124, three turbines which MRP of its own volition had elected to remove during its 2009/10 redesign of the wind farm.

The Board has been unable to identify any additional landscape or visual amenity evidence which would support the reinstatement of these turbines either in their original locations or in a recessed location. As such, the Board confirms its original decision that these turbines should be removed.

Turbines in Group J

Earlier, in this Executive Summary, we concluded that the Group J turbines on Game Ridge (apart from WT56) should be deleted for ecological reasons. In our assessment of the public viewpoints from the Manawatu Plains and Palmerston North, these turbines are also seen clearly on the skyline and would have significant adverse effects on the natural character of this ONF. For these reasons, they should also be deleted.

⁸ Witness for MRP on landscape.

⁹ Witness for TAG and FOTR on landscape.

Turbines in Group K

We have concluded that for visual amenity reasons the turbines WT127–131 and WT134–136, in Group K on Love Ridge, should be deleted. WT56 in Group J reads from the west as part of Group K and should also be deleted. Conversely, WT54, the remaining turbine in Group K, reads from the west as part of Group G and can remain.

Turbines in Group A

In their redesign, MRP removed some 13 turbines that caused offence on Bryant Hill. In its Draft Report, the Board commended MRP for taking such a significant step to sustain this part of the foothill's environment. In doing so, the Board concluded that the remaining five turbines (WT74–WT78) on Bryant Hill should also be removed.

In their comment on the Draft Report, Ngawai Farm Limited (Mr Waters) disputed the Board's landscape and visual amenity decision to remove WT74–WT78 while at the same time making no comment on MRP's removal of a much larger number of turbines for the same reasons. The arguments advanced in the Ngawai Farm comments for the retention of WT74–WT78 do not, in the Board's view, outweigh the Board's reasons for their removal.

Turbines in Group C

WT95 in Group C is within 1 kilometre from the Grassick property, and while the frontage of the Grassick house overlooks several *Te Rere Hau* turbines, the rear of the property is immediately adjacent to WT95. In our Draft report, we concluded that this turbine was dominant and should be removed. The decision for its removal has been strongly opposed by Mr Poff, who notes in his comments on the Draft Report, that WT95 is the closest remaining turbine to his house although he would not draw any financial benefit from its operation. Mr Poff's opposition to the removal of WT95 should be seen in the light of his concluding comment that if there is a strong wind resource in a particular area such as *Turitea*, then priority should be given to developing this resource, notwithstanding the negative environmental effects which might arise from the development.

Following its consideration of Mr Poff's comments, the Board has not been persuaded to change its finding that WT95 should be removed.

Cultural

Tanenuiarangi Manawatu Incorporated (TMI) is the legal entity for Rangitane o Manawatu (ROM) since 1989.

Rangitane o Tamaki nui a Rua (ROTNAR) is the iwi authority for Rangitane on the eastern side of the ranges.

Huatau Marae is based on Greens Road just below the proposed wind farm site. This marae is unique in the sense that the people of the marae are affiliates of another iwi based in the Rangitikei District. This marae was established by

the Adams family within the rohe of Rangitane with the sanction of some of its elders.

MRP's signing of a Memorandum of Understanding (MOU) with TMI and an agreement in principle to move to an MOU with ROTNAR recognise that the lands on and adjacent to the *Turitea* site are the ancestral lands of these two iwi. These MOUs will be important mechanisms for recognising and providing for the relationship of these two iwi with their ancestral waters within the wind farm site.

The Board recognises that the proposed cultural monitoring plan will be an important component in fulfilling the recognition of this aspect of s6(e). In addition, the consent conditions which provide for the participation of TMI in the revegetation work will assist in the relationship of TMI with its ancestral waters.

It is also part of the MOU with TMI that a Pou Whenua will be commissioned at the entrance to the wind farm, an important outcome that will recognise the mana whenua of ROM.

The enduring relationship envisaged in the MOU with TMI is also seen as a means for recognising and providing for the culture and traditions of Rangitane on the wind farm site. This relationship will be important in order to counter any imbalance between the adverse effects of the wind farm with the cultural identity of the tribe. MRP's undertaking for blessing ceremonies prior to construction also recognises the importance of tikanga Māori to Rangitane.

Turning to wāhi tapu and other sites, MRP's agreement to remove WT55 along with its commitment to work closely with TMI on the turbine sites that affect Ramiha, Marima, Te Mata and Mairehau will recognise and provide for the relationship of ROM with their sites and wāhi tapu. The conditions regarding the Accident Discovery Protocol will also provide a process for dealing with unknown sites that may arise in the process of constructing the wind farm.

Concerns over taonga will be addressed through the cultural monitoring plan. The planned revegetation of Browns Flat should also assist in creating biodiversity for taonga species to flourish. It is also envisaged, under the MOU, that ROM will receive other monitoring plans in order for them to be able to track numbers and condition of taonga species. The removal of the turbines in areas of indigenous vegetation within the reserve should also lessen the impact on taonga species.

The Board finds, in having regard for kaitiakitanga, that MRP has achieved this through developing the MOUs, including the cultural monitoring plan, protocols for the placement of turbines WT99 and WT27, and the removal of WT55. (It is noted that this will be assisted through the Board having deleted WT27 for ONF reasons.)

We are satisfied that there has been adequate consultation between MRP, TMI and ROTNAR, with the processes culminating with the MOUs which set out agreed actions.

Despite concerns raised by Huatau Marae, we consider that MRP has followed good practice in its consultation with this marae. MRP has listened to the marae's

concerns and has undertaken several ‘actions and commitments’ including the commissioning and provision of photomontages, background noise monitoring, a commitment to seal parts of Greens Road, and the removal and repositioning of several turbines in the vicinity of the marae. For the purposes of the RMA, and based upon the evidence presented, the Board is limited in recognising the kaitiaki status of the marae itself as well as the surrounding marae lands. But the Board notes that, in having regard for the kaitiakitanga of the marae, specific adverse effects of the wind farm proposal on the marae have been taken into account in the Board’s overall deliberations.

In response to consideration of the principles of the Treaty of Waitangi as required under s8 of the RMA, MRP has agreed three key measures. The first is to include a review condition to protect the potential outcome of any future Treaty settlement that may intersect with the lands involved with the wind farm proposal. The second measure is the development and agreement of the two MOUs with TMI and ROTNAR. These documents take into account the Treaty principles of active protection and partnership, whilst also allowing the tino rangatiratanga of these two iwi to be upheld. The third measure, as noted by Mr Henry of MRP in his supplementary evidence, is that MRP will be ‘establishing a tertiary scholarship’ as part of the MOU with TMI to assist in building the capacity of the iwi to uphold their position as a Treaty partner into the future.

Submissions on the cultural issues chapter of the Draft Report were received from a number of parties all associated with the Huatau Marae. Key issues raised included requests for Huatau Marae representation on the Community Liaison Group; a request for disclosure of the MOU between TMI and MRP; a claim that TMI’s mandate is confined to the Treaty settlement process; criticism of the Board’s view on the level of rights regarding ancestral lands attributed to Huatau Marae; and a claim that Huatau Marae is a wāhi tapu which should be recognised and provided for.

The Board has considered each of these matters and, apart from making a correction to record that it was the Jones whānau and not the Adams who had established the marae, concluded that no other modifications were required to the findings in the Draft Report. Further, based on the evidence presented, the Board is satisfied that MRP has responded well in meeting its obligations under s6(e), s7(a) and s8 RMA with respect to the wind farm proposal.

Planning Instruments

Section 104(1) RMA provides that, when considering an application for a resource consent and any submissions received, the consent authority must have regard to (inter alia):

- (a) ...
- (b) any relevant provisions of –
 - (i) a national policy statement:
 - (ii) a New Zealand coastal policy statement:
 - (iii) a regional policy statement or proposed regional policy statement:

- (iv) a plan or proposed plan; and
- (c) other matters the consent authority considers relevant and reasonably necessary to determine the application.

The planning documents against which the Board has evaluated the wind farm proposal are as follows:

- National Policy Statement: Renewable Electricity Generation (2008);
- Proposed National Policy Statement: Renewable Electricity (2008);
- Operative National Policy Statement: Renewable Electricity Generation 2011;
- Manawatu-Wanganui Regional Council Regional Policy Statement;
- Manawatu-Wanganui Regional Council Regional Air Plan;
- Manawatu-Wanganui Regional Land and Water Plan;
- Manawatu-Wanganui Regional Plan for the Beds of Rivers and Lakes;
- Manawatu-Wanganui Regional Council Regional Water Quality Regional Plan;
- Operative PNCC District Plan;
- Operative Tararua District Plan;
- Proposed One Plan (Horizon's Regional Council Proposed Regional Plan);
- New Zealand Energy Strategy (2007);
- New Zealand Energy Efficiency and Conservation Strategy (2007);
- Turitea Reserve Management Plan.

The key issues arising from these planning provisions are:

- renewable energy and climate change matters;
- land use and water (water/sediment concerns);
- outstanding and significant natural features and landscapes, and their identification in the operative regional policy statement (RPS).

In its comments on the Draft Report, MRP argued that, as the NPSREG had become operative on 13 May 2011, the Board should review its draft decision to afford more weighting to the NPSREG. In response, the Board (inter alia) invited all parties to make submissions on the effects that the operative policy might have on the Board's draft decision.

Following its consideration of all comments received, the Board concluded that, while the final policy is different from the draft, there are no differences that would materially change the emphasis that the Board had placed in its draft decision on renewable energy and the benefits of combating climate change.

The Board is therefore satisfied that the wind farm proposal is consistent with the provisions of the national policy statements on energy generation and renewable

energy as well as the national strategies on energy and energy efficiency and conservation.

Likewise, the Board has satisfied itself that the proposal meets many of the provisions of all of the regional plans and the two district plans.

The Board has put particular emphasis on the evaluation of the RPS provisions for the identification of outstanding and significant natural features and landscapes within the wind farm site. Our findings against the individual policies of the RPS may be summarised as follows:

- the main ridgeline and skyline along the *Turitea* site is a major geological/geographical feature in its setting and because of this contributes significantly to the region's character;
- there is a clear relationship spatially between the ranges and Palmerston North, with the visual prominence and scenic characteristics of the Tararua Ranges in the location of the Turitea water catchment providing a signature backdrop feature both to the city and the Manawatu Plains;
- the vast majority of the Turitea Reserve, despite its minor modifications, through to Hardings Park and the Tararua Forest Park, is an important area of ecological significance in terms of its indigenous flora which brings it within the ambit of s6(c) RMA, the requirement to recognise and provide for the protection of areas of significant indigenous vegetation.
- Turitea Reserve (and Hardings Park Ridge), because of its recreational values, demonstrates some of the 'intrinsic values' identified under s2(b) RMA and is affected adversely by what is proposed;
- the landscape of the Turitea Reserve is an ONL as a matter of fact and it is to be protected from inappropriate use and development under s6(b) RMA;
- the major geographical/geological features of *Turitea*, including the skyline, under the RPS are regionally significant as an ONF and are to be protected from inappropriate use and development under s6(b) RMA;
- the area of significant ecological value on the site (the water catchment area down to Hardings Park) is an ONF, to be provided for and protected as a matter of national importance under s6(c) RMA;
- the ecological footprint of the Turitea Reserve, which includes Game Ridge and the ecological areas on the Back Ridge (South), should not be disturbed, as an ONF and part of the ONL;
- the key question is not whether the RPS is correct to determine the skyline is an ONF, but whether what MRP proposes protects the identified values of the ONF.

The Board has concluded that a number of the turbines proposed in the Turitea Reserve do not protect these values. The identification of the offending turbines and the removal or mitigation measures proposed for them are summarised in our Part 2 RMA evaluation.

Other matters, such as traffic and noise, are addressed in the individual chapters of this report, with the Board being satisfied that the final conditions and

management plans for each meet the requirements of the relevant planning provisions.

Resource Management Act 1991: Part 2 Determinations

The RMA defines the law relating to the use of land, air and water. Section 5 of Part 2 defines the purpose and principles of the Act. In turn, s5 matters are informed by the issues raised in 6, 7 and 8. The Board's evaluation of the wind farm against each of these sections is described in detail in Chapter 19 of this report.

We have determined that the Turitea Reserve is an ONL, and that it contains ONFs. In its Part 2 RMA evaluation, the Board has been required to decide on the weight that should be placed on protection of the ONL and ONFs from inappropriate development. In doing so, we have concluded that many locations within Palmerston North view the internal Turitea Reserve, which the RPS has found to be an ONF, and the skyline back ridge, which the RPS defines as an ONF (with which we agree).

We also find that significant parts of the Turitea Reserve are to be protected for ecological reasons under s6(c).

We have already listed the turbines which we have decided should be declined for ONF and ONL landscape or ecology protection reasons.

Despite FOTR's request for their deletion, we have decided that turbines WT30–WT37 along the boundary with Hardings Park can be retained even though they would be placed in an area of ecological significance (an ONF and an ONL). WT44–WT46 can also be retained in their relocated positions closer to the water catchment access road.

While the adverse effects on recreational users of Red Rock Knob from the placement of these Hardings Park Ridge turbines cannot be mitigated, and the placement of turbines across the continuum of the ONL is acknowledged, our reasons for the retention of these turbines are as follows:

- the widening of the water catchment access road and its two new road alignments, even though through dominant horopito vegetation, will create access for the construction of 23 turbines in the G, H and K (WT54) and F Groups, which for 3MW turbines have the combined potential to generate up to 69MW of electricity;
- WT30–WT35 are substantially screened from many parts of Palmerston North by the high ground of Tirohanga and Game Ridge, and acknowledging Mr Brown's reference to the ranges as a signature feature, and their role as a focal feature in views from Palmerston North, these turbines can remain while still providing for this reference.
- WT36–WT37 are acceptable as they form part of the visual grouping of the remaining Group G turbines and with the F and H groups;

- from an assessment of the Beca drawings for turbine locations, these turbines (WT30–WT37) are already located alongside the water catchment access road;
- there will be mitigation of the resulting effects by rehabilitating with native vegetation those sections of the water catchment access road which will become redundant once the two new realignments have been put in place and the rehabilitation/restoration of some 10 hectares of Browns Flat.

We have determined that, with the deletions we have made from MRP's redesign, and the relocation of the turbines on Hardings Park Ridge, the project will meet all the provisions of s5(2) of the Act.

The turbines that will remain and are approved will be 60 in number, being 33 in the north and 27 in the south, namely:

- Group C: WT67–WT71, WT96 (six turbines)**
- Group D: WT1–WT9, WT11–WT14, WT97–WT98, WT30–WT33 (19 turbines)**
- Group E: WT10, WT38, WT99–WT107, WT109 (12 turbines)**
- Group G: WT34–WT37, WT44–WT48, WT110 (10 turbines)**
- Group F: WT115–WT118 (four turbines)**
- Group H: WT52, WT111–WT114, WT119–WT121 (eight turbines)**
- Group K: WT54 (one turbine)**

Conditions of Consent

Attached to its comments on the Draft Report, MRP submitted a set of revised resource consent conditions dated May 2011. By and large this revision included the amendments to the conditions requested by the Board in its Draft Report.

MRP, PNCC, HRC and DOC, as well as a number of submitters, proposed further changes to these conditions, particularly those on noise and traffic. Following our evaluation of these proposed changes, we requested MRP to make a number of further amendments to the conditions. These requested amendments, summarised in the tables at paragraph 7 of Chapter 20 of this report, have all been incorporated in the *Turitea Wind Farm – Resource Consent Conditions, 5 August 2011* approved by the Board.

A copy of these approved conditions is attached to this Final Report.

Consent Lapsing Period

Under s125 RMA, a resource consent lapses five years from the date of its commencement unless it has been given effect to before the end of this period or the resource consent expressly provides for a longer lapsing period.

MRP has requested that all of the resource consents have a 10-year lapse period. MRP's reasons for requesting this period are based on a number of factors, including New Zealand's demand for electricity, the availability of the design of turbines at a favourable exchange rate, and the pre-construction studies to be undertaken. MRP has submitted that a 10-year lapse period will provide it with

enough flexibility to enable the full implementation of the proposed development should these factors not be favourable within the normal five-year timeframe. On balance, we have decided that these factors outweigh submitter concerns over extended uncertainty that a 10-year lapse period might create for them.

We reaffirm our Draft Report decision, as provided for in the approved Resource Consent Conditions, for a 10-year lapse period. For the avoidance of doubt, this lapse period shall apply to the overall Turitea wind farm irrespective of whether MRP elects to develop the wind farm in stages, that is, if constructed in stages, a start on all stages must have been made within the 10-year lapse period.

Consent Duration

MRP has sought the maximum duration of 35 years allowed for under the RMA for the resource consents associated with the project. For a project of this magnitude and kind, and with the level of investment required, we consider that the requested 35-year term for the consents is appropriate and a 35-year term is agreed.

Chapter 1: Introduction

[1] The proposed Turitea wind farm is located along the ridgelines of the northern Tararua Ranges in the *Turitea* Reserve and on surrounding farmland, 10 kilometres to the south east of Palmerston North. The notified proposal submitted by Mighty River Power (MRP) consisted of 122 turbines. This was later revised by MRP to 104 turbines.

Ministerial Call-in

[2] On 18 December 2008, the Hon Dr Nick Smith, Minister for the Environment, considering the Turitea wind farm (*Turitea*) a proposal of national significance, invoked s141B of the Resource Management Act 1991 (RMA) and called in the resource consent applications.

[3] In deciding to call in the proposal, the Minister gave the following reasons for referring the matter to a Board of Inquiry (BOI):

- the proposal affects or is likely to affect or is relevant to New Zealand's international obligations to the global environment;
- the proposal affects or is likely to affect more than one region or district;
- the proposal will contribute to the achievement of the national target of 90% of electricity generation from renewable energy sources by 2025;
- the proposal will have national benefits deriving from the use and development of renewable energy in accordance with s7(j) RMA.

Terms of Reference of the Board

[4] The Board is required to hold public hearings in the area of the wind farm and produce a draft report and then a final report stating its decision giving reasons for its findings.¹ The draft and final reports are required to include the principal issues and the findings of fact.

[5] The Board is required to conduct the inquiry in accordance with the provisions of the RMA and in particular ss147–149. The factors to which it was required to have regard included the Minister's reasons for calling the matter in under s141B(2).

[6] Subject to the RMA and the Terms of Reference, the Board is required to determine its own procedures. It is also required to carry out its functions, powers and duties as promptly as was reasonable in the circumstances in accordance with ss21 and 41 RMA.

¹ Terms of Reference prepared by the Ministry for the Environment dated 18 December 2008.

[7] Section 148 requires as follows:

148 Board to produce draft report

- (1) As soon as practicable after a board of inquiry has completed an inquiry under section 147, it must –
 - (a) make its draft decision; and
 - (b) produce a draft written report.
- (2) The draft report –
 - (a) must state the board’s draft decision; and
 - (b) must give reasons for the decision; and
 - (c) must include the principal issues; and
 - (d) must include the findings of fact;
 - (e) ...
 - (f) ...
- (3) ...
- (4) The board must invite the persons to whom the draft report is sent to send their comments on any aspect of it to the board within 20 working days of the date of the invitation.

[8] After following procedures under s148(1) and (2), the Board is then required to produce a final report as follows:

149 Board to produce final report

- (1) As soon as practicable after the 20 working days referred to in section 148(4), the board of inquiry must –
 - (a) consider any comments received; and
 - (b) make its decision; and
 - (c) produce a written report.
- (2) The report –
 - (a) must state the board’s decision; and
 - (b) must give reasons for the decision; and
 - (c) must include the principal issues; and
 - (d) must include the findings of fact; ...
 - (e) ...
 - (f) ...

Renewable Energy in the Turitea Reserve

[9] In 2004 the Palmerston North City Council (PNCC) sought expressions of interest from potential developers for the construction of a wind farm in the Turitea Reserve² with MRP being chosen from this process as the preferred tenderer.³ Once MRP had provided details of the potential configuration of the wind farm, PNCC was obliged under the Reserves Act 1977 to consider a change of purpose of the reserve to allow for the development of renewable energy. Subsequently, in October 2006 at the conclusion of public consultation, PNCC

² Naylor, EIC p3.

³ Ibid, p4.

amended the Turitea Reserve Management Plan (TRMP)⁴ to include, as its first purpose, ‘renewable electricity generation’.⁵

[10] The local residents’ groups lodged an appeal in the High Court against PNCC’s decision with this appeal being unsuccessful (*Friends of Turitea Reserve Society Incorporated v Palmerston North City Council*).⁶

[11] MRP then proceeded to develop its full proposal for the wind farm, consent for which is the subject of this inquiry.

The Parties and their Positions

Applicant

[12] MRP⁷ is a state-owned electricity retailer and generator. Its generation assets produce up to 22% of New Zealand’s peak energy demand. While MRP’s generation activities have historically been focused on hydro-electric and geothermal generation, it is currently seeking to diversify its generation portfolio.

[13] The development agreement between PNCC and MRP provides MRP with the opportunity to obtain a licence for the construction and operation of the Turitea wind farm, a lease for the wind farm site and easements for various wind farm services.

Councils

[14] The proposed wind farm falls under the jurisdiction of three councils: the PNCC, the Horizons Regional Council (HRC) and the Tararua District Council (TDC).

[15] At the outset of the hearing, PNCC advised the inquiry that it did not have a formal position of support or opposition to the proposed wind farm. It had undertaken its own independent analysis of the proposal for the purpose of ensuring there was a full examination of the potential environmental effects and presented expert evidence to the hearing on these effects.

[16] HRC took a neutral position – it neither supports nor opposes the proposal. HRC called one witness who gave planning evidence at the hearing and evidence relating to draft conditions.

[17] TDC did not participate in the hearing process.

⁴ Naylor, p7.

⁵ Ibid.

⁶ (HC) CIV-2006-454-879 per Baragwanath J.

⁷ MRP, *Turitea Wind Farm Assessment of Environmental Effects*, August 2008, p4.

Landowners

[18] Ngawai Farm Limited owns 563 hectares of land that runs between Turitea Road and the Pahiatua Track. The property completely surrounds the proposed wind farm site on the north-western boundary of the Turitea Reserve. Ngawai Farm presented their case alongside Joseph Poff, Maurice and Dorothy Alley and John and Kathryn Love who are also private landowners in the proposed wind farm site. These landowners supported the original MRP proposal on the basis there were benefits to be derived in terms of sustainability, utilising a world-class wind resource and the economic wellbeing of the region.

[19] MRP's redesign of the wind farm part-way through the hearing resulted in a reduction in the number of turbines on these private landowners' properties. The landowners opposed the redesign as in their opinion this would mean a very valuable wind resource would not be harnessed to the greatest extent possible.⁸

Community Groups

[20] Tararua-Aokautere Guardians Incorporated (TAG) is a group of affected residents, including residents of the wider Manawatu and Tararua regions, who are concerned about issues associated with wind farms including the adverse effects of wind farms on the natural landscape and upon people and communities. TAG was opposed to the proposed wind farm and asked that the application be declined in its entirety.

[21] Friends of Turitea Reserve Incorporated (FOTR) is an incorporated society that is dedicated to preserving the underlying 'naturalness' of the Turitea Reserve by maintaining the quiescent, tranquil nature of the landscape within and around the Turitea area.⁹ FOTR is opposed to the proposed wind farm and asked that the application be declined in its entirety.

Iwi Authorities

[22] Tanenuiarangi Manawatu Incorporated (TMI) is the mandated iwi authority for Rangitane o Manawatu and is responsible for responding to and reporting back on environmental issues. TMI had concerns about the impact of the proposal on cultural values and suggested a number of methods to mitigate its concerns. Prior to the hearing MRP had adopted the majority of the measures proposed by TMI and had developed a Cultural Monitoring Plan and entered into a Memorandum of Understanding (MOU) with TMI.

[23] Rangitane o Tamaki nui a Rua (ROTNAR) is the iwi authority for Rangitane on the eastern side of the ranges. MRP has an agreement in principle to enter into an MOU with ROTNAR.

⁸ Ngawai Farm Limited, Joseph Poff, Maurice and Dorothy Alley and John and Kathryn Love, Closing Submission, 29 March 2010, p2.

⁹ TAG/FOTR, Closing Submission, 30 March 2010, p2.

[24] Huatau Marae, which is located off Greens Road, serves the needs and aspirations of 140 whānau and provides a focal gathering point for the wider community.¹⁰ Huatau Marae Trustees opposed the application in its entirety for cultural, noise, traffic and landscape reasons.

Other Groups

[25] The Energy Efficiency and Conservation Authority (EECA) is a body established under the Energy Efficiency and Conservation Act 2000 to promote ‘energy efficiency, energy conservation, and the use of renewable sources of energy’. It supported the proposal on the basis that it is a renewable energy development that will result in significant benefits associated with improving security of electricity supply and reducing greenhouse gas emissions.

[26] The New Zealand Wind Energy Association (NZWEA) promotes the uptake of New Zealand’s abundant wind resource as a reliable, sustainable, clean and commercially viable energy source. The NZWEA supported the proposal.

[27] The Department of Conservation (Wanganui Conservancy) (DOC) lodged a neutral submission. While it supported the development of renewable energy resources, it is concerned about the adverse effects of the proposed wind farm on natural values present in the Turitea Reserve. DOC and MRP have agreed on conditions of consent to address these concerns.

Submitters (Residents and Those with an Interest Generally)

[28] The Ministry for the Environment (MfE) received 702 submissions, with 222 indicating that the submitter wanted to be heard by the BOI in support of their submission. Given the large number of submitters who wished to be heard, the Board requested that submitters form groups representing issues of common interest. Of those who indicated that they wished to be heard, 120 were heard in the first stage of the hearing.

[29] For MRP’s redesign, a further 126 submissions were received by the Board with 117 indicating that the submitter wanted to be heard in support of his/her submission. Given that many of the submissions either repeated their original submission, or did not contain any new issues relating to the redesign, 31 were heard during the second stage of the hearing.

The Notified Proposal

[30] The overall site is located within the Turitea Reserve and also on adjoining farmland. Within the reserve, the land predominantly supports native vegetation, with some introduced species. The adjoining farmland is generally pasture used for sheep and cattle grazing.

¹⁰ Huatau Marae, Closing Submission, 30 March 2010, p1.

[31] MRP's notified proposal was for 127 potential turbine locations to accommodate a maximum of 122 turbines. The proposal indicated three-bladed turbines with 80 metre towers, a rotor diameter of some 90 metres and a maximum height with a rotor blade vertical of about 125 metres. The location of the proposed wind farm is indicated on a map in Appendix 4 of this Final Report. A layout of the notified proposal is attached in Appendix 5.

[32] In addition, the notified proposal included:

- alterations to existing access tracks and private roads within the wind farm site;
- construction of a number of new tracks within the site to provide access to individual turbines and some transmission tower sites;
- vegetation clearance for the creation of these access tracks, road widening, the creation of turbine platforms and lay down areas, substations and other ancillary activities;
- the disposal of excess excavation material at identified areas within the site;
- site reinstatement, revegetation and new areas of planting within the site;¹¹
- the construction of up to three permanent wind monitoring masts of up to 80 metres in height within the site;
- an internal transmission network to take electricity generated from each turbine to two on-site substations;
- an external transmission line to connect the site with the national grid at Linton;
- minor upgrading of some of the public roads providing external access to the site;
- ongoing maintenance activities including the monitoring, repair and replacement of turbine components; substation equipment; reticulation network; transmission lines and structures and monitoring masts and roading.

The Revised Proposal

[33] During September 2009, near to the end of the first stage of the hearing, MRP advised, by way of Memorandum of Counsel, that it intended to reconsider the wind farm layout.

[34] Some five months later in February 2010, MRP submitted details of its revised proposal, which became known as the redesign. Following a period of time allocated for the consideration of the redesign by other parties, the hearing was reconvened in March 2010 to hear evidence on the MRP redesign.

¹¹ MRP, *Turitea Wind Farm Assessment of Environmental Effects*, August 2008, p5.

[35] Of the 127 turbine zones originally proposed, the redesign deleted 21 zones and relocated a further 44 to more visually recessive positions. All of the 21 deleted zones were located on private farmland outside of the Turitea Reserve.

[36] In summary the revised layout comprises a maximum of 105 turbine zones within which a maximum of 104 2.3 megawatt (MW) turbines or 96 3MW turbines will be constructed with an installed capacity of up to 288MW.

[37] The key changes to the proposal as a result of the revised design are summarised in the table included on page 13.¹²

Consents Applied For

[38] The following paragraphs detail the consents applied for by MRP for the wind farm.

[39] Manawatu-Wanganui (Horizons) Regional Council

Land Use Consents:

- 104553: for vegetation clearance and land disturbance in rare or threatened habitats, near streams and on highly erodible land throughout the general wind farm site; and
- 104554: for the construction of a double culvert in an un-named tributary of the Kahuterawa Stream.

Discharge Permits:

- 104555: for the discharge of dust to air from the concrete batching plants proposed;
- 104556: for the discharge of dust to air from the mobile crushing plant throughout the general wind farm site;
- 104557: for the discharge of wastewater from two operations and maintenance facilities to land;
- 104558: for the discharge of stormwater from substations to land;
- 104559: for the discharge of cleanfill to land in the form of spoil disposal sites throughout the wind farm site; and
- 104560: for the discharge of stormwater from roads and turbine platforms, and other areas to land.

¹² MRP, *Turitea Wind Farm Assessment of Environmental Effects*, Turitea Wind Farm Redesign, February 2010, Table 1.

[40] Palmerston North City Council

Land Use Consents:

- to establish and operate a wind farm in the areas within the Palmerston North City jurisdiction;
- to undertake earthworks associated with tracking and roading, turbine construction and associated buildings in the areas within the Palmerston North City jurisdiction;
- for the western side of the Pahiatua Aokautere Road not meeting access requirements;
- for the storage of diesel (10,000 litres) in bunded areas outside the Turitea water supply catchment, generally located at the two substation laydown areas, that exceeds the 0.2 effects ration maximum in the rural zone; and
- for the construction of a 220 kilovolt (kV) electricity transmission line and substation.

[41] Tararua District Council

Land Use Consents:

- for a wind farm (which is not listed as a Permitted or Controlled Activity) in the areas within the Tararua District;
- for land disturbance of more than 200 cubic metres (m³) of soil and cleanfill material associated with tracking and roading, turbine construction, spoil disposal and other associated works in the areas within the Tararua District;
- for upgrades to South Range Road and the construction of new site access;
- for turbine and wind monitoring mast structures not meeting height requirements within the Tararua District;
- for the modification of a Significant Natural Feature in Schedule 3.3 (ie, Tararua Ranges Ridgeline);
- for not meeting noise requirements; and
- for clearance of indigenous vegetation in areas within the Tararua District.

Consent Lapsing Period

[42] Under s125 RMA, a resource consent lapses five years from the date of its commencement unless it has been given effect to before the end of this period or the resource consent expressly provides for a longer lapsing period.

[43] In its application for the Turitea wind farm, MRP requested that all of the resource consents have a 10-year lapse period. MRP's reasons for requesting this period are based on a number of factors, including New Zealand's demand for electricity, the availability of the design of turbines at a favourable exchange rate, and the preconstruction studies to be undertaken. MRP submitted that a 10-year lapse period would provide it with enough flexibility to enable the full implementation of the proposed development should these factors not be favourable within the normal five-year timeframe.¹³

Consent Duration

[44] In its application, MRP sought the maximum duration for resource consents associated with the project as allowed for under s123 RMA. These terms are as follows:

- Land Use Consents (under s9 of the RMA): Unlimited;
- Land Use Consent (under s13 RMA): 35 Years;
- Water Permit (under s14 RMA): 35 Years;
- Discharge Permit (under s15 RMA): 35 Years.

[45] The wind farm¹⁴ involves the long-term lease of both public and private land. Section 218(1)(a)(iii) RMA provides that:

(1) In this Act, the term subdivision of land means-

The division of an allotment –

...

- (iii) by a lease of part of the allotment, including renewals, is or could be for a term of more than 35 years;

[46] The leasing of land for the project is deemed to be a subdivision and a subdivision consent will be required from the PNCC and TDC for the wind farm. Applications for these will be lodged with the relevant council once the lease areas for turbines and roads have been confirmed with the relevant landowners during the detailed design phase.

Legal/Statutory Context

[47] The legislative and statutory documents under which this inquiry has been conducted are summarised in the following paragraphs. Appendix 1 to this Final Report sets out their more detailed provisions under which the proposal is assessed.

¹³ Price, MRP Closing Submission, 2.14.

¹⁴ MRP, Turitea Wind Farm *Assessment of Environmental Effects*, August 2008, p8.

Resource Management Act 1991

[48] The resource consent applications have been made, and called in, under the RMA. The RMA sets out the law relating to the use of land, air and water. Part 2 of the Act sets out the purpose and principles of the Act, and function as the substantive guidance to decision makers.

[49] MRP's application for the Turitea wind farm was called in by the Minister prior to the commencement of the Resource Management (Simplifying and Streamlining) Amendment Act 2009. By virtue of s155 of that Amendment Act, therefore, in determining MRP's application the Board is to apply the RMA as if it had not been amended. Any reference to a provision of the RMA in this report is therefore to that provision as it stood prior to the commencement of the Resource Management (Simplifying and Streamlining) Amendment Act 2009.

Commissions of Inquiry Act 1908

[50] Sections 4, 4B, 4D, 5, 6 and 7 apply in accordance with s41 RMA. The conduct of the Board and its inquiry have been undertaken in accordance with the Commissions of Inquiry Act 1908 by virtue of its incorporation by reference into s41 RMA.

Conservation Act 1987

[51] The Conservation Act 1987 promotes the conservation of New Zealand's natural and historic resources. The Act established the present Department of Conservation, formed to integrate conservation management functions into one department, and sets out the majority of DOC's responsibilities and roles. The Reserves Act 1977 is listed in the First Schedule of the Conservation Act 1987 as one of the enactments administered by DOC.

Health and Safety in Employment Act 1992

[52] The object of the Health and Safety in Employment Act 1992 is to promote the prevention of harm to all people at work, and others in, or in the vicinity of, places of work. The Act applies to all New Zealand workplaces and places duties on employers, the self-employed, employees, principals and others who are in a position to manage or control hazards.

[53] Matters relating to health and safety have been considered under Chapter 16 of this report.

Reserves Act 1977

[54] The general purpose of the Reserves Act 1977 is to provide for the preservation and management of areas for the benefit and enjoyment of the public; ensuring, as far as possible, the survival of all indigenous species of flora and fauna; ensuring, as far as possible, the preservation of access for the public;

providing for the preservation of representative samples of all classes of natural ecosystems and landscape; and promoting the protection of the natural character of the coastal environment and the margins of lakes and rivers.

[55] Under the umbrella of the Reserves Act 1977, the management of the Turitea Reserve is defined in the TRMP. As already noted, PNCC changed the purpose of the reserve to include ‘for the generation of renewable energy in the reserve’.

National Policy Statement on Electricity Transmission 2008

[56] The National Policy Statement (NPS) on Electricity Transmission was gazetted on 13 March 2008 and came into force on 10 April 2008. The objective of the NPS is:

To recognise the national significance of the electricity transmission network by facilitating the operation, maintenance and upgrade of the existing transmission network and the establishment of new transmission resources to meet the needs of present and future generations, while: managing the adverse effects of the network; and managing the adverse effects of other activities on the network.

[57] The objective and policies of the NPS are intended to guide decision makers in drafting plan rules, in making decisions on the notification of the resource consents and in the determination of resource consent applications, and in considering notices of requirement for designations for transmission activities.¹⁵

[58] Consideration of this NPS in relation to the Turitea wind farm has been addressed primarily in Chapter 18 of this report.

National Policy Statement on Renewable Electricity Generation

[59] On 6 September 2008, a **proposed** NPS for Renewable Electricity Generation was publicly notified. This proposed NPS set out an objective and policies to enable the sustainable management of renewable electricity generation under the RMA.

[60] The objective of the proposed NPS was:

To recognise the national significance of renewable electricity generation by promoting the development, upgrading, maintenance and operation of new and existing renewable electricity generation activities, such that 90 per cent of New Zealand’s electricity will be generated from renewable sources by 2025 (based on delivered electricity in an average hydrological year).

¹⁵ National Policy Statement on Electricity Transmission 2008 – Preamble, p2.

[61] In the Draft Report, consideration of this draft NPS was addressed primarily in Chapter 18 of that report.

[62] In its comments on the Draft Report, MRP argued that as the National Policy Statement on Renewable Energy (NPSREG) had become operative prior to the Board's release of this Final Report, we were required to take account of the NPSREG when reaching our final decision on the wind farm proposal. The Board accepted this argument and in a memorandum dated 30 May 2011 (see Appendix 3 to this Final Report) invited all parties to submit responses on the effects of the NPSREG on the wind farm proposal.

[63] The Board's consideration of the effects of the NPSREG on the wind farm proposal, including MRP's submission and all responses received, is discussed in detail in Chapter 18 of this report.

Manawatu-Wanganui Regional Policy Statement

[64] The Manawatu-Wanganui Regional Policy Statement (RPS) was made operative in August 1998. The RPS includes a number of objectives and policies including those relating to renewable energy and greenhouse gas emissions, sustainable land use and water management, natural and cultural features, landscape matters, transport and ecology which are relevant to the proposal.

[65] Consideration of this RPS in relation to the Turitea wind farm has been addressed primarily in Chapter 18 of this report.

The Proposed One Plan

[66] HRC has proposed a single resource management plan combining the RPS and regional plans, namely the Proposed One Plan (POP). The One Plan was notified for public submissions on 31 May 2007 and the decision was released in August 2010. Some appeals on that decision are outstanding.

[67] Consideration of this POP in relation to the Turitea wind farm has been addressed primarily in Chapter 18 of this report.

Regional Plans

[68] There are four operative regional plans that are of relevance to the proposed Turitea wind farm:

- the Manawatu-Wanganui Regional Land and Water Plan;
- the Manawatu-Wanganui Regional Plan for the Beds of Rivers and Lakes;
- the Manawatu-Wanganui Regional Air Plan;
- the Manawatu Catchment Water Quality Regional Plan.

[69] Consideration of these plans in relation to the Turitea wind farm has been addressed primarily in Chapter 18 of this report.

Palmerston North City District Plan

[70] The Palmerston North City District Plan was made operative in December 2000. The entire portion of the proposed wind farm site that falls within the Palmerston North City boundary is zoned Rural.

[71] Consideration of this Palmerston North City District Plan in relation to the Turitea wind farm has been addressed primarily in Chapter 18 of this report.

Tararua District Plan

[72] The Tararua District Plan became operative in March 1998. That portion of the proposed wind farm site that falls within the Tararua District is zoned Rural Management Area.

[73] Consideration of this Tararua District Plan in relation to the Turitea wind farm has been addressed primarily in Chapter 18 of this report.

Notified and Revised Designs: Comparison of Design Criteria

Item	Detail	Revised design criteria	Notified design criteria
Turbines	Maximum turbine locations	105	127
	Maximum number of turbines	104	122
	Maximum number of turbines within the Turitea Reserve	61	62
	Maximum number of turbines on land outside the reserve	43	65
	Maximum turbine height (existing ground level to blade tip)	125m	–
Wind Monitoring Masts	Three monitoring masts	Up to 80m in height	–
Internal Access Road Network	Road width	Up to 10m (during construction) Down to 5m post rehabilitation	–
	New roads within the wind farm site	28km	33km
	Upgraded roads within the wind farm site	24km	–
External Road Network	Road width	7m	–
Substations	Browns Flat 220/33kV Substation		
	Pine Plantation 220/33kV Substation		

Item	Detail	Revised design criteria	Notified design criteria
Internal 220kV Transmission Line	Approximate length	6.1km	—
	Number of structures (lattice)	Up to 20	—
	Steel lattice tower design	Up to 56m in height and 800m spans	—
External 220kV Transmission Line	Approximate length	5.2km	—
	Number of structures (pole)	Up to 22	—
	Monopole design	Up to 45m in height	—
Vegetation Removal (includes clearance for substations and transmission towers)	Total area of exotic and native vegetation clearance (not including grassland and pasture) within wind farm footprint	27ha	28ha
	Total areas of grassland and pasture clearance within wind farm footprint	62ha	95ha
Earthworks	Total site clearance area (roads and platforms)	90ha	118ha
	Topsoil removal	214,000m ³	228,000m ³
	Cut	1,420,000m ³	1,400,000 m ³
	Fill	420,000m ³	660,000m ³
Disposal Sites	Total disposal estimate	1,000,000m ³	740,000m ³
	Total area estimate	33ha	—

Board's Consideration of Comments on Draft Report

[74] The Draft Report was released on 11 February 2011 with the s148(4) RMA-specified 20 working day period for the Board's receipt of comments on this report being extended to 60 working days (to 12 May 2011) at the request of MRP.

[75] The Board also determined by way of memorandum (dated 30 May 2011) that all parties should be given the opportunity to make any final comments (by 20 June 2011) on a number of matters raised in MRP's comments on the Draft Report, in particular, on the NPSREG which had become operative on 13 May 2011. Also requested were any comments on MRP's request to reinstate and/or add up to 12 turbines over and above the number decided on by the Board in its decision. All of this resulted in an extended period between the time of the release of the Draft Report and the publication of this Final Report.

[76] In its submission in reply to MRP's Comments in Response to the Board's Draft Report, PNCC queries whether what MRP 'request' along 'with its comments' and 'Mr Henry's statement' – (Appendix I to MRP's document on the Draft Report), could legitimately be regarded as 'Comments' under s148(4) RMA. It submits that MRP's request at least implicitly acknowledges it exceeds the statutory boundaries where it acknowledges 'this opportunity must extend beyond

the statutory right to make written comments and that Mighty River Power should be allowed to interact with the Board in an iterative manner ...'. PNCC also submits that s148(4) means that the invitation can only be 'to send' the comments to the Board (not reconvene a hearing which is another MRP suggestion). PNCC submits that 'comments' in this context of s148(4) must mean no more than feedback or constructive criticism to polish and refine any rough edges around the decision without altering its substance. PNCC also submits that Mr Henry's statement is not 'evidence' and does not meet the requirements of the Environment Court's Consolidated Practice Note on such matters.

[77] Some of the other responses to MRP's comments on the Draft Report and requests for either a further hearing or an analysis of their document 'on the papers' indicated a degree of alarm that MRP should be allowed an opportunity at this late stage to further 'develop' its proposal.

[78] While we have addressed the substance of that elsewhere, we observe that an application that is called in and referred to a Board of Inquiry is, by that process, limited to a single hearing on the facts as compared to an application that is heard by a local authority at first instance and by the Environment Court at second instance. This streamlining has some benefits for an applicant, though one of the consequences is that the applicant on a called-in application has potentially fewer opportunities to continue to refine its proposal in advance of a final factual determination. MRP's proposal was of course subjected to a significant redesign – at MRP's instigation – during the hearing process, before we came to issue our Draft Report. In light of that, we can well understand the alarm expressed by some submitters in response to MRP's suggestion that it be provided with further hearing opportunities to elaborate on a further redesign. We recognise that consent processing, even on a called-in matter, remains iterative in nature. But the process is one of properly constrained evolution, 'not endless negotiation'.

[79] Accordingly, we did not require MRP to file any further responses on the Board's Memorandum of 30 May 2011, and this Final Report marks the conclusion of our inquiry.

[80] Nevertheless in addressing these vexed issues we turned first of all to the *Concise Oxford English Dictionary*¹⁶ for a definition of 'comment'. That states:

Comment n. 1 a remark expressing an opinion or reaction. >discussion, especially of a critical nature, of an issue or event. >an explanatory note in a book or other written text. **2** archaic a written explanation or commentary. **v.** express an opinion or reaction.

[81] Our focus became 'a discussion, especially of a critical nature of an issue' ... and/or 'the expression of opinion or reaction'. While this interpretation may not have been what the legislation meant after a lengthy inquiry and an extensive Draft Report, we concluded there was enough uncertainty to grant what MRP requested reflecting that its 'request' was more in the nature of a discussion particularly of a critical nature and Mr Henry's second 'statement of evidence'

¹⁶ Tenth Ed. Revised, p286.

could more properly be called an expression of ‘opinion’ reflecting on ‘any aspect’ of the draft report: see s148(4) RMA.

[82] Secondly, we looked again at s41 RMA **Provisions Relating to Hearings** where at s41(1)(b) a number of provisions from the Commission of Inquiry Act 1908 apply, including s4B(1) **Evidence**. Section 4B(1) states that:

... the Commission (Board) ‘may receive as evidence’ any statement, document, information, or matter that in its opinion may assist it to deal effectively with the subject of the inquiry, whether or not it would be admissible in a Court of Law.

[83] We concluded, *prima facie*, that there was enough relevant information on the papers supplied by MRP and anything further that might come in through additional comments or submissions. The parties were given the opportunity to respond only on the issues MRP raised in the Board’s Memorandum dated 30 May 2011.¹⁷

[84] We wish to thank all those who took the time and trouble to respond to the Draft Report and those who responded further to MRP’s Comments on the Draft Report. Most of the comments received on the Draft Report were very helpful and we have incorporated adequate responses where possible. Some which challenged the whole decision we took note of, addressing a number of the matters raised but not changing our conclusion.

[85] Some who revisited previous submissions or comments, introduced new evidence on previous findings, such as noise, or sought relocation of turbines (such as Group C) on which final findings had already been made – we noted but put to one side.

[86] Those who provided responses on what the Board required in its memorandum such as economic viability, reinstatement or addition of turbines, and the NPSREG we refer to under the chapters addressing these issues.

[87] Comments on the POP were not required by the submitters on the basis that, if they had had concerns about its draft provisions when they were first published, they had the opportunity to submit to HRC on the energy provisions of that document or subsequently appeal it. We understand it is still under appeal and therefore its status has not yet changed.

Final Resource Consent Conditions

[88] Final Resource Consent Conditions as approved by the Board are attached at the end of this report.

¹⁷ See Board’s Memorandum In Reply to MRP’s Comments, Appendix 3.

Chapter 2: Turitea's Wind Resource

Introduction

[1] In this chapter we address MRP's wind monitoring programme, the quality and characteristics of the wind resource at *Turitea* compared with other New Zealand sites, its application against International Electrotechnical Commission (IEC) standardised designs for wind turbines and the estimated level of energy production from *Turitea* (as opposed to its installed capacity).

Expert

[2] Mr Philip Wong Too acting for MRP is a senior engineer with Garrad Hassan Pacific Ltd, an international consultancy which provides expert advice on wind energy projects. He has provided specialist wind resource advice for the wind farms at *Tararua*, *Te Apiti*, and *White Hill* as well as for a number outside of New Zealand. His evidence addressed his specialist inputs for the wind monitoring programme, the development of the site layout and the predictions of the energy output.¹

Submitters

[3] In his evidence, Mr Wong Too responded to a number of issues raised by submitters.

[4] Some queried the predicted capacity factor for *Turitea*. Mr Wong Too compared his predicted capacity factor with the actual performance of the nearby *Te Apiti* and *Tararua* wind farms, which have both been operational for some years. Using publically available information, he has found that *Te Apiti* has a capacity factor of about 41% and *Tararua* in the range from 44% to 45%. He notes that these are consistent with the range (43% to 46%) predicted for *Turitea*.

[5] His response to claims by submitters that 'Palmerston North has already done its bit for wind farms' is that wind farms have been built already or consented in a number of other locations in New Zealand including the Wairarapa, Wellington, Otago and Southland. Mr Wong Too's claim tends to be supported by Mrs Melhuish's primary and rebuttal evidence (when this was prepared in May 2009). This shows that the Manawatu share of already operating or under construction wind farm capacity in New Zealand was around 57% with this proportion reducing to 26% if consented but not built farms (including *Motorimu*, since relinquished) were added in.

[6] One submitter queried why it is proposed to place the *Turitea* turbines on ridgelines when at Palm Springs in California they are placed on flat land. In

¹ Wong Too, EIC para 1.6.

response, Mr Wong Too advises that at Palm Springs the wind is squeezed between two mountain ranges, which is similar in his view with the Manawatu where the existing wind farms (and *Turitea*) are located on a 'saddle' between the higher Ruahine Ranges to the north and Tararua Ranges to the south.

Issues

[7] The key issues affecting the wind resource are:

- its characteristics and suitability for a wind farm;
- the forecast capacity factor for the proposed wind farm;
- the placement and grouping of turbines within the wind farm for optimising the wind resource;
- responses to issues raised by submitters.

Evidence and Discussion

Wind Quality and its Characteristics

[8] Wind monitoring commenced in 2006 with data being collected from seven different monitoring locations. Mr Wong Too notes that this monitoring is ongoing and that this will continue until construction commences (on the basis that consent is granted).

[9] Mr Wong Too also describes the key wind parameters as being the average (or mean) hub height wind speed, the turbulence intensity which is a measure of how much the wind speed changes over a 10-minute period, extreme wind speeds being the maximum 10-minute average and the maximum three-second gust expected at the turbine hub height over a 50-year period, the wind shear which is a measure of how quickly the wind speed increases with height and the inflow angle which is a measure of the wind deviation from the horizontal.

[10] With respect to these parameters, he quotes the founder of Garrad Hassan that the 'mean makes the money' while the 'extreme costs the money'. We take it that, for the latter, extreme wind conditions require stronger and therefore more expensive turbines and that during periods of extreme winds it is necessary to close down the turbines with the consequent loss of production.

[11] The energy contained in the wind increases with the cube of the wind speed. Higher turbulence intensities cause uneven and changing loads on the wind turbines leading to the fatigue of component parts. High wind shears can result in increased wind turbine loads as the wind speed at the top of the rotor can be significantly different from the wind speed at the bottom leading to uneven loading on the wind turbine and changes in the loads on the blades during rotation. All of these factors must be taken into account in the design of the turbines.

[12] Mr Wong Too has rated the measured *Turitea* wind parameters against the Standardised Wind Conditions of the IEC 61400-1, 1999. Whilst Mr Wong Too did not provide us with the source of this document, we understand it to be a standard of the IEC, with this standard setting out the design requirements to ensure the engineering integrity of wind turbines for an appropriate level of protection against damage from all hazards during the planned lifetime.

[13] The standard defines conditions for three different classes of wind speed, with the highest being identified as Class 1A. The conditions are turbulence, mean wind speed, extreme 10-minute wind speed, extreme gust wind speed, characteristic turbulence intensity, wind shear and inflow angle.

[14] Mr Wong Too notes that the wind conditions at *Turitea* all fit within the Class 1A limits except for the mean wind speed which exceeds the standard at four out of the six mast monitoring points (12.2 metres per second (m/sec) compared with the standard 10m/sec) and wind shear which is exceeded at one location (wind shear component 0.28 compared with the standard of 0.20).

[15] The witness observes that the measured mean wind speeds at *Turitea* (overall average of over 11m/sec) indicate a resource of exceptional potential, which to his knowledge exceeds those of any wind farm built to date in New Zealand. By way of comparison, his understanding is that the nearby Tatarua wind farm mean wind speed is close to 10m/sec and that internationally only two wind farms have mean speeds exceeding 12m/sec, these being in Costa Rica and Antarctica.

[16] Given the high mean wind speeds, Mr Wong Too points out that site-specific assessments will be required for the design of individual turbines at *Turitea*.

Wind Farm Capacity Factor

[17] Turning to energy production, Mr Wong Too advises that, in estimating the capacity factor for a wind farm, account needs to be taken of losses which can arise from a number of sources including the need to shut down turbines when the wind speed exceeds about 20m/sec; provision for specific conditions such as air density, turbulence and inflow angles; the need to shut down a turbine (or turbines) for maintenance; and transmission losses between the turbines and their connection into the national grid. With due allowances for these sources, the estimated capacity factor for *Turitea*, depending on the type of turbine finally selected would be in the range from about 43% to 46%.

[18] We note that the capacity factor is a measure of the energy that a wind farm actually produces over a year compared with the energy that would be produced for full output without any stops or losses. Mr Wong Too notes that the capacity factor should not be confused with the percentage of time that the wind farm is expected to generate electricity which for *Turitea* is expected to be for about 90% of the time.

Placement and Grouping of Turbines

[19] In her evidence, Mrs Molly Melhuish² an energy consultant engaged by PNCC, identifies *Motorimu* as an excellent example of a modified wind farm proposal in which the adverse effects on special amenity landscapes were modified as part of the consenting process to ensure a 'balance of modulation implicit in the ethic of sustainability'. Mrs Melhuish therefore suggests that smaller closely packed turbines should be used for areas that are some distance from populations and/or which may be screened by intervening ridges. Mr Wong Too has countered that the most visually prominent turbines at *Motorimu* were exposed to the greatest wind resource and that, in his view at least, their removal most likely compromised the commercial viability of that project.

[20] In this context, we were advised part-way through the hearing that the resource consent for *Motorimu* had been surrendered by the receiver for the wind farm. Dr Heffernan,³ chief executive of MRP, advised that this wind farm as consented would be uneconomic for MRP to build and operate.

Board Consideration of Comments on Draft Report

[21] Following a review of the comments received on the Draft Report, the Board has concluded that, apart from the need for one or two minor clarifications identified by MRP, no modifications were required to its Draft Report findings on *Turitea's* wind resource other than to confirm that there is an outstanding wind resource over all of the wind farm site.

Findings

[22] From the evidence of Mr Wong Too, we find that the wind speeds at some of the proposed turbine locations for *Turitea* are very high and that individual assessments will be required for the design of the turbines at these locations.

[23] Overall, there is no disagreement that the proposed wind farm is sited in an area with an outstanding wind resource over all of the wind farm site and that it has the potential to operate with a very high capacity factor of up to 46%.

² Melhuish, EIC para 9.

³ Heffernan, EIC para 1.6.

Chapter 3: Climate Change and Variations in Weather Patterns

Introduction

[1] In this chapter we consider the science of climate change, the global and New Zealand policy responses on climate change, and the role of energy as a climate change mitigation tool. We also consider the effects of natural variations in weather patterns from influences such as El Niño and La Niña.

Submitters

[2] Some submitters, while supporting wind farms in general, did not want the Turitea wind farm in its location. One submitter rejected the notion of climate change altogether, while the landowner submitters gave cogent reasons for their support all of which included climate change issues.

Issues

- [3] The key issues addressed in this chapter are:
- New Zealand's commitment to renewable energy and its role in reducing greenhouse gas emissions;
 - the impact of the natural variability in rainfall on the construction of the proposed wind farm.

Experts

[4] We heard evidence on behalf of MRP from two climate change experts, Professor Ralph Sims and Dr James Salinger, the latter also providing the Board with evidence on natural variations in weather patterns. Professor Sims is currently based with the renewable energy unit of the International Energy Agency, Paris, as a senior energy analyst. Dr Salinger is an honorary research fellow of the School of Geography, Geology and Environmental Science, University of Auckland.

Evidence and Discussion

[5] In a submission to the Board, counsel for PNCC questioned the admissibility of the rebuttal evidence on climate change which had been prepared on behalf of MRP by Professor Sims. The core of counsel's argument was that this was evidence in rebuttal to the evidence of Mrs Melhuish who did not hold herself out to be an expert on climate change. Having heard the arguments of counsel for both PNCC and MRP on this matter, we directed that there was no prejudice arising from Professor Sims's evidence, although it would have been more appropriate if it had been included as evidence-in-chief.

[6] In the event, Professor Sims did not attend the hearing. What follows is a summary of the key issues covered in his evidence:

- global action to reduce greenhouse gas emissions is required as a matter of urgency to prevent dangerous interference in the planet's climate and ecosystems and New Zealand must play its part;
- there is no longer any doubt that anthropogenic activities have caused a rise in greenhouse gases with the key questions being how rapidly the effects on weather patterns will become clearly evident, and what the extent and impact of such changes might be;
- New Zealand has a priority policy to reduce greenhouse gases, with renewable energy a very important part of this policy;
- renewable energy has benefits for employment, health and air pollution in comparison with fossil fuel or nuclear power plants;
- if opportunities are not taken now to build renewable energy plants at an appropriate rate, increasing electricity demand will need to be met through thermal generation with a long-term economic cost for New Zealand (and its tax payers) in having to buy Kyoto credits to cover emissions, potentially for the life of the thermal plants;
- MRP's proposed Turitea wind farm would contribute to meeting New Zealand's climate change goals without requiring economic growth trade-offs.¹

[7] In his evidence,² Dr Salinger addressed a range of matters including estimates of annual, seasonal and high intensity rainfalls, visibility, natural variations in weather patterns, and long-term trends in temperature, rainfall and wind because of climate change.

[8] We have elected to address rainfall issues in a separate chapter of our report because of the direct and substantial impact that rainfall will have on the wind farm primarily during its construction. For this current chapter, then, we consider the balance of the matters raised by Dr Salinger.

[9] He observes that direct observations of visibility were made from Palmerston North airport between 1965 and 1998. There was also an examination of bright sunshine hours in a number of locations near to *Turitea*. From the visibility observations, Dr Salinger has assessed that a very clear environment could be expected to occur for about 15% of the time in autumn, winter and spring and for about 20% of the time during summer.

[10] Global warming from greenhouse gases is expected to result in temperature rises of about 1°C to 2°C for the years 2040 and 2090 respectively, with a resulting slight increase in overall rainfall. There is also the likelihood of an increase in high intensity rainfalls, and westerly wind speeds are also likely to increase by about 10% by 2090.

¹ Sims, RE paras 55–62.

² Salinger, EIC para 6.

[11] Dr Salinger considers the effects of global warming are likely to be overwhelmed by natural weather variations, these being the two natural cycles which operate over a timescale of a number of years, the El Niño-Southern Oscillation (ENSO) and the Interdecadal Pacific Oscillation (IPO).

[12] El Niño events occur about three-to-seven years apart, typically establishing in April or May and persisting for about a year. In these years, New Zealand tends to experience enhanced rainfall in the south and west of the South Island. Conversely, La Niña events bring roughly the opposite changes, usually with enhanced rainfall in the north and east.

[13] The IPO is a Pacific-wide natural fluctuation in the climate which has a positive and a negative phase. The positive phase produces more westerly winds with generally wetter conditions in the west and south while the negative phase has more easterlies and north easterlies over northern New Zealand with increased tropical disturbances.

[14] Dr Salinger considers the natural rainfall variability from these cycles in the Manawatu is not high compared with other regions of New Zealand. In the environs of the wind farm there is a coefficient of variability of 13%, this being a measure of annual rainfall variability. For comparison, the coefficient for Auckland is 19% and for Christchurch, 22%.

[15] It is his view that the differences expected from the natural variability of rainfall during the period proposed for the construction of the wind farm will have only a minimal effect on expected rainfall levels.

[16] In her outline of closing legal submissions, counsel for MRP advised:

In the eleven months since Professor Sims filed his evidence, further data has been released indicating the effects of greenhouse gas emissions on the environment are far greater than previously thought, and that change is occurring faster than previously predicted. As discussed by Dr Salinger, the global rate of increase of fossil fuel CO₂ emissions accelerated three-fold over the last 18 years. In 2008, global CO₂ emissions from fossil fuels were 40% higher than in 1990, and combined global emissions of CO₂ from fossil fuel burning, cement production, and land use change (primarily deforestation) were 27% higher. Moreover, the glacier and ice-cap contributions to sea level rise are generally higher than those previously reported in the 4th Assessment Report of the Intergovernmental Panel on Climate Change. *There is no greater time for countries to be encouraging projects that will decrease the need for the emission of greenhouse gases into the atmosphere, such as the Turitea Wind Farm* [our emphasis].³

[17] And Professor Sims in his rebuttal evidence concluded that:

New Zealand needs to consider seriously every opportunity available to reduce GHG [greenhouse gas] emissions. Mighty River Power's

³ Price, MRP Closing Submissions para 2.8.

proposal for the Turitea wind farm development in the Manawatu is an excellent project in that it would contribute to meeting climate change goals without any associated economic growth trade-off, and with considerable cost management benefits and lower national risk.⁴

Board Consideration of Comments on Draft Report

[18] Following a review of the comments received on the Draft Report, the Board has concluded that no modifications or clarifications are required to its Draft Report findings on *Turitea's* climate change and variations in weather patterns.

Findings

[19] In his evidence, Professor Sims has provided a good overview of climate change. He points out that renewable energy is a key plank in New Zealand's priority policy for reducing greenhouse gas emissions and that *Turitea* would contribute to this. We consider the level of this contribution in more detail in Chapter 4 of our report.

[20] Turning to the weather, we note from Dr Salinger that the effects from climate change will most likely be limited to a small increase in wind speeds later in the life of the wind farm. We assume that this will be factored in by MRP and its suppliers at the time they undertake the design of the turbines.

[21] We also expect MRP and its advisers will have taken into account any effect from the natural variability of rainfall in the determination of the design rainfall levels for the wind farm. In any case, we note Dr Salinger's conclusion that such effects would be minimal.

⁴ Sims, RE para 6(vi).

Chapter 4: The New Zealand Electricity Market, Project Economics and Alternatives

Introduction

[1] In this chapter of our report we consider *Turitea*'s fit with the New Zealand electricity market, its economics and financial viability and the consideration of alternatives.

Submitters

[2] The Board received wide-ranging submissions questioning *Turitea*'s role in the New Zealand energy market. Key amongst the concerns raised in these submissions (and inter-alia also by Mr Brian Leyland, an independent energy consultant) were whether Transpower had the capacity to accommodate the variability in the electricity which would be supplied from *Turitea* and the robustness of MRP's predictive model which forecast better returns for *Turitea* than for other existing wind farms in the Manawatu.

Issues

[3] The issues addressed in this chapter are:

- a brief overview of New Zealand's electricity market and the way it operates;
- MRP's involvement in the market;
- the economics and financial viability of the *Turitea* wind farm from MRP's perspective;
- countervailing views on the economics and viability of the wind farm and its impact on the electricity market;
- *Turitea* compared with other potential wind farms;
- non-market valuations of environmental effects;
- consideration of comments on the Draft Report on economic viability.

Experts

[4] Evidence on these matters was submitted on behalf of MRP by Dr Brent Layton, a senior fellow at the New Zealand Institute of Economic Research, Mr Paul Baker, managing consultant with Energy Link, and Mr Wong Too. Mr Leyland submitted evidence on behalf of TAG and the FOTR and Mrs Melhuish presented evidence on behalf of PNCC.

Evidence and Discussion

New Zealand Electricity Market

[5] We start by providing a brief overview of the New Zealand electricity market, drawing mainly on the evidence of Dr Layton.¹

[6] There is no economically viable way to store electricity in bulk, except by storing water in hydro lakes or stockpiling fuels. Despite recent additions to generating capacity in the North Island, New Zealand remains a long, narrow country, in which major generation and storage capacity is in the South Island, but major consumption loads are concentrated in the North Island. Imbalances between supply and demand within and between regions give rise to the need for large-scale transmission.

[7] There are increasing transmission constraints on parts of the grid, including the ageing inter-island HVDC link, necessitating investments in transmission upgrades or alternatives to transmission. Adding new generation capacity in the lower North Island helps to alleviate these constraints by diversifying the generation mix and deferring the urgency of some transmission upgrades.

[8] The grid is operated by Transpower New Zealand Limited, and since 1996 the buying and selling of wholesale electricity has been done via a pooled market in which generators offer to supply electricity at particular locations, at prices set for half-hour intervals. The system operator has responsibility for ordering dispatch from the stack of generator offers to match demand, and to do so using the sources that satisfy demand at the lowest overall cost, after taking into account expected transmission losses, the requirements for reserve generation, and the physical constraints on the capacity of the transmission grid at each location. Unlike most other electricity markets in the world, the New Zealand wholesale market is designed so that the selection of generation plant takes into account expected transmission losses.

[9] On average, wholesale prices are lowest in the south and highest in the north. As a result of this, and the impact location has on the probability of electricity being dispatched at a given price, generators take into account the economic consequences of transmission losses when making decisions about where to locate generating plants.

MRP's Involvement in the New Zealand Electricity Market

[10] Dr Heffernan,² chief executive of MRP, provided us with an overview of MRP's involvement in the New Zealand electricity market as well as outlining the local and national benefits that he considered would result from the *Turitea* project.

[11] He explained that MRP is the fourth largest electricity generator in New Zealand, on average generating around 15% of the country's current requirements.

¹ Layton, EIC para 1.6.

² Heffernan, EIC para 1.6.

MRP is actively engaged in diversifying its generation portfolio from hydro electric across geothermal and wind as well as in exploration for new natural gas resources. It had selected (at the time of the first hearing) seven prospective sites for wind generation from over 250 potential sites investigated. These sites are located in the Wairarapa, Central North Island, Taranaki Coast, Northland, Wellington, Marlborough and the Manawatu, including *Turitea*. A comprehensive programme of wind monitoring and feasibility investigations is under way at all of these sites.

[12] From a national perspective, Dr Heffernan notes that New Zealand's electricity generation is made up of hydro systems (50–60%), gas and coal (25–35%), and geothermal (10%). The large dependence on hydropower can lead to electricity supply shortfalls during 'dry' years. Increasing the amount of wind power assists with the diversification of generating sources whilst the geographical diversification of generation optimises the potential for harnessing energy under variable weather conditions across the country.

[13] Dr Heffernan is confident the *Turitea* wind farm will provide significant long-term economic and energy efficiency benefits for Palmerston North, the wider Manawatu region, and the nation as a whole. Once operational, the *Turitea* wind farm (with 122 turbines as originally proposed) would generate enough renewable energy to power around 140,000 homes.

Economics of the *Turitea* Wind Farm

[14] In order to set the scene for the evaluation of the economics of the proposed wind farm, we again draw on the evidence of Dr Layton.

[15] MRP's proposed investment in *Turitea* indicates the company regards it as an efficient use of its resources.³ Dr Layton has therefore identified the private benefits from the wind farm would include profits to MRP (and the Government as its shareholder) and its suppliers, as well as the rentals paid by MRP to PNCC and the private landowners who have turbines on their land. Some of the PNCC benefits would also flow on indirectly to PNCC ratepayers. Details of MRP benefits and those of its suppliers as well as the landowner rentals did not form part of the evidence presented at the hearing.

[16] There would be benefits to the local community during both the construction and the operational stages of the development and a substantial benefit from the displacement of thermal generation with the avoidance of greenhouse gas emissions. Dr Layton has provided quantification for each of these benefits as set out below.

[17] Dr Layton has also identified a number of what might be termed 'other benefits' including a restraint on price rises through the displacement by *Turitea* of higher cost generation and also reduced transmission losses through *Turitea* being close to the grid and nearer to the centre of load demand than some other options. He does concede, however, that it would be difficult to quantify the value of the

³ Layton, EIC para 2.4.

generation displacement benefit and that the transmission benefit is likely to be almost indiscernible.

[18] Potential disbenefits identified by Dr Layton which would affect people and communities outside of the wind farm include visual intrusion, land cover and ecological disturbance, and impacts on amenity and recreation. For completeness, we add to this list of disbenefits any loss of quality in the aquatic ecology of the streams in the vicinity of the proposed spoil disposal sites, potential displacement of avian life, the impact of noise on nearby residents, any loss of water quality in the Turitea Reservoirs and the effects on safety and amenity of construction traffic accessing and leaving the wind farm site.

[19] It is Dr Layton's view most of these disbenefits are localised and that they can be avoided, mitigated or remedied to varying degrees in the design and operation of the wind farm. He also notes these effects are not specifically priced although they do have economic value in terms of what the community is prepared to pay to avoid them. He then goes on to say that an economic value is implicit in all consent decisions and the measures taken to avoid, remedy or mitigate effects. If the wind farm is built to operate within specified limits to control these effects, however, then the economic value can be regarded as having been internalised within the design and operational costs of the wind farm, leaving no unaccounted costs for external effects.

[20] Dr Layton provided valuable comment on public perception surveys and how these might be used to evaluate a particular effect. He is sceptical of how the results of such surveys infer the degree to which they value the effect in question. He notes that for *Turitea*, he did not undertake a non-market valuation of the community's willingness to pay because the inherent uncertainties in such surveys would lead to a lack of reliable guidance in weighing up the evidence of such effects.

[21] We now consider those benefits which can be quantified. In doing so, we note that Dr Layton's assessments in his primary and rebuttal evidence were based on the 336MW development as originally proposed by MRP with only brief comment being made in the Assessment of Environmental Effects (AEE) for the redesigned reduced capacity wind farm.

[22] It is Dr Layton's view the proposed wind farm will have a significant positive impact on the local economy,⁴ both during the construction and operational phases with the direct injection of expenditures and jobs as well as the indirect flow-on effects from further spending. Dr Layton estimates the total (direct and indirect) impact on the local economy would be around \$504 million from the construction phase for the 336MW development as originally proposed. The equivalent estimates are not stated in the AEE for the redesigned wind farm.

[23] We observe, however, that it is not just a simple matter of reducing the capital cost in proportion to the capacity of the redesigned wind farm as the cost of the infrastructure is unlikely to be directly proportional to capacity. In our

⁴ Layton, EIC para 2.2.

assessment, the impact of the construction phase on the local economy for the MRP *redesigned* wind farm would, in all probability, be well over \$400 million.

[24] Likewise, we acknowledge that, with our decision to remove further turbines, there will be some further reduction in the economic benefit to the local economy although we have not endeavoured to quantify what this might be.

[25] Dr Layton considers that in normal economic circumstances of nearly full employment, as New Zealand has enjoyed until relatively recently, this local impact would be largely offset by reductions in activity elsewhere in the economy because the labour and other resources would have been employed anyway. In a period of economic downturn, however, some of the labour and other resources would have been idle, so the net impact over the whole economy would be greater and more positive. The actual impact would need to be evaluated at the time the wind farm was built.

[26] In its operational phase, Dr Layton estimated that a 336MW wind farm would inject at least \$1.9 million per year into the local economy from salary and other staff-related costs. A reduction in this amount could be expected for a reduced sized wind farm although this has not been quantified.

[27] In his evidence, he estimates the amount of carbon dioxide that would be displaced by *Turitea* compared with a competing gas- or coal-fired plant. He then moves on to estimate the annual generation costs that would be avoided and the emissions reduction benefit for a 336MW wind farm at *Turitea* operating at utilisations of 45% and 33%, and using a Treasury-sourced range of carbon dioxide values of \$21/tonne and \$33/tonne. These are summarised in the following table.

Turitea 336MW: Annual Generation Costs Avoided and Emissions Reduction Benefit

A: Carbon Dioxide at \$21/tonne

Utilisation	Coal-fired Station			Gas-fired Station		
	Avoided Generation	Emission Reduction	Total	Avoided Generation	Emission Reduction	Total
45%	\$68.9m	\$25m	\$93.9m	\$74.2m	\$10.6m	\$84.8m
33%	\$50.4m	\$18.4m	\$68.8m	\$54.4m	\$7.7m	\$62.1m

B: Carbon Dioxide at \$33/tonne

45%	\$68.9m	\$39.4m	\$108.3m	\$74.2m	\$16.6m	\$90.8m
33%	\$50.4m	\$28.9m	\$79.3m	\$54.4m	\$12.2m	\$66.6m

[28] The AEE for the redesign indicates the estimated value of greenhouse gas benefits would be between \$1.7 million and \$11 million per year for the redesign capacity of 288MW. It is not clear to us how there could be such large reductions in the greenhouse gas benefits in the redesign from those values in the table above for the 336MW wind farm. We were also left a little confused by Dr Layton's evidence where he appears to interchange references to 'carbon dioxide' and 'greenhouse gases'.

[29] Despite these apparent inconsistencies, we acknowledge that, with the redesign (and even with the final design following our deletion of further turbines), the wind farm would contribute towards meeting New Zealand's future projected energy needs under the Kyoto Protocol and its current and likely future international commitments and potential benefits in assisting to address climate change.

[30] In terms of its contribution to the country's electricity needs, *Turitea* as originally designed could be expected to satisfy the requirements of at least one year of electricity growth demand based on New Zealand's historical growth of around 2% per annum.

[31] Dr Layton's conclusions on his economic evaluation of the wind farm are that *Turitea* would harness a free natural resource to create a commodity of value, creating a stream of economic benefits for the owners and the community for years to come. Further, MRP's proposed investment in the wind farm indicates that the company regards it as an efficient use of its resources.⁵ But the critical question for RMA purposes is whether the wind farm would create adverse environmental effects that are so significant as to outweigh the benefits associated with its construction, operation and maintenance.

[32] We will return to this later when we discuss weighing the benefits and disbenefits of the proposed wind farm.

Countervailing Views

[33] We assess here the evidence from Mr Leyland.⁶ In doing so, we note that Mr Leyland was not subject to cross-examination during the hearing as none of the parties elected to call him.

[34] In contrast to the evidence of Dr Layton, Mr Leyland concludes if *Turitea* proceeds it would generate very expensive electricity compared to the alternatives which are available.

[35] Starting with the capital cost, Mr Leyland identifies that its component parts comprise preliminary costs, the overseas manufacture of components and their transport to the site, and on-site infrastructure. He estimated the overall capital cost using publically available information which he quoted as being, for *Project Hayes* (at the time not consented) \$2 billion for 630MW or \$3,175/kW and for *West Wind* \$440 million for an output of 143MW or \$3,100/kW. In his opinion these costs are typical of the current state of the international market. He also references a cost of \$2,500 to \$2,600/kW estimated by PB Associates in 2006 which would have increased to between \$3,750 and \$4,375/kW when applying subsequent changes in the US dollar exchange rate. As future exchange rates are highly uncertain, Mr Layton chose to adopt a capital cost estimated at \$3,500/kW for his analysis which he believes to be conservative.

⁵ Layton, EIC para 2.4.

⁶ Leyland, EIC.

[36] Turning to the costs of operation and maintenance, Mr Leyland accepted the \$11.4 million per year quoted by Dr Layton in his evidence for a 360MW Turitea wind farm as being in line with other information he had reviewed.

[37] Frequency keeping is also a cost, described by Mr Leyland as the minute-by-minute need to exactly match the amount of electricity generated by the national power system to the load demand. To achieve this matching including the variable output of wind generated power, some stations are required to constantly change their output. It is also necessary to manage the power system within a narrow frequency band (nominally 50 Hertz (Hz)) to prevent a system collapse.

[38] Mr Leyland notes for the current make-up of the national power system, frequency-keeping plant is required to manage fluctuations in the range of ± 50 MW. It is his contention that integrating the Manawatu wind farms into the national power system has resulted in the need for increased levels of frequency keeping with the additional costs that this incurs.

[39] In his view, the unpredictability of wind power means that the system operator cannot be confident of the availability of wind power generation for more than an hour or so into the future. He says that it takes longer than an hour to bring one of the large steam turbines at say the Huntly coal-fired power station from 'hot standby' (that is, stopped but warmed up and ready to start) to full load. Mr Leyland contends that this is inefficient and expensive and that the costs involved for this back up are inevitably passed on to consumers.

[40] Taking into account all of the costs for the wind farm, Mr Leyland estimates that a realistic cost of the electricity generated would be about 11.6c/kWh at the point of connection to the grid and approximately 15c/kWh when system-related costs, such as the need for backup, more expensive system operation and additional frequency management, are taken into account.

[41] It is his view that other sources of generation such as hydropower, geothermal and coal- and gas-fired stations can generate electricity at approximately half the cost of *Turitea*.

[42] It is also his opinion that, in order to make the cost of electricity comparable with that of *Turitea*, a carbon dioxide (CO₂) tax of at least \$81/tonne of CO₂ would be needed for a coal-fired power station and at least \$195/tonne for a gas-fired station. Because of the way the New Zealand electricity market works, a tax of even \$81/tonne would almost double the wholesale price of electricity in New Zealand.

[43] In conclusion, it is Mr Leyland's overall opinion that the electricity consumers of New Zealand would be much better off if MRP abandoned this project altogether and, instead, built an equivalent power station based on hydropower, geothermal energy, natural gas or coal because this would save the country and power consumers around \$70 million per annum.

New Zealand's Wind Energy Potential

[44] Drawing on a number of references, Mrs Melhuish⁷ provided background information on New Zealand's potential for wind farm generation.

[45] To start with, she relies on the 2008 Statement of Opportunities, Electricity Commission commissioned report. This divides New Zealand's wind resource outside national parks and cities into three tranches (or categories) with tranche 1 having some 15,000MW of potential generation (or about 40 wind farms the size of *Turitea*), tranche 2 around 13,000MW and tranche 3 around 14,000MW to give an overall total of 42,000MW.

[46] Putting this into context, the actual electricity generation capacity in New Zealand in 2008 listed in the Energy Data File was 9,383MW, of which 321MW was from wind with a total capacity of 1,415MW for wind farms either existing, under construction or consented. She notes that there was a further 2,296MW of capacity in the consent application stage at that time.

[47] Mrs Melhuish quotes a Meridian Energy Report,⁸ which states that the growth in generation capacity since 1995 has exceeded demand growth and that this gap will increase because demand is now forecast to grow slower than the 2% per year growth of the last two decades. She therefore expressed a concern that *Turitea* could in fact represent an actual loss to the New Zealand economy if it was to be built when there was already surplus capacity, as some of its output would need to be sold at less than the cost of its generation.

[48] This led Mrs Melhuish to question whether demand growth could be met by smaller- or medium-scale wind farms. Published information on wind farms which are either consented, seeking consent or planned, indicates sizes ranging from small-scale distributed generation (100kW) to medium size (10MW–50MW) to large (100MW plus), presumably on the basis that all are economically viable to the developer. Whilst 'conventional wisdom says that wind farms enjoy economies of scale', she notes that the New Zealand Energy Strategy has recognised the need for market and regulatory barriers to be removed or reduced to allow smaller-scale 'distributed generation' to be commercially viable. She quotes Policy 5 of the Proposed National Policy Statement for Renewable Electricity Generation which supports '... small and community-scale electricity generation'.

TAG Submission

[49] A submission from TAG⁹ contended that hydropower is the only 'easy' system to handle the variability of electricity supply from wind farms. The submission pointed out that New Zealand's hydropower storage amounts to as little

⁷ Melhuish, EIC, Table 1, Figure 1.

⁸ Meridian Energy, *Options, Choices, Decisions*, 2009 Update, Figure 2. If the data in Figure 2 is averaged over the period since 1996, around 1,250 gigawatt-hour (GWh) of new generation production has been added each year. This additional production is well ahead of average demand growth over the period (around 600–700GWh per year) even after the energy removed by decommissioned plant is accounted for.

⁹ TAG submission, para 44.

as six weeks of electricity demand, compared with say Norway, where there is up to three years' storage. It also goes on to say that the peak times for hydro storage and its associated generation occur in spring which coincides with the peak times of wind power generation. If the lakes are full to overflowing, and hydropower generation is at its peak, this would take precedence over wind power as opposed to the alternative of spilling the excess water in the lakes and using the wind power for generation. The submission quotes Sharman (2005) on the issues of island nations and the constraints that this brings to a country's energy needs. 'Denmark is exporting most of its widely fluctuating wind power to large neighbours while finding other solutions for supply and demand at home. As an 'island' grid based on slow-reacting thermal power stations, Britain may find its comparable wind-power aspirations more difficult to achieve.'

[50] The TAG submission claims that New Zealand, as an island nation, shares many of these same constraints.¹⁰

Dr Layton's Response

[51] In his rebuttal evidence, Dr Layton responds on the fundamental difficulty he sees with the views of Mrs Melhuish and Mr Leyland on alternatives to the *Turitea* proposal. That is that the Board is not a modern-day electricity planning committee deciding from all the possible options what generation capacity is necessary, what kind of generation plants should be built and where they should be put.¹¹

[52] It is his view that the Board's role under the RMA is to decide whether to approve or decline consent based on whether the project's benefits outweigh any adverse environmental effects. Dr Layton states that the Board cannot require that a particular plant be built or dictate when it will be built, other than by setting an upper limit on the term of the consent. Further, the Board cannot reach its conclusion by comparing the proposal before it with some other hypothetical competing proposal. In his view, this is what he believes Mrs Melhuish and Mr Leyland are inviting the Board to do.

[53] Dr Layton also contends Mr Leyland has the intent of implying that the costs of the *Turitea* wind farm have been understated by MRP, that there are numerous other effects that would reduce the apparent benefits presented for the wind farm, and that *Turitea* would be an unduly costly means of generating electricity. Once again, he considers this is asking the Board to deliberate on the best investments for the electricity system rather than focusing on the issues of efficiency and sustainability for the development of a wind farm at *Turitea*.

[54] Dr Layton examined the media-sourced capital costs used by Mr Leyland in his cost evaluation for *Turitea*. It is his opinion that, rather than the \$3,750 to \$4,375/kW range adopted by Mr Leyland, this media information could well indicate a range from \$2,689 to \$5,500/kW, or a 100% variance from low to high across the range. He considers that relying on media-reported cost data without an

¹⁰ TAG submission, para 44.

¹¹ Layton, RE para 15.3.

understanding of its underlying make-up is a distinctly unreliable way of estimating the capital cost for a wind farm at Turitea.

[55] Dr Layton went on to say that the actual capital cost is very sensitive to parameters such as prevailing exchange rates, variations in the global demand for wind farms and fluctuating steel prices. As such, the actual cost can only be determined with any degree of certainty at the time that MRP makes a final commitment to the investment. In this context, we note MRP applied for consents with a 10-year lapse period.

[56] Referring to Mr Leyland's evidence on the cost of frequency keeping and submitter Dr Huffman's oral presentation on Transpower's ability to accept *Turitea*-generated electricity, Dr Layton observes that, even if *Turitea* is not built, normal system fluctuations between load demand and generation will always require the continuous availability of instantaneous reserves. He considers that the incremental frequency-keeping costs required for *Turitea* over and above other system requirements will not be large ... although we note that he does not quantify what these might be.

[57] Dr Layton's estimate of the long-run marginal cost (LRMC) over a 30-year economic life for a 336MW wind farm is \$69/MWh which he compares with the corresponding LRMC for new gas-fired or coal-fired plants of \$86 and \$102 respectively (excluding the costs of emissions from these thermal plants). In justifying the 30 economic year life, Dr Layton notes that even though the *engineering* life of a wind farm might only be 20 years, the *economic* life is most likely to be much longer as there will be strong economic incentives for MRP to extend the engineering life through refits of worn components. Even so, for comparative purposes, the LRMC for a 20-year life compared with a 30-year life would only increase from \$69/MWh to \$77/MWh which would still be less than the cost of a thermal plant.

[58] In his rebuttal evidence, Dr Layton also responded to the TAG submission that the timing of peak hydro generation would coincide with that of peak wind generation. In doing so, he quotes from a New Zealand Institute of Economics Research Report *Exploring Wind-Hydro Correlation* (September, 2008), which provides evidence that the wind speeds in the Manawatu are negatively correlated with electricity prices and positively correlated with lake levels in the North Island. Conversely, Manawatu wind speeds tend to be relatively high when lake levels in the South Island are low. Dr Layton therefore acknowledges some of the observations in the TAG submission are correct although he considers that these concerns are significantly overstated.

[59] Dr Layton agrees with Mrs Melhuish that smaller-scale wind farms can be as economic as large farms. However, it is Dr Layton's view that with such a high-quality wind resource and with the potential to accommodate a large number of turbines over common infrastructure, provided the financial conditions are favourable, then *Turitea* is best suited to the development of a large-scale wind farm.¹²

¹² Layton, EIC para 7.3.

[60] Finally, in response to Mr Leyland, Dr Layton also provides an overview of the way in which price offers from individual generators are ‘stacked’ or ranked for selection in the operation of the wholesale electricity market. The system rules require wind generation to be offered at \$0.01/MWh. This means that, in most instances, wind farms will always generate if wind conditions allow and, in doing so, will displace generators with higher price offers. Dr Layton notes that wind farm investors are fully aware of these offer rules when making their investment decision.

The Impact of the Capital Cost on Electricity Prices

[61] MRP engaged Mr Paul Baker to review and comment on the evidence of Mr Leyland and Mrs Melhuish. We do not see it as being necessary to comment in any detail on the bulk of what Mr Baker has covered in his evidence as for the most part this has been addressed by Dr Layton. Mr Baker does, however, point out that while the capital cost of *Turitea* will have a major impact on the financial return to MRP and on the overall economic benefit of the project, it has no bearing on the cost of the electricity supplied to consumers. This is because, as also explained by Dr Layton, wind farms are required to offer their generation to the electricity market at \$0.01/MWh. This means that, irrespective of its capital cost, *Turitea* will only ever receive the wholesale market price for its output.¹³

Responses from Mr Wong Too

[62] In his rebuttal evidence, Mr Wong Too refers to the Transpower System Performance Reports of December 2006 and 2008 to illustrate the effect of wind generation on frequency keeping. This is in response to the frequency-keeping concerns raised by Mr Leyland and indirectly by a number of submitters. In 2006 the system frequency deviated outside the normal band 3,407 times, whereas in 2008 the deviation was an almost identical 3,415 times. Mr Wong Too makes the point that with wind generation almost doubling from 2006 to 2008, the impact of wind generation on frequency keeping over this period was almost negligible.¹⁴ Mr Wong Too did not provide details of the proportion of wind generation to total generation in each of these years. However, looking forward, we note that as more wind generation comes on stream, its proportion of the overall system generation will increase and place more demand on the amount of back-up generation required for frequency keeping. Mr Wong Too’s rebuttal evidence did not address this future position.

[63] In Chapter 2 of our report, Mr Wong Too also responds to the submitters’ query on the relative energy potential of the various wind farm sites in the Manawatu.

¹³ Baker, EIC para 4.4.

¹⁴ Wong Too, EIC para 3.2.

Board Consideration of Comments on Draft Report on Economic Viability

Introduction

[64] The Board received comments from a range of parties who raised issues about the economic implications of the decision set out in the Draft Report. These included comments from MRP that challenged the adequacy of the Board's consideration of economic aspects of the modified proposal, including whether the proposal remained economically viable. MRP alleged that the Board had made unsupported and uninformed assumptions that the modified proposal would be economically sustainable and accrue similar benefits to those that would have been achieved through the layout as it stood in March 2010 following MRP's redesign.

[65] On economic and viability issues the Board also received comments from PNCC and a number of other submitters.

[66] The other submitters raised a range of matters, including:

- that MRP's request for a further 12 turbines after such a lengthy hearing was entirely prejudiced to any principle of fairness;¹⁵
- that, on the basis of other wind farm decisions, commercial viability is a decision for MRP's boardroom and not the inquiry;¹⁶
- that it is impossible to do a full cost benefit analysis even at one single point in time;¹⁷
- that the two turbine groupings (north and south) might be given different lapse dates 'given they are likely to be economically viable in different timeframes';¹⁸ and
- that MRP's economic analysis had never been offered for public scrutiny.¹⁹

The last of these we do not consider to be true, given Dr Layton's evidence.

[67] The Board considers that the key issues arising from the various comments and submissions relate to:

- the nature of the economic assessment that the Board is to undertake; and the evidence that was provided to the Board on economic viability;
- MRP's claim that the deletion of turbines was unexpected and that the Board made unsupported and uninformed assumptions that its modified proposal would be economically viable.

¹⁵ #87 Mildon, R.

¹⁶ #9 Huatau Marae, paras 16–17.

¹⁷ #92 Adams T.

¹⁸ #686 Mildon A, para 6.

¹⁹ #325 and 236, Stitchbury, paras 3, 6; #579 Harker, p2; #258 Adams J, para 12; #569 and 570 Levin.

Discussion

[68] ‘Economic wellbeing’ along with social and cultural wellbeing are among the matters touched upon in s5(2) RMA. Under s7(b), the ‘efficient use and development’ of resources is also a matter to which we are to have particular regard. These provide a distinct economic complexion to the RMA.

[69] Each of these matters was addressed by the Board in detail at Chapter 19 of its Draft Report at Section 7 ‘Discussions and Findings’ which relates to Part 2 matters.²⁰

[70] We heard relevant evidence from MRP’s project manager, Mr Henry, who identified at the first part of the hearing that MRP sought to optimise the wind farm layout to maximise the use of what is accepted as a world-class wind resource.²¹ He added that MRP was not taking an ‘all or nothing’ approach, and by way of partial explanation for that he discussed some of the interrelated complexities between the design and the economics of the project that mean, ‘... it is not simply a matter of how many turbines are deleted’. He put it that, with the loss of any turbines, MRP would, ‘... begin to lose traction on the economics of the project’.²²

[71] Despite this potential loss of traction MRP was not prepared to take an ‘all or nothing’ approach.

[72] This remained consistent as the hearing process unfolded. In presenting the redesign, counsel for MRP said that it was not possible to state with any certainty the specific number of turbine zones that must be consented for the project to remain an economic proposition (for MRP).²³

[73] Then, in response to our Draft Report, a further statement from Mr Henry was provided. It states:

Based on the proposal as amended by the Board in its draft report, the northern part of the wind farm may become economically viable in the future, but with a likely extended timeframe of up to 5 years relative to the project as it stood following Mighty River Power’s 2010 redesign. Presently, Mighty River Power is not confident that the southern part of the wind farm will become economically viable within the 10 year lapse period and it may accordingly need to seek appropriate extensions in due course.

Allowing the further turbines which Mighty River Power is now seeking, especially those along the water catchment access road, makes the project *more* economically sustainable. The nature of the newly proposed revision (MRP’s), through repositioning, infill placement and return of turbines immediately adjacent to those identified as being acceptable by the Board, means that little additional infrastructure and earthworking effort would be required. In practical terms, this improves the project

²⁰ Draft Report, Chapter 19, *Part 2 Matters*, paras 12–15.

²¹ Henry, NOE 778.

²² Henry, Statement, Doc 16, *Response to Matters Raised to Date*, 6.8.09.

²³ Counsel for MRP, Submissions on re-commencement of hearing on redesign, para 4.2.

economics as the fixed costs are shared proportionally with a greater number of turbines. There is minimal additional impact in terms of environmental effects [our emphasis].²⁴

[74] In relation to the lapse periods, it was MRP that requested the 10-year lapse period as opposed to the standard five-year period covered under s125 RMA. This lapse period was agreed to by the Board in its Draft Report, and it was and still is our conclusion that this is a more than realistic period to accommodate the reasons advanced by MRP in its request for a 10-year period, irrespective of our decision to remove the turbines identified in our Draft Report.

[75] Despite his obvious awareness of our inclination to amend the proposal by deletion of some of the turbine sites, Mr Henry's further statement is still not drawing a final line as to what is viable and what is not. Rather, if further turbines are added (as requested by MRP) he says that the project will become more sustainable.

[76] It is not entirely clear what Mr Henry means when he refers to sustainability in this way, but his use of that language is in common with MRP's response to the Draft Report – where, for example, MRP states that its revised layout has been prepared to 'improve the project's sustainability'. In this sense the sustainability referred to seems to differ from the sustainability with which s5 is concerned, and we think the use of that language is unhelpful. From the content of the MRP documents (including Mr Henry's statement) we surmise viability, rather than sustainability in the broader sense, is the topic actually under discussion.

[77] In response to matters raised by Mr Henry, the PNCC provided to us examples of viability being a moveable feast throughout MRP's case. PNCC's comments go on to observe that the lack of definitive viability figures is not surprising given the variables involved.²⁵

[78] Other evidence relevant to viability came from Dr Heffernan. He signalled that investment in energy is for long-term gain and that economic conditions in which the company operates are very important at the time it invests in a project '[w]hat is absolutely important is what the costs of the equipment is – it is largely a high capital cost'.²⁶

[79] We also heard evidence from Mr Wong Too that all of the *Turitea* site has an exceptional wind resource (and not just Back Ridge (South)), as we have noted in Chapter 2 of our Draft Report (and this Final Report). In fact, in some locations the very high mean wind speeds will require site-specific assessments for the turbine designs at some locations.²⁷

[80] Finally, Dr Layton, as the economic expert for MRP, reflects some of the earlier MRP evidence²⁸ and is recorded earlier in this chapter as stating that the actual capital cost is very sensitive to parameters such as prevailing exchange rates,

²⁴ Henry, Second Statement, Appendix 1, paras 2.5–2.6.

²⁵ Maassen, Counsel for PNCC *Response to Board's Minute Dated 30 May 2011*, para 34.

²⁶ Heffernan, NOE 46.

²⁷ Chapter 2, paras 14–16.

²⁸ Layton, EIC and RE.

variations in the global demand for wind farms and fluctuating steel prices. As such, ‘the actual cost can only be determined with any degree of certainty at the time that MRP makes a final commitment to the investment’.

[81] The critical question for him and for RMA purposes is whether *Turitea* would create adverse effects that are so significant as to outweigh the benefits associated with its construction, operation and maintenance. In this context, we noted MRP applied for consents with a 10-year lapse period, giving the company a decade in which to choose the best time for investment, and that can only be known to MRP.

[82] Dr Layton acknowledged he did not engage in a detailed cost benefit analysis of both the benefits and externalities of the proposal. He said that ‘in most cost benefit analysis you do not end up with some of the more intangible items with a number. The question then becomes, is it likely that the benefits or the costs would outweigh any likely size of those if you could quantify them. Not everything in the world, unfortunately, ends up being quantifiable’. In the end he acknowledged it always becomes a matter of judgement even in terms of models.²⁹

[83] The difficulties of quantifying some of the costs associated with development of this type are well recognised. In *Meridian Energy v Central Otago District Council and Others* the High Court put it this way:³⁰

The problem is that where all the benefits and costs are not the subject of market transactions there is no readily quantifiable financial sum reflecting the demand or price to be paid for such benefits or the imposition of detriments. To put dollars on them requires some sort of imputing of demand. Sometimes this can be achieved by way of surveys: ‘How much would you pay to visit a national park?’

Sometimes it is not possible to quantify such items in dollar terms.

[84] Despite the role of economics, the RMA requires a range of values to be considered, some of which will simply elude quantitative analysis. We concur with the High Court³¹ that it would be difficult, if not impossible, to express some of the criteria within Part 2 of the RMA in terms of quantitative values. As that court observes, it is no criticism of the process that it requires particular regard to be had to some matters that may only be capable of expression in qualitative, as opposed to quantitative, terms.³²

[85] In addition to MRP’s evidence and submissions pertaining to viability, we also heard a range of views from other parties. Some sought no wind farm at all on the site; others wanted a small number of turbines to the north of the site based on the existing expert landscape evidence; and others were conflicted about the impact of the wind farm on the southern part of the site.³³

²⁹ Layton, NOE 102.

³⁰ [2011] 1 NZLR 482 at 514.

³¹ Ibid at 512.

³² Ibid at 513–514.

³³ See Bray, Exhibit 35.

Overall Findings

[86] We consider here our findings on the economics and economic viability of the wind farm, how it would fit within the New Zealand electricity market and whether we should be considering alternatives.

[87] We accept the evidence of Mrs Melhuish and Dr Layton that wind farms can be economic over a range of sizes. Further, for *Turitea*, we agree with Dr Layton that it is not surprising from a purely commercial perspective that MRP would seek to maximise the size of the wind farm. *Turitea* has a very high-quality wind resource, it is located very close to the national grid and it is also relatively close to the centre(s) of electricity demand.

[88] Irrespective of the weight we might or might not have given to Mr Leyland's evidence had he been subject to cross-examination, we prefer the overall views of Dr Layton and Mr Baker on the costings for the project. These are that the *cost of the wind farm* is primarily an issue for MRP and that, independent of this cost, the *cost to electricity consumers* is protected through the New Zealand electricity market pricing structure for the purchase of wind generated power.

[89] It is also our opinion that endeavouring to undertake a comprehensive economic analysis of all of the potential benefits and disbenefits of the wind farm would be largely a theoretical exercise with individual economic valuations, by necessity, requiring a wide range of variables to be considered to cover uncertainties. When aggregated, this range would then result in an even wider range of possible outcomes which would lack any robustness in assisting us with any meaningful decision making.

[90] We accept Dr Layton's evidence that an economic value is implicit in all consent decisions and the measures taken to avoid, remedy or mitigate effects; that if the wind farm is built to operate within specified limits to control these effects, then the economic value can be regarded as having been internalised within the design and operational costs of the wind farm with no unaccounted external effects; and that the Board's role under the RMA is to decide on the consent application based on its assessment as to whether the project's benefits outweigh its adverse environmental effects.

[91] Our approach, then, has been to undertake detailed analyses of each of the potential environmental disbenefits and then to decide whether each can be avoided, mitigated or remedied to an acceptable degree in the design and operation of the wind farm. The analysis and our conclusions for each are set out in separate chapters of this report.

[92] MRP contends that the NPSREG (Policy B) requires decision makers to ensure, as far as possible, that renewable energy projects for which they grant consent will be viable. We do not agree that the NPSREG elevates questions of economic viability in that way. There is no directive in the NPSREG for a decision maker to have particular regard to economic viability or the deliberate promotion of that issue, least of all as a matter that might be accorded greater weight than landscape or other amenity values.

[93] Based on the evidence (which was required to be pre-read) and site visits which were carried out in advance of the hearing, we came to the initial conclusion³⁴ that some turbines in the Turitea environment would be appropriate. How many turbines and where remained inconclusive until careful scrutiny of the extensive evidence had been undertaken. ‘Appropriateness’, however, or otherwise, took into account the Board’s knowledge that ‘the wind farm relied on a common transmission line that connected two substations to the outside world’, and that ‘the internal electrical reticulation from the turbines back to the substation required integrated design’.³⁵

[94] In undertaking its overall evaluation of the wind farm, the Board was well aware that the fixed costs of development needed to be assessed over all of the wind turbines. This was a key factor we took account of in our decision to allow the retention of the turbines on Hardings Park Ridge and in consenting the two major realignments of the water catchment access road which require substantial clearances of highly valued indigenous vegetation.

[95] In the Draft Report we set out the environmental bottom lines in terms of terrestrial ecology, amenity and landscape issues and these have required the removal of additional turbines over and above those removed by MRP in the redesign. MRP chose to expand its original proposal of 60 turbines for the wind farm over a very large area for commercial and practical reasons – practical because of a pre-existing road and wind resource. It also chose particularly large turbines which required 200 metre spacing between each turbine for their particular energy capabilities and for the avoidance of difficulties such as wind shear. In other words, it met the requirements of s7(b) RMA. The spacing was an environmental side benefit for the avian population, but the intrusion of such large turbines into the environmental and social values identified in the inquiry, and over such an expansive area, meant that some placements could not be sustainably managed in terms of the proximity to the residents of the foothill communities and Outstanding Natural Features (ONFs) and Outstanding Natural Landscapes (ONLs) issues in the Turitea Reserve. That was a matter of weighting and subsequent judgement for the Board after hearing the evidence and we do not waver from it.

[96] Our awareness of viability issues was reflected in Chapter 19 of our Draft Report. That is why the location of every turbine was addressed individually.³⁶

[97] We have reviewed the evidence, submissions and comments on economic viability from all parties, all of which we have considered in reaching our decision. We are satisfied that we have appropriately weighed all costs and benefits (including intangibles), and the weighting of those many and varied matters has not changed. Having heard the evidence of all of the landscape witnesses as well as a number of residential submitters, deletion of turbines, even central ones, was a live issue throughout the proceedings. The deletion of the turbines we have identified could not have been unforeseen, otherwise counsel for MRP would not have raised it in her final submission.

³⁴ Draft Report, Chapter 19, para 29.

³⁵ Henry, Statement, DOC16, *Response to Matters Raised to Date*, 6.8.09.

³⁶ Draft Report, Chapter 19, para 12.

[98] In Chapter 19, we set out our findings of our overall Part 2 RMA evaluation of the project's benefits and disbenefits. These identify that changes in the economics of the project are a matter properly for MRP, not the Board, which has much wider considerations to evaluate. The 'cost' of the turbines that we have deleted was such as to require their removal, regardless of the viability of the remaining turbines as a project for MRP.

[99] Finally, we record our agreement with Dr Layton that the Board is not a modern-day electricity planning committee deciding from all possible options what generation capacity is necessary; what kind of generation plants should be built; when a particular plant should be built (other than by setting an upper limit on the term of the consent); and that our responsibilities do not include reaching a conclusion by comparing the proposal before it with some other hypothetical competing proposal.

Chapter 5: Wind Farm Infrastructure

Introduction

[1] In this chapter of our report, we summarise the key elements of the wind farm infrastructure drawing largely on information contained in the AEE report for the wind farm as originally proposed¹ and the AEE report for the revised design as well as from the engineering evidence of a number of the expert witnesses.² In doing so we note that while the basic engineering parameters will remain the same (eg, site geology, road geometry and construction techniques), measures such as the volume of earthworks, the lengths of turbine access roads and the extent of vegetation clearances required will have reduced significantly as a result of the Board's decision to remove further turbines.

Submitters

[2] Dr Alan Palmer, who appeared for the FOTR and TAG, is a senior lecturer in soil and earth sciences at Massey University. He opposed the proposal in its entirety on the basis of the perceived negative impacts from soil erosion on the water quality of the *Turitea* catchment and unsuitable geology for both the turbine sites and the access roading. Dr Palmer identifies that geology similar to the Turitea Reserve has already been encountered in the wind farms to the north of the site but unlike the characteristics of these other sites *Turitea* is very rugged. In his opinion, the geologically sheared nature of the site makes it likely that roading and the eastern and western turbine platforms will strike variable conditions and instability that might require more excavation than planned. He cited a report on issues around the excavations for the Turitea water supply dam constructed in 1953–1956. Dr Palmer also considered the construction of the roads and turbine platform will be major undertakings in this terrain and that sediment from the earthworks (which he considers MRP seriously understates) will end up in the headwaters of the catchments of the water storage dams or the streams to the east.³

Issues

- [3] Issues for the wind farm infrastructure include:
- the horizontal and vertical alignments required for the access roads to accommodate large construction cranes and the transport of very long turbine components;
 - the methods for supporting and stabilising slopes associated with the construction of the access roads;

¹ MRP, *Turitea Wind Farm Assessment of Environmental Effects*, August 2008.

² MRP, *Turitea Wind Farm Assessment of Environmental Effects*, Turitea Wind Farm Redesign, February 2010.

³ Palmer, EIC paras 10–20.

- the general interface between the geology of the site, its stability and the planned civil engineering works;
- the routing and construction of the internal transmission line(s);
- the manufacture of concrete;
- the construction of the turbine foundations.

[4] In addition, a range of more specific issues arising from the construction (such as vegetation clearances, sedimentation control and the disposal of surplus earthworks) are dealt with in other chapters of this report.

Experts

[5] Experts engaged by MRP for the development and design of the wind farm infrastructure were Mr Chris James, Beca Consultant's lead wind farm civil engineering designer; Mr Graham Levy, Beca's technical director, Water Resources Engineering; Mr Gavin Alexander, Beca's technical director, Geotechnical Engineering; Mr Scott Vaughan, a director of Riley Consultants and a specialist in geotechnical engineering; and Mr Anthony Parsons, a civil engineer with over 40 years' international experience of working on major civil engineering projects. In addition, Mr Nigel Mark-Brown was engaged by the Board to prepare the s42A Report.

Evidence and Discussion

Roading

[6] The access roads as originally proposed were 10 metres wide to accommodate the large turbine erection crane(s) proposed at the time the AEE was prepared. As discussed below, this width was reduced following MRP's positive response to the Board's request in the Draft Report. Even though the crane(s) will be capable of traversing gradients of 17.6%, it is intended that for the most part the road gradients will be limited to 14%. Notwithstanding, in some locations, gradients of over 14% will be adopted to minimise the volume of earthworks required and the associated vegetation clearance. These steeper gradients will require special surface treatments to provide for vehicle traction. Roads not required for crane transport will be limited in width to 6 to 7 metres.

[7] The horizontal and vertical alignments of the access roads are dictated by the need to accommodate the transport of the turbine blades which could be up to 45 metres long. Cut batters are proposed with slopes of 1 horizontal to 4 vertical in line with the existing road batters within the Turitea Reserve and the adjacent farms. Fill batters are proposed with slopes of 2 horizontal to 1 vertical or, if possible, at flatter gradients especially in farmland to facilitate their use for farming purposes. The narrow ridgeline between turbines (WT) 27 and 34 will require the road formation to be supported with retention structures, most likely large gabion baskets. There are also two new substantial realignments in this area to by-pass narrow winding sections of the existing water catchment road.

[8] The depth of the road pavements is expected to be between 150mm–200mm depending on the condition of the underlying sub-grade rock with the depth at any particular location to be determined during detailed design and construction. Given the expected variability of the greywacke excavated over the wind farm site, and the need for high-quality pavements to carry the heavy loads to be transported, it is most likely that the pavements will need to be formed with imported material.

Substations

[9] Two substations are proposed, one in the south west at Browns Flat and the other within the pine plantation at the north east. These substations are required for the conversion of the electricity from the 33kV produced by the turbines to 220kV. The substations, which will be limited in height to 8 metres, will incorporate a control room, a switch room, a workshop, a storeroom and a staff room with amenities. Each substation is to be provided with a septic tank, with the treated wastes being disposed of outside of the water supply catchment.

Transmission

[10] The power generated by an individual turbine will be transmitted to the nearest substation through a 33kV cable. Where feasible and for the most part, all 33kV cables will be buried along access roads. Some of these cables may also need to be located above ground on single circuit steel monopoles, for example, where there is insufficient room for buried cables within a roadway or where a more direct route to substations can be achieved. We were given no details as to where such aerial cables might be located.

[11] A 220kV transmission line about 6.1 kilometres long with up to 20 support structures is proposed to link the two substations. Under MRP's original design, this followed a line from the pine plantation substation near WT15, along the water catchment access road to WT21, across the Turitea Valley to WT64 and then through Browns Flat to the Browns Flat Substation. The AEE noted that Wildlands Consultants had inspected this route and confirmed that it avoids all tawa forest. The support structures for this transmission line will be lattice towers up to 56 metres high with a maximum span between the towers of 840 metres. The foundations for the towers will have a typical footprint of 12 metres by 12 metres. In addition, lay-down areas would extend this area to a total of about 15 metres by 15 metres.

[12] The six tower sites within the upper valleys of the Turitea Reserve will be cleared by hand to minimise the impact on the surrounding vegetation. In addition, all components for these towers including the reinforcement and concrete for the foundations as well as for the towers themselves will be helicoptered in to avoid the need for construction access tracks.

[13] As well as the internal 220kV line, a second 220kV line will be required to transmit the electricity from the Browns Flat Substation to connect with the

national grid at the Transpower Linton Substation. This line will be supported on 22 monopoles up to 45 metres high.

[14] We were told that MRP had reached agreements with all of the affected landowners for the construction of this transmission line.

Geological, Geotechnical, Foundation and Earthworks Issues

[15] The AEE for the revised design notes that about 1 million cubic metres of surplus earthworks material will need to be disposed of over a number of sites with a combined area of about 33 hectares all located outside the Turitea water catchment. This volume will have reduced significantly as a result of the Board decision to delete a number of turbines within the reserve, particularly those on Game Ridge with its extended access roads.

[16] The assessment of the environmental effects arising from these soil disposal sites is addressed in some detail in Chapter 9.⁴

[17] A preliminary investigation undertaken in 2006 by Beca Consultants has identified that the wind farm site is underlain by either highly variable greywacke (generally alternating sequences of sandstone and mudstone) or Browns Flat alluvium. The surface materials comprise both clay and silt as well as sandy gravels. The majority of the fill material for the roads and turbine platforms will be sourced from the greywacke deposits. Rock excavation will require a mix of techniques including digging with a large excavator, ripping with a tine attached to a large bulldozer, and in some localised areas, hydraulic breaking or small-scale controlled blasting.

[18] Where the surface of the underlying greywacke is at a depth of less than 6 metres it is proposed to support the turbines on spread footings founded on the greywacke. For greywacke depths in excess of 6 metres, the turbines will be supported on bored piles drilled into the underlying rock. The foundation option chosen for a particular turbine will be determined during the detailed design phase.

[19] Indicatively, the depth of the concrete foundation is expected to vary from about 2.5 metres at the centre to about 1.5 metres deep at the outer edge, within an overall excavation depth of about 3 metres below ground level. The footings are expected to be around 18 metres in diameter. At the centre, a 4 metre diameter plinth will extend about 200mm above ground level, with the base of the turbine tower being founded on this plinth. With these dimensions, the ground cover over the footing would be a minimum of about 0.5 metres at the centre increasing to about 1.5 metres at the outer edge.

[20] Mr Alexander for MRP provided evidence on the preliminary geotechnical investigations which had been undertaken so far and the investigations proposed for the detailed design and construction phase of the project. He acknowledged Dr Palmer's assessment of the local geology, namely the heavily sheared nature of

⁴ MRP, *Turitea Wind Farm Assessment of Environmental Effects*, Turitea Wind Farm Redesign, February 2010.

the rock, and rugged terrain that characterises parts of the sites. And while he acknowledges that care will be required when MRP excavates higher cut faces, he considers Dr Palmer's references to the Turitea dam construction are irrelevant because dams require much more rigorous engineering than the wind farm requires. While acknowledging more excavation will be required in some localised areas, it is Mr Alexander's view that the resulting volumes would not be high.

[21] Mr Alexander also described:

- earthquake hazards and faulting where he had identified two fault lines, but, as both were outside the project area, fault rupture is not expected to be an issue;
- preventable measures to mitigate any slope instability include avoiding steeper slopes on which to put turbines and roads, trimming back steep slopes to provide stable profiles, installing drainage to reduce water pressure and/or constructing localised retaining structures;
- the potential for liquefaction (where loose or saturated sandy soils begin to behave like liquid), which in Mr Alexander's view is restricted to the central areas of Browns Flat away from the turbine locations, with a very low probability of occurrence.
- the further geotechnical work which would be undertaken by MRP during the detailed design stage if consent were to be granted.⁵

[22] In contrast to Dr Palmer's concerns, Mr Alexander considers competent weathered greywacke material identified in the drill bores would be ideal for the construction of structural fills which will be keyed into sound material at the toe and benched into the underlying ground (after the topsoil has been stripped). In critical areas such as the lower Turitea Reserve, standards for fill are to be higher and hence margins against slope instability will be too.

[23] When questioned by counsel, Dr Palmer admitted that the cuts made for lower Turitea dam upgrading work are very stable 30 years on and he agreed the rest of the cuts apart from the hairpin bend on the proposed water catchment access road would not be high. Thus, he agreed, they would be treated in engineering terms similar to the standard way in which the council's roading engineers build and maintain roads in the district.⁶

Peer Reviews

[24] Mr Vaughan for MRP provided a peer review on the preliminary geotechnical report, the construction effects report and the draft construction environmental management plan. Of relevance to this inquiry, Mr Vaughan advised he had prepared aspects of the geotechnical assessments of access track and turbine platform stability and sediment and stormwater management for Stage 3 of the *Tararua* wind farm development and provided periodic geotechnical

⁵ Alexander, RE paras 19–24.

⁶ Palmer, NOE 401.

reviews of various aspects of its construction. For the *Mahinerangi* wind farm, he directed and provided input into that project's geotechnical assessment. And in 1994 he was responsible for undertaking the geotechnical investigations for the lower Turitea dam upgrade. He had also provided a review of the evidence of Messrs James, Levy, Alexander and Parsons.

[25] Based on his experience on the nearby wind farms and the evidence of Mr Alexander and related discussions, Mr Vaughan was satisfied that:

- while Mr Alexander's assessment had revealed evidence of historical moderate to large-scale instability, those were all in areas away from the turbine sites, road alignment and fill areas;
- while there are a number of shallow-seated soil-creep slope movements, this does not present a major hazard to the wind farm development, as the roads and turbine locations are located along the steep slopes that flank many of the ridgelines and the spur features;
- detailed geotechnical investigations are required (and planned for by MRP) for each of the turbine platforms, and if any turbine zones cannot be moved to avoid potential instability, engineering stabilisation options are available.⁷

[26] In his summary of potential water-related construction effects, Mr Mark-Brown was most concerned that slope instability caused or triggered by MRP's proposed construction works could have an adverse effect on water quality, water courses and streams, or the reservoirs. Ultimately, however, he concluded that the proposed works would not trigger or cause slope instability which would impact on water quality. He came to this conclusion after reviewing the rebuttal evidence of Mr Alexander and Mr Vaughan.⁸

[27] Mr Parsons provided a peer review of specific aspects of the civil engineering design, construction and environmental management evidence of Mr James and Mr Levy.

[28] Mr Parsons identified that, because of the challenging nature of the terrain and PNCC's contractual arrangements,⁹ MRP considered it was necessary to undertake extensive detailed evaluation and design development to confirm the viability of the project. Mr Parsons endorsed Mr James' conclusions that:

- the existing water catchment access road can be upgraded with shallow cuts and minimal filling;
- the two exceptions to this are the access to the saddle section which will require relatively substantial cuts and fills supported by gabion rock-filled baskets as retainers and roading in the farmland in the north-eastern section, which will also, due to the contours, require substantial cuts and fills of weathered greywacke;

⁷ Vaughan, EIC para 6.13.

⁸ Mark-Brown, s42A Report, p8.

⁹ Parsons, RE para 2.2.

- dropouts, if they occur, are likely to consist of small volumes of broken rock particles which are easily cleared up as they occur.

[29] Mr Parsons agrees with Mr Levy, as a result of his assessment, that it is perfectly feasible to construct and operate the wind farm in this terrain.¹⁰

Board Requests in Draft Report

[30] In its Draft Report, the Board noted from Condition 8 at page 21 of the 28 March 2010 Resource Consent Conditions that a Site Environmental Management Plan (SEMP) was to be prepared specifically for the cross-valley transmission. We requested MRP to confirm that this condition include a commitment from MRP to construct the six transmission tower sites by hand to minimise the impact on the surrounding vegetation and to use helicopters for the delivery of all the tower components.

[31] We also had particular concern over the amount of indigenous vegetation clearance which would be required for the widening and construction of the access roads in the Turitea Reserve. We noted from Mr Stephen Brown's May 2008 report¹¹ that it may be possible to use narrow-tracked cranes for turbine erection which would allow a narrower carriageway profile. We therefore requested MRP to investigate the feasibility of reducing the road widths from the 10 metres proposed to say 6 metres over all lengths where this is possible. In making this request we acknowledged that widths in excess of 6 metres may well be required on tighter curves to accommodate the transport of the 45-metre long turbine blades.

[32] In Chapter 13 of the Draft Report, we also requested MRP to reroute the transmission line so that it avoided breaking the skyline of Back Ridge (South).

Board Consideration of Comments on Draft Report

[33] In its comments on the Draft Report, MRP responded positively on each of the three requests.

[34] With respect to the six cross-valley transmission towers, hand construction of the bases of these towers and the use of helicopters for the delivery of tower components have been confirmed in Condition 12 of Schedule 1 of the Resource Consent Conditions.

[35] MRP also confirmed that since it had produced its original evidence, narrow-track cranes have become available and that while these can operate on a 6-metre wide road, such a width would be a severe restriction on traffic flows during earthworks activities and also during the transport of the turbine components. MRP has therefore proposed a 7.5-metre width with the provision of passing bays at regular intervals. The Board accepts that this proposal is a reasonable compromise and will result in significant reductions for both

¹⁰ Parsons, RE para 3.1.

¹¹ Turitea Wind Farm *Assessment of Landscape and Amenity Effects*, 2008, p10.

earthworks volumes and in the extent of the vegetation clearances which will be required.

[36] The Board also notes from MRP's comments on the Draft Report that the reduction in earthworks will allow the number of soil disposal sites to be reduced to eight locations.

[37] MRP has also rerouted the cross-valley transmission line. Details of the revised alignment are discussed in Chapter 12.

Findings

[38] From a purely technical perspective, based on the evidence we heard, the proposed construction, operation and maintenance of the wind farm appear to us to be based on well proven technologies and methodologies. Whilst *Turitea* is to be located in what will often be a particularly harsh environment, other wind farms have been constructed in similarly harsh environments. Correspondingly, we heard no reason to suggest that *Turitea* could not be successfully constructed, operated and maintained.

[39] Notwithstanding, there are many potential negative environmental effects which could well arise from the construction of the wind farm particularly as much of this construction is to be undertaken within the *Turitea* Reserve which contains the two main reservoirs for Palmerston North's water supply. Our assessments of these effects and their proposed mitigation are addressed in detail in other chapters of our report.

[40] Following the Board's acceptance of MRP's proposals to reduce the widths of the access roads from 10 metres to 7.5 metres with passing bays and the number of spoil disposal sites, MRP has included details of these decisions in the final set of Resource Consent Conditions approved by the Board.

[41] MRP's evidence is that all of the turbine components would need to be brought onto the site via the north-eastern access off the Pahiatua Track. This will be necessary as the very tight alignments of Kahuterawa Road and Greens Road preclude the use of the south-western access for this purpose.

[42] As set out in other chapters of this report, our analysis has led us to conclude that a significant number of turbines must be removed from the southern end of the wind farm within the reserve (over and above those taken out in the MRP redesign). In reaching this decision, we wish to record that we have been very much aware that the upgrading of the water catchment access road over its full length will still be required for the transport of turbine components to the remaining turbine zones at the south-western end.

[43] We also note reducing the number of turbines and their associated access roads will result in a significant reduction in the volume of surplus soil to be disposed of. This in turn should allow a reduction in the number of proposed spoil disposal sites. We would anticipate that the least environmentally sensitive sites would be used first.

Chapter 6: Rainfall

Introduction

[1] The proposed wind farm is located on the crest of the northern Taranaki Range, south east of Palmerston North. The north-east to south-west orientation of the range, which is approximately at right angles to the prevailing winds, is not only in an area of high wind energy potential but also of high rainfall.

[2] Whilst rainfall as such has no bearing on the operation of a wind turbine generator, it has the potential to produce a range of negative effects particularly during construction. For example, in a heavy rainstorm, if a sufficient volume of water combined with sediment enters a stream course, there could be the mobilisation of in-stream sediments, resulting in stream flows that can have the consistency of watery slurry. For *Turitea* this is of particular concern as a number of the streams within the wind farm site are deemed to be ecologically sensitive, particularly in their headwaters. Heavy rainfall could also trigger sedimentation discharges into the PNCC water supply reservoirs located within the Turitea Reserve. The environmental consequences of these types of disturbances if not properly managed and controlled could range from minimal to severe.

Issues

- [3] Turning to specifics, the key issues surrounding rainfall will include:
- the probability of certain magnitude rainfall events occurring and their durations, particularly with respect to the actual construction timeframe when bare earth is exposed to easy entrainment;
 - the engineering characteristics of the built structures such as road embankments, road runoff channels and culverts, stockpile construction and management, and sediment retention structures;
 - the sensitivity of the receiving environments and the measures adopted to avoid or mitigate ecological damage in these environments;
 - the risk of slope failures, either of constructed slopes or of existing slopes in the unmodified environment.

Experts

[4] Experts who gave evidence on rainfall and its effects were Mr Levy, Mr William Shaw (principal ecologist and a director of Wildlands Consultants for MRP), Dr Salinger and Mr Mark-Brown (introduced in earlier chapters of this report), and Ms Isobel Gabites, (also introduced earlier).

Evidence and Discussion

[5] The wind farm proposal will see vegetation cleared for the construction of platforms for the turbine sites, the substations and work areas; vegetation clearances, reshaping and realignment of the main water catchment access road; and new roads for access to the turbine platforms. Outside of the water catchment, it is proposed that excess soil from construction activities will be stockpiled and reshaped in managed spoil disposal areas each with a stormwater retention pond of sufficient size to accommodate moderately large rainfall events.

[6] We address the first of these effects in this chapter of our report with the balance being covered in separate chapters.

Rainfall Events

[7] It is Mr Levy's view that with *Turitea* being such a large construction site, construction managers will need to be kept progressively informed of predicted rainfall and its aerial distribution. The importance of this is such that MRP has agreed to have a weather station set up on the site for the duration of the construction period. This is to be commended.

[8] Construction activities will be impacted both by the volume of rain, which falls over extended periods of time, when the ground can become saturated and by short-term intense rainfall events. The first of these is measured by *annual* rainfall and its *seasonal* variations, and the second by what is known as the 'average recurrence interval (ARI)' daily intensity.

[9] Starting with *annual and seasonal* rainfall, Mr Shaw gave evidence that he believes the annual rainfall at *Turitea* is between 1,400mm to 4,000mm evenly spread over the year.¹ MRP's AEE describes the rainfall as around 2,000mm a year on the ridge crests but in lower parts of the reserve as being around 1,400mm. A Department of Scientific and Industrial Research Soils Report (1996) quoted by Mr Levy has figures of 950mm at Palmerston North rising progressively with altitude and moving south and east to 2,540mm at the highest point.² Dr Salinger's estimate ranges from 1,300mm in the north, to just over 1,800mm in the south, with the level of summer rainfall being about 75% to 85% of the winter rainfall.³

[10] In his evidence, Dr Salinger described two methods which he had used to calculate the two-year and 10-year ARI daily intensities. Using the National Institute of Water and Atmospheric (NIWA) Research High Intensity Rainfall Design System (HIRDS) method, he calculated the two-year ARI daily intensity as being in the range from 62mm at the north of the site to 100mm at the south, with the equivalent 10-year range being from 85mm to 137mm. Under the second method, based on extrapolating rainfall records from *Turitea*, he calculated the two-year ARI daily intensity as being between 71mm and 81mm from the north of

¹ Shaw, William NOE 340.

² NOE 340.

³ Salinger, EIC para 9.

the site to the south of the site, with a 10-year ARI daily intensity of 103mm at both locations. In approximate terms, the 10-year ARI daily intensity can be seen to be about 40% more than the two-year ARI daily intensity.⁴

Restrictions on Construction Timing

[11] In an email to Ms Gabites who was concerned about high rainfall events during the months of October and December, Mr Levy says:

Winter works relate not just to rainfall, but also (in fact more so) to ground conditions. October is into a period where there is increased evapo-transpiration relative to winter, and hence the ground dries out and earthworks are again practicable. This is even more the case in December. The sediment control works will be designed for the larger rainfall events, which can occur at any time of the year. Therefore high rainfalls in October and December are not a reason for including them in the winter works category.⁵

[12] Mr Mark-Brown recommended that consideration be given to imposing specific controls on construction activities over the winter period when there are heavier rainfalls. Mr Levy, on behalf of MRP, identifies that, although the draft Construction and Environmental Management Plan (CEMP) states that 'weather permitting, works will continue through the winter period', MRP's proposed approach is to:

- (a) minimise winter working in areas that drain to those water bodies most susceptible to sediment effects, ie, the lower Turitea reservoir; high-value streams; and the upper Turitea reservoir (although works in the south-eastern ridge, where there are shallow soils, should be acceptable);
- (b) minimise winter working in the higher risk soil types – the finer deeper soils;
- (c) work with deeper cuts in weathered rock which is relatively low risk and therefore suitable for winter work.

[13] In Mr Levy's opinion, such an approach leads to the following working principles, which he considers were best addressed by appropriate conditions in the resource consent:

- (a) for those areas such as South Range Road that have low potential effects and have low risk soil types (e.g. shallow topsoil over weathered rock), construction should be permitted all year round because the materials involved would generally be suitable.
- (b) for those areas that have either higher potential effects, or have a higher risk soil type, regional council approval would be required on a month by month basis for undertaking work

⁴ Salinger, EIC para 12.

⁵ Exhibit 15. Minutes of Meeting: *Design Optimisation Minutes Final*.

through the winter season. The regional council could consider antecedent conditions (soil moisture and rainfall), long term weather predictions, and any issues specific to the relevant receiving environments at that time.

- (c) for those areas that have both higher potential effects and higher risk soil types, a prohibition on winter earthworks is probably appropriate.

[14] Mr Levy also advised that rainfall events with an ARI in the range of two to 10 years generate the majority of sediment from an earthworks site. He explained that less severe events, while more frequent, lack the intensity to mobilise and transport sediment whereas more severe events have the potential to generate larger volumes of sediment at lower probabilities of occurrence when the earthworks site is open. He has chosen to adopt the two-year ARI daily intensity for calculating the effects of a worst-case landslide event and, in doing so, to link this with the implementation of a hierarchy of environmental management plans.

Board Consideration of Comments on Draft Report

[15] Following a review of the comments received on the Draft Report, the Board has concluded that no modifications or clarifications are required to its Draft Report findings on *Turitea*'s rainfall.

Findings

[16] There did not appear to be any real disagreement over the rainfall estimates presented to us in the evidence of a number of experts except that Mr Levy under cross-examination by Mr Reardon discounted Mr Shaw's upper annual estimate of 4,000mm as being excessive by a factor of about two. Based on the estimates from the sources other than Mr Shaw, we would tend to agree.

[17] We also note from Chapter 3 of our report Dr Salinger's conclusion that the rainfall estimates for *Turitea* would be little influenced by variations in the natural weather cycles (such as ENSO and IPO) or by the influence of climate change.

[18] We were left in some doubt as to which rainfall estimates had been adopted by the engineers in their assessment of particular effects. For example, when questioned by the Board, Dr Salinger advised us that he had spoken to Mr Levy but did not confirm whether Mr Levy had in fact used his or some other estimates when calculating the effects of the worst-case landslide scenario. We provide further comment on the use (or otherwise) of Dr Salinger's weather-related inputs in the discussion section of Chapter 3 of our report.

[19] We were also unsure as to whether the worst-case landslide scenario should have been based on a two-year ARI daily intensity event (as adopted by Mr Levy) or the more severe (around 40% by Dr Salinger's assessment) 10-year event, although for practical purposes the outcome may be little different. We discuss this in more detail in Chapter 7 of our report.

[20] We note from Mr Chris James' evidence that, based on a two-stage 40-month development programme for the wind farm, a total time of about 26 months had been allowed for the construction of the civil earthworks, roading and turbine foundation components. In doing so we acknowledge that this was for the turbine layout as originally proposed by MRP and that a lesser period would inevitably be required for a smaller number of turbines.

[21] In any case, it would seem to us that earthworks might well extend over two winters when the rainfall would be at its worst. To take account of this, restrictions have been imposed on winter construction in the nominated areas of the wind farm as set out in Schedule 2 of the Resource Consent Conditions.

Chapter 7: Palmerston North City Water Supply

Introduction

[1] The Turitea Reserve is a highly sensitive site not only because of its ecological importance but also because it is the catchment which provides much of the water for Palmerston North City with its population of around 68,000. For these reasons the proposal included detailed evidence from a range of experts on the potential effects of the wind farm on water quality and the mitigation of these effects. It also attracted particular attention from PNCC's legal advisers whose lengthy cross-examination focused on MRP's planned protections of both the reserve and the water supply. The general public has been prevented from entering the Turitea Reserve for a very long time in order to preserve the water quality of the water catchment.

Submitters

[2] Many submissions and evidence queried the sense of allowing major earthworks in the catchment involving around 100-odd construction workers over a three-year period. It is clear there is widespread public concern for the ongoing protection of the water supply in a sensitive environment, both during construction and during the life of the wind farm (which could be up to 35 years if we are to approve the consent term requested in MRP's consent application).¹

Issues

[3] The key issues surrounding the protection of the Turitea water catchment and its water supply reservoirs include:

- lessons learnt from the failure of a sediment control device during the construction of *Project West Wind* at Makara;
- the importance of the catchment as the primary source of Palmerston North's water supply;
- submitter concerns on the potential contamination of the reservoirs from sediment runoff; oil and fuel leakages from construction machinery, the wind turbines and the substations; nutrients from disturbed vegetation; wash down water from concrete batching plants; debris runoff following a fire; and the disposal of construction and operator toilet effluent;
- the potential for increased water treatment costs at the PNCC water treatment plant;
- the effects of a worst-case landslide scenario on the reservoirs and the water treatment plant;

¹ See Chapter 1.

- the emergency response plan for the continued operation of the water treatment plant during construction of the wind farm;
- water quality monitoring before, during and after construction.

Experts

[4] Experts who gave evidence on the potential effects of the construction of the wind farm on PNCC's water supply system were Mr James and Mr Levy (introduced in earlier chapters of this report); Mr Arthur Male, a hydrologist and Mr Chris Taylor, a water resources engineer, both from GHD Limited and both specialist advisers to PNCC; and for MRP, Mr Andrew Watson, technical director Water Supply from Beca Consultants and Dr Brian Coffey, an aquatic ecologist who has been involved for some time in advising PNCC on the sampling and monitoring of the aquatic environment at *Turitea*.

Evidence and Discussion

Project West Wind Makara Experience

[5] It is fair to say too that the issue was highlighted throughout the hearing because of rainfall events during construction of Meridian's Makara *Project West Wind* farm on a coastal site near Wellington. These events caused major sediment runoff from the site with sediment flows down streams and open terrain into the Makara estuary and Cook Strait. Experts variously described what happened at Makara as:

- the result of the use of 'inadequate' Greater Wellington Regional Council (GWRC) Sediment Guidelines (now under revision)² and/or lack of modification of the guidelines and need for them to be better tailor-made to account for local conditions;
- the use of 'best management practice' which tends to be reactionary to what happens, rather than utilising the 'precautionary approach' which is central to adaptive management techniques and adaptation to localised conditions and risk assessment generally.³

[6] In discussing what he described as a 'catastrophic release of sediment' at Makara, Dr Coffey outlined adaptive management techniques to avoid a similar event at the *Turitea* project namely through:

- keeping to a minimum the amount of ground to be developed at any one time (applying the principle of having the smallest exposure of earthworks);
- for areas prone to slumping, locating spoil disposal areas in the least sensitive catchment(s);

² Blaschke, EIC para 6.6.

³ Ibid, para 6.3.

- stringent monitoring of the engineering works in case the sedimentation ponds and management strategies might need to be changed, to prevent what occurred at Makara.⁴

[7] These techniques will apply to construction work both within the Turitea water catchment (as covered in this chapter of our report) as well as in surrounding catchments within the area of the wind farm development (as covered in a separate chapter).

Iterative Design

[8] The experts advising PNCC stated that, at the time they prepared their evidence, it had been difficult to provide accurate information in response to various issues they had identified around construction, spoil sites, sediment runoff and water quality as there was only limited design information from MRP. This resulted in the need for further evidence and caucusing throughout the hearing in an iterative design process.⁵ The engineering s42A report commissioned by the Board on MRP's construction works in the Turitea catchment also became an important source for checks and balances on some issues.⁶ The further result of this overall process was that many issues raised at the outset by both submitters and expert witnesses became agreed and finally resolved during the course of the hearing, with many of the agreements reached to be incorporated in the conditions to the consents sought.

Catchment Overview

[9] The following is an overview of the Turitea catchment taken from the evidence of Mr Male:⁷

The Turitea catchment is some 2,400 hectares in area. Storage is approximately 1,680 megalitres in the upper reservoir and 280 megalitres in the lower reservoir (1 megalitre is the equivalent of 1 million litres).

Two main streams feed the upper reservoir. The one from the south covers approximately half the total catchment area. The other drains from the northeast and covers approximately a quarter of the total catchment area. Numerous small tributaries drain the rest of the upper reservoir catchment area.

The lower reservoir is fed from the upper reservoir and a stream from an additional catchment area that has a confluence just downstream of the upper reservoir dam.

⁴ Coffey, NOE 499.

⁵ One such example being Minutes of Meeting: *Design Optimisation Minutes Final*. Beca, 7 August 2009, p7.

⁶ Mark-Brown, s42A Report.

⁷ Male, EIC paras 14–20.

The range of elevation in the catchment is slightly more than 500 metres from the water treatment plant intake to the highest point in the catchment.

The catchment slopes are undulating to steep, with some 200 hectares of relatively flat land known as Browns Flat located in the south west of the catchment.

Vegetation is dominantly native bush and scrub cover. Some areas of exotic forestry exist and along parts of the western side of the catchment, grassland supporting farming activities dominates.

[10] The water supply catchment was originally developed in the early twentieth century, with the lower dam being constructed in 1928 and the upper dam in 1957. Both capture and store raw (untreated) water.

[11] The catchment provides in the order of 30 megalitres per day to Palmerston North City and several other smaller surrounding communities. This is approximately 60% of the water supplied, the balance being made of up groundwater bores which, after treatment, directly feed into the reticulation network.

Existing Water Quality

[12] Mr Taylor described the raw (untreated) water quality in the Turitea reservoirs as being typically very good, reflective of the protected nature of the catchment and activities within the catchment, although with the quality likely to deteriorate during and following rain events.⁸ He advised that the Turitea water treatment plant treats the water to meet the Drinking Water Standards of New Zealand (DWSNZ 2005). The plant is well operated and maintained by PNCC staff being graded A by the Ministry of Health, the second highest grading which equates to 'Completely satisfactory, extremely low level of risk'. He advised that PNCC has recently drafted a Public Health Risk Management Plan (PHRMP) for the water supply in accordance with DWSNZ 2005, which at the time of the hearing was in the process of approval. This documents how PNCC will manage risks in the collection, treatment and distribution of drinking water to minimise any adverse effects to the public.

Effects on Water Quality from Wind Farm

[13] In relation to potential effects on water quality in the PNCC reservoirs from wind farm construction activities, Mr Male's criticisms for PNCC of MRP's initial plans for the Turitea catchment in the AEE included a number of issues which we identify here:

- the risk of soil disposal sites contaminating the water supply (although we note that during the course of the hearing, MRP

⁸ Taylor, EIC paras 23–27.

advised that it had decided to move all disposal sites outside of the Turitea water catchment);

- with most of the earthworks and runoff control devices being proposed on or along ridgelines, the control of the release of stormwater from these areas will need very careful management;
- the event with the greatest consequence would be a failure of a runoff or sediment control device resulting in sediment and vegetation being deposited in one or both of the reservoirs.

[14] In addition, other concerns raised by submitters included:

- the potential for sediment-laden water to increase PNCC water treatment costs and reduce water storage capacity over time ‘while sediment particles may bind with contaminants such as nutrients, metals, organic compounds etc’;⁹
- toilet facilities if not provided at the turbine sites during the construction phase could result in the contamination of the surrounding areas;¹⁰
- the potential for oil and lubricants from turbines, as well as fire debris (ash) and fire-fighting chemicals entering waterways.¹¹

[15] To these we add our own list of components of the wind farm where there may be potential adverse effects arising from surface-water disturbances during construction, including:

- the platforms and foundations for the turbines and wind monitoring masts;
- for the redesigned wind farm, around 28 kilometres of new roads and 24 kilometres of upgraded roads;
- excavation for underground power reticulation in these access roads;
- the substations at Browns Flat and the pine plantation;
- the two concrete batching plants;
- the foundations for the 220kV internal transmission line;
- the removal of extensive tracts of exotic and native vegetation.

[16] Most of these issues and concerns relate to the potential effects on water quality from rainfall generated sedimentation runoff which we will return to later.

[17] In addressing the other issues and concerns listed, we draw substantially on the evidence-in-chief of Mr James and also on a Memorandum of Counsel for MRP which we refer to below.

⁹ #48 Fuller, NOE 2536.

¹⁰ #577 McKay, NOE 2373.

¹¹ #700 Tippet, NOE 2009; #636 Harker, NOE 2851.

[18] Mr James advised that the concrete batching plants, to be located at the plantation substation and the Browns Flat substation respectively, will be well away from the water storage dams. Each will utilise a sealed storage and transfer system for cement to minimise the risk of contamination. They will also be bunded to capture runoff.

[19] Mr James also advised that during construction, all domestic waste water will be collected in porta-loos with holding tanks and then taken off-site for disposal.¹²

[20] Fire debris (ash) would obviously result from a fire. The management of fire risk is not, strictly speaking, a water-related issue and it could be argued that it does not fit neatly within this section of our report. We have included it here for completeness so that it does not get overlooked.

[21] During the hearing, as a result of concerns raised by a submitter, we requested MRP to respond on the risks of fire and also on contaminated spills.

[22] In response, a Memorandum of Counsel dated 14 October 2010 drew attention to Mr Levy's rebuttal evidence which specifically addresses fire issues. This outlines MRP's proposed fire risk preventative measures which include the control of access to the site, the carrying of water fire extinguishers in all contractor vehicles at all times (with no foam or powder extinguishers to be used), details of the inspections to be undertaken both at the completion of each working day and after any construction blasting is undertaken, and the prohibition of any fires on the site. These measures also include the identification of potential fire risks which might arise from electrical sources such as transmission lines and substations and the details of the proposed design and layout methods to be applied for mitigating the risk of fires from these electrical sources.

[23] The memorandum also notes that PNCC has the primary role for managing fire risks within the Turitea catchment as it is the rural fire authority, landowner and manager of the Reserve. In addition, DOC is the rural fire authority for the neighbouring lands. Both have fire management plans for the areas under their control.¹³

[24] Mr Levy notes that MRP's planning for the project will involve the preparation and implementation of environmental emergency response procedures as well as a project emergency plan, both requirements under MRP's health and safety policy. In particular, MRP will ensure that these emergency response plans are integrated with the PNCC and DOC fire management plans and submitted to the authorities for approval.

[25] Turning to the potential of an oil spill leading to contamination of the water supply, the MRP memorandum notes that any leakage of lubricating oil or hydraulic fluid from a wind turbine would be fully contained and drained into an internal sump for collection and disposal. The adoption of industry best practice will also involve the use of bunds and oil catch tanks to prevent leakage of oil

¹² James, EIC paras 11.1–11.27.

¹³ Memorandum of Counsel MRP, 14 October 2010, para 6.

from the substations with any rainwater collected being discharged outside of the Turitea catchment.

[26] MRP's proposals for managing fire risks and oil contamination demonstrate a responsible approach in the planning, project design and construction management of the wind farm project based on the adoption of industry best practice. All of the proposed measures will be incorporated in the proposed conditions of consent.

[27] Whilst also acknowledging the measures proposed to control the *release* of contaminants at their source, Mr Taylor nevertheless considers it appropriate to assess the effects on water quality if contaminants should in fact escape into the reservoirs. So do we.

[28] The contaminants considered by Mr Taylor in his assessment include sediment, as measured by suspended solids or turbidity colour (although Mr Taylor notes coloured water events are not uncommon in New Zealand and are generally not a significant health risk), organics, pollution as measured by faecal coliforms and Biochemical Oxygen Demand (BOD), nutrients such as nitrogen and phosphorous, hydrocarbons and algae.¹⁴

[29] Mr Male also identified these factors as being important for their potential to change the dynamics of the reservoirs. It is his view that, while they are individual issues to a certain extent, some of them need to be considered in combination with others. As an example, in 2006/07 there had been an incidence of adverse ecological response (algal bloom) in the reservoir and Mr Male considers any increase in nutrient runoff would increase this risk. Further nutrients may be stored in sediments within the reservoir and released if the reservoir is stratified¹⁵ and the layers turn. This can lead to a 'burst' effect in releasing the nutrients stored. So it is not only what runs off but there is a time factor as well, because nutrients can accumulate over time in the stratified layers and sediments in the reservoirs. Further, if there is a failure of sediment and runoff control measures there could be a pulse or wave of water and/or sediment moving through the catchment. Mr Male had observed this response in other small catchments where these were cleaned down to bedrock by water and sediment over-run.

[30] Mr Taylor acknowledges that residual hydrocarbons from accidental oil or diesel spill are likely to be mitigated due to the level of dilution in the reservoirs.

[31] On the other hand, if increased sediment is generated as a result of the project, impacts on the water treatment plant could include:

- heightened sludge volumes as a result of increased turbidity/suspended solids;

¹⁴ Taylor, EIC paras 28–37.

¹⁵ Male, EIC para 25. There is no clear evidence that temperature stratification exists but some profiling indicates it occurs in the upper reservoir.

- an increase in chemical composition in view of the changed water character which may require adjustment of operational practices during times of increased sediment (solids) loading;
- an increase in filter solids loading as a result of increased solids ‘carryover’ from the preceding clarifier units that may necessitate more frequent washing and, in turn, create additional wastewater than would otherwise have been the case.

Sediment Runoff

[32] In Mr Levy’s opinion, any slips will most likely be localised in newly cut batters during and soon after construction when the sediment control works are still in place. The principal deposition areas from these localised slips will be on the roads or turbine platforms where the soil can be removed to the soil disposal areas. Apart from the generally shallow topsoil layers, any slips will comprise broken weathered rock. Mr Levy does acknowledge that, even with the sediment control works, some sediment will inevitably be discharged into the reservoirs.

[33] Messrs Levy and Male had independently assessed the increase in the existing sediment runoff which would result from *general earthworks construction* activity in the catchment. Whilst there were significant differences between their two assessments, under cross-examination, both agreed that, even with Mr Male’s upper estimate, because of the large relative differences between this estimate and the volume of water in the reservoirs, the sediment load risks were manageable and the concentrations reaching the water treatment plant would be low.

[34] Mr Watson in his evidence affirms Mr Levy’s prediction that sediment could increase by about 2.5% as a result of the construction activities, and that in the long term the sediment loading change will be insignificant when compared with the existing situation. Mr Watson’s opinion is that an increase in sediment loading of this order during the construction period would have a minimal impact on the coagulant dose required for water treatment and, in fact, is likely to be barely measureable. He expects that sludge production from the treatment plant could increase by around 1% to 1.5%, which should not pose any issues for the plant.¹⁶

Landslip Worst Case

[35] Mr Levy identifies, however, that a worst-case scenario could be from a slip in the Waters’ property. This is the farmland at the north-western corner of the wind farm site which discharges directly to the lower reservoir. In his view, such a slip would only occur after an extended period of severe weather, worse than a two-year ARI¹⁷ daily intensity storm, and with a lower probability of occurrence since it would probably not occur in every such storm. In the event that such a slip did occur, it could release up to 130 tonnes of sediment. This

¹⁶ Watson, RE para 3.2.

¹⁷ Levy, RE para 6.11.

material could be expected to comprise up to 40% clay and 20% silt or around 78 tonnes of the total 130 tonnes. (He did note that through most of the rest of the site, the silt/clay fraction is estimated to be less than 15%.)

[36] Of the 78 tonnes of clay/silt, Mr Levy had estimated that about 47 tonnes could reach the reservoir within the storm period. Most of the remaining 31 tonnes of material would settle out in the reservoir, with much of the finer clay would remain in suspension for an extended period of time. Mr Levy estimated, assuming full mixing, that, for the lower reservoir, this could result in concentrations in the order of 160 grams per cubic metre (g/m^3) persisting for some days, but gradually reducing to background concentrations over about two weeks.¹⁸

[37] Mr Levy identifies, however, that a more realistic failure might be a small slip with a lower clay content and a lower proportion of the mass reaching the reservoir. This would lead to a peak sediment concentration of less than 80g/m^3 in the lower reservoir and lower than this in the upper reservoir.

[38] Under another potential scenario, Mr Levy goes on to say that a 100m^3 slip fully deposited in the lower reservoir would reduce the reservoir depth by less than 5mm and less than 0.05% of its storage capacity. For the upper reservoir, a slip would have much less effect and in both cases the risk to reservoir capacity would be less than minor.

[39] Mr Watson has independently assessed Mr Levy's scenario of a hypothetical slip of 100m^3 occurring after an extended period of severe weather on a part of the Waters' property. In this event, Mr Watson estimates that coagulant dose rates at the treatment plant would need to increase significantly (perhaps double), but with appropriate controls as are required for events that currently occur, the treatment process is capable of maintaining compliance with New Zealand Drinking Water Standards.

[40] Mr Watson advised us that the water treatment plant is equipped with four horizontal flow clarifiers and eight dual media filters which are designed for high solids loadings, and are capable of handling high suspended solids loads in excess of the maximum of 160g/m^3 estimated by Mr Levy under the worst-case scenario landslide.

Contingency Plans

[41] Mr Watson outlined the PNCC contingency plans for the existing sludge handling system at the water treatment plant.¹⁹ We do not need to repeat these here except to state that it is his opinion that these plans are very robust and will ensure the continued operation of the water treatment plant should there be a worst-case scenario landslide during or after the construction of the wind farm.

¹⁸ Levy, RE para 6.12.

¹⁹ Watson, RE para 3.4.

Other Potential Contaminants

[42] Turning to contaminants other than sediment and their potential effects on water quality in the reservoirs, Mr Levy assumes that some cleared vegetation may be used as mulch on batters. On the one hand this may lead to a reduction in turbidity (and apparently 'colour' in the water supply reservoir) due to reduced sediment load. However, Mr Levy points out:

The natural decomposition of biological matter contributes to the organic content and 'true colour'. Dissolved organic acids like tannins and lignins give water a brown/yellowish tea-like colour. Therefore, the use of mulch in the catchment may increase the 'true' colour of the water body. However, the quantity of vegetation cleared and retained as mulch relative to the size of the catchment and the current land (forest) would have little effect on the colour of water in the reservoir.

[43] Any discharge of nutrients from the project (eg, nitrogen in its various forms, and phosphorus) could increase the risk of algal blooms in the reservoirs. Mr Levy estimated that in the operation phase the increase in loadings would be in the order of 4.2% for nitrogen, and 1.9% for phosphorus with Mr Male's equivalent estimates being 3.5% and 6.4% respectively. During the construction phase, Mr Levy estimates increased loadings of a lesser order from the general earthworks, but notes that there would be a significant nutrient pulse loading in the reservoir in the event of a slip in the earthworks.²⁰

[44] Mr Watson identifies that, historically, the raw water data for *Turitea* shows that the existence of nitrate, nitrite and ammonia have not been an issue. But even if these parameters were to increase significantly, there would be no cause for concern.

[45] He points out that the factors that led to the 2006 algal bloom event are reported by GHD to have been related to low rainfall in the catchment, unusual environmental conditions (these are not described) and unusual management of the supply. Following the incident, PNCC elected to not address the risk of blooms with source or catchment measures as these were considered to provide little security. Instead, the council adopted treatment as the preferred solution and installed a powdered activated-carbon dosing system.

[46] Mr Watson goes on to observe that reservoirs that stratify (layer) are vulnerable to algal blooms.²¹ Although an earlier GHD report makes reference to reservoir water quality modelling being undertaken by PNCC,²² there are no other references in the more recent material from GHD about such a measure. Without one, he notes that it would be difficult to predict the impact of increasing nutrients on the incidence of blooms. Usually, a reservoir with nutrient concentrations of the order that are already present in the upper dam would face a small increase in the risk of blooms occurring with a small increase in the nutrients that are predicted to result from the development. The witness also notes that reservoir

²⁰ Levy, RE para 4.22.

²¹ Watson, RE para 3.8.

²² Male, EIC para 6(g).

destratification has proven successful in a number of water supply reservoirs for reducing the risks of algal blooms occurring, and that this could be considered by PNCC for Turitea as a risk mitigation measure if this was shown to be necessary.

[47] Messrs Male and Taylor also raised concerns about the effects of iron and manganese on the water treatment plant. In response, Mr Watson acknowledged that both of these were recognised as problem contaminants during the upgrading of the water treatment plant in the late 1990s. As a result, specific provision was made to elevate the pH of the raw water with soda ash and for dosing with potassium permanganate. Mr Watson notes that no increase in iron or manganese is expected from the construction activities and he disagrees with Mr Taylor that the treatment plant manganese reduction capacity is limited.²³

PNCC Responsibility for Water Quality

[48] Mr Watson outlined for us his understanding of PNCC's responsibility for the maintenance of the water quality in the Turitea reservoirs. In relation to the protection of sources of drinking water required under the Health (Drinking Water) Amendment Act 2007 (s69U), Mr Watson considers that PNCC could risk non-compliance with this provision by allowing wind turbines to be located within its water reserve.

[49] He also refers to the evidence of the Mayor, Mr Naylor, that MRP would be liable for any changes in catchment status or water quality and that this appears to absolve PNCC of any responsibility if it does not comply.

[50] But Mr Watson also drew our attention to s69U of the Health (Drinking Water) Amendment Act 2007, which says under the heading:

69U. Duty to take reasonable steps to contribute to protection of source of drinking water

- (1) Every drinking-water supplier must take reasonable steps to –
 - (a) contribute to the protection from contamination of each source of raw water from which that drinking-water supplier takes raw water;
 - (b) protect from contamination all raw water used by that drinking-water supplier.

[51] The word 'contamination' is defined as:

The introduction of a substance or organism into that water making it impalatable or unsuitable for human consumption without further drinking water treatment.

[52] There is also a general duty on the PNCC to protect from pollution all aspects of the drinking water supplied (s69U(2)).²⁴

²³ Watson, RE para 3.10.

²⁴ Ibid, para 5.2.

Caucusing Agreement

[53] The 9 July 2009 report of the second caucusing session among Messrs Male, Taylor, Levy and Watson sets out points of agreement and disagreement on water quality issues affecting the water supply. Of all those effects discussed in this chapter of our report²⁵ there was consensus among the experts during this caucusing session that all are seen to be ‘less than minor’ or ‘minor’, and that the management and control measures proposed are ‘adequate’ or ‘unlikely to be a major problem’. Conversely, the caucusing report indicated somewhat diverse opinions among the experts over the extent and timing of a water quality monitoring programme.

Water Quality Monitoring

[54] Mr Taylor considered that there was only limited data on raw water quality against which to measure the impact of construction activities on water quality within the Turitea catchment. To start with, he sought a minimum five-year Baseline Water Quality Monitoring Programme (BWQMP) and recommended that MRP fund this programme. He recommended too that PNCC and HRC inspect and review the resulting data over this five-year period.²⁶

[55] Mr Watson in his rebuttal evidence advised that he had been the project manager and design leader on a major upgrade of the water treatment plant undertaken in the late 1990s. He disagreed with Mr Taylor that there was only limited data available on raw water quality. Instead he pointed out that the historical raw water data collected for the design of the treatment plant upgrade provided a sound preliminary baseline. He said:

I obviously cannot recall the values of the historic raw water turbidity data available at the time of the design of the upgrade, but think it would have showed that the water was typically of good quality, say 5 to 10 NTU (Nephelometric Turbidity Units). However, during rainfall events and dam overtopping events it could get very elevated perhaps as high as 50 to 100 NTU. Raw water data for the last 5 years provided by PNCC as part of my May 2009 request shows results that range between 0.6 and 16 NTU. Although this is a reasonably extensive data set of over 100 samples, this does not match my memory of the historic data.²⁷

[56] In the caucusing report, Messrs Male, Taylor, Levy and Watson agreed that, subject to locating the historical data discussed by Mr Watson, one full range of seasons *could* be adequate for a BWQMP. Messrs Male and Taylor, however, preferred that this monitoring extend over two autumn and two spring

²⁵ Turitea water quality – Caucusing Agreement, 9 July 2009. Such issues being ‘detergent to water’, ‘hydrocarbons to water’, ‘sanitary waste water disposal’, ‘debris and rubbish’, ‘dust in private water supplies’, ‘channel runoff length’, ‘monitoring’, ‘duration – baseline and post-construction’. These listed are much the same for the whole catchment.

²⁶ Taylor, SE para 63.

²⁷ Watson, RE para 2.3.

periods, which by our reckoning would require an elapsed time of 18 months rather than a year.

[57] What was confusing to the Board is that this caucusing agreement also included a qualification that:

In the event that robust statistical monitoring is required, more than 1 year would normally be needed. However, the context of agreements between MRP and PNCC appears to provide for mitigation measures to be put in place, and because there is no need to apportion responsibility for effects, the focus of data collection should be towards supporting the development of management strategies.

[58] What would be covered by a monitoring programme has also been left somewhat vague. The 12 June 2009 caucusing report records under *Points of Agreement* the need for quantitative measurements to establish a full understanding of the reservoir dynamics. Conversely under *Points of Disagreement*, Beca (on behalf of MRP) states that such an assessment was not needed for project effects. The report also records under *Comments* that while PNCC has established continuous flow monitoring of the two water catchment tributaries, this should be extended to include water quality sampling of the tributaries, the inflow above the lower reservoir, and the surface and at depth in both reservoirs. As well, bathymetric surveys should also be undertaken of both reservoirs.

[59] Dr Coffey supports the need for bathymetric surveys as it his view that the actual rate of sedimentation may well be higher than may have been predicted. In addition, he recommends that the *trophic* status of the reservoirs should be established as there is currently a ‘spring flush’ of periphyton in the lower Turitea Stream suggesting that relatively high nutrient levels are released from the reservoirs during late winter/early spring. He also recommends a monitoring programme for the other streams in the surrounding water catchments which we address in Chapter 9 of this report.²⁸

[60] Turning to water quality monitoring within the Turitea catchment, at the time we prepared our Draft Report, we were left somewhat confused by the conflicting information in the expert caucusing records as to what the water quality monitoring programme should be. There was also no information which we could find as to the water quality measures that, if exceeded, might trigger the need for the adaptive management by MRP of the processes being used for the construction and/or operation of the wind farm. We were not assisted in clarifying any of this by the absence of any details on the proposed water quality monitoring programme in the 28 March 2010 Resource Consent Conditions.

[61] We therefore requested MRP to include with its comments on the Draft Report, responses on these matters which would need to be developed and agreed in consultation with PNCC and HRC (see paras 66–67 below).

²⁸ Coffey, EIC paras 8.1–8.14.

Aquatic Ecology within Turitea Water Catchment

[62] In Section 3.14 of his evidence-in-chief, Dr Coffey records that the Upper Turitea Stream within the Turitea water catchment supports a very high quality aquatic habitat that is very sensitive to reduced water quality/elevated suspended solids. He goes on to say at 4.14 that the Palmerston North City water supply reservoirs should be considered significant habitats of indigenous fauna in accordance with s6(c) RMA.

[63] In Section 7 Dr Coffey describes measures to avoid remedy or mitigate potential adverse ecological effects on the streams and reservoirs from construction activity (as well as for the streams which drain from the soil disposal areas outside of the Turitea catchment). In Section 7.3, with respect to the Turitea catchment, he concludes that:

Provided best industry practices are adopted and implemented, and given the location of the wind turbines and the majority of the access ways are on ridgelines and spurs that are separated from perennial reaches of surface receiving waters, the effects of constructing the proposed wind farm on aquatic ecology are expected to be less than minor.

[64] At Section 8.1, Dr Coffey proposes specific water quality monitoring programmes for both the Turitea catchment and for the streams in the surrounding catchments. He concludes at Section 9 of his evidence-in-chief that MRP's proposed consent conditions provide a suitable basis to proceed in relation to the effects on aquatic ecology.

[65] In Chapter 9 of our Draft Report we requested that MRP respond on some aspects of the aquatic ecology monitoring proposed by Dr Michael Joy, freshwater ecologist for TAG and FOTR, for the streams outside of the Turitea catchment. We note that this Draft Report request needed to be extended to include the Upper Turitea Stream and the water reservoirs.

Board's Comments on MRP's Response to Draft Report Monitoring Requests

[66] In its comments on the Draft Report, MRP drew the Board's attention to the linked provisions for the water quality monitoring contained in the conditions of consent, the water quality monitoring programme and the construction environmental management plan. MRP also proposed a number of amendments to the draft conditions of consent for the overall aquatic ecology monitoring to take account of Dr Joy's concerns.

[67] These responses by MRP have satisfactorily addressed the concerns raised by the Board on the water quality and aquatic ecology monitoring issues.

Findings

[68] In the light of the original caveats around the successful construction and operation of the wind farm espoused by Messrs Male and Taylor, we acknowledge that the agreements reached during the expert caucusing were a considerable achievement.

[69] Mr Levy acknowledges that the construction of the wind farm within the Turitea water supply catchment will result in an increased risk of contamination of the water in the reservoirs. But the risks are very low, well understood and the proposed environmental management techniques and plans²⁹ aligned to standard industry practice are robust.

[70] As we have noted in Chapter 6 of our report, we were uncertain as to which ARI daily intensity estimate had been used by Mr Levy in calculating the worst-case landslip scenario. We were also uncertain as to whether this should be for a two-year event, as adopted by Mr Levy, or for the 40% (approximate) more severe 10-year event. In doing so, we acknowledge that the choice of event is related to the probability of its occurrence when there are significant earthworks in progress during the construction of the wind farm.

[71] Given these uncertainties, we have considered the evidence of Messrs Levy and Watson on the effects of the two-year event 100m³ landslip on the reservoirs and the water treatment plant as well as the contingency measures which are in place for responding to high sediment loading on the plant.³⁰ Having done so, it is our view that these contingency measures, in conjunction with the proposed monitoring plan (which we discuss below), should provide adequate safeguards for the operation of the overall reservoir/water treatment plant system in the event that there is a larger landslip, triggered by up to a 10-year rainfall event.

[72] In his evidence-in-chief, Mr Levy also gave a detailed breakdown of how MRP intended to treat the risk of the contaminants he had listed. He concludes by stating that the systems proposed by MRP will achieve an acceptable level of protection to the water supply catchment so that the water supply to the PNCC is not adversely affected.

[73] Overall, we have concluded that when the extra detail provided by Mr Watson was added to this conclusion, together with the positive acknowledgements made by Messrs Taylor and Male (albeit with caveats), we could accept the case made by MRP as to how it was going to protect the water quality of Palmerston North's water supply, this being a major issue in this inquiry.

²⁹ Levy, RE para 2.4.

³⁰ Ibid, EIC para 92.

[74] It is also Mr Watson's opinion, which we share, that:

- PNCC, as drinking water supplier, has certain duties in relation to taking reasonable steps to contribute to the protection of raw water sources from contamination;
- the wind farm development changes the risk profile and that new profile needs to be (carefully) managed although it does not alter the level of treatment already being provided;
- management of the risk should be captured in the draft PHRMP (a June 2008 draft was attached to Mr Taylor's evidence) and measures to treat these risks documented such as Mr Watson notes.³¹

[75] The responses to the Draft Report provided by MRP have satisfactorily addressed the concerns raised by the Board on water quality and aquatic ecology monitoring issues.

³¹ Watson, RE, para 4.

Chapter 8: Terrestrial Ecology of the Reserve

Introduction

[1] In this chapter we examine the terrestrial ecology of the Turitea Reserve and the issues that arose from the extensive analysis by MRP of the potential impacts of the wind farm on terrestrial ecology together with the responses of other experts and individuals.

[2] Dr Heffernan for MRP identified that in the much-contested tender process the company went through with PNCC in 2005, its environmental reputation was a pre-condition to qualifying for the last round of that process. It was not until MRP won the tender that it made the commitment to wind development that it did. A key factor for PNCC's selection of MRP was around MRP's capability to deliver an environmentally sound outcome for the wind farm proposed to be constructed in a reserve. A further element was around commercial aspects of the project and in particular how the company structured an arrangement which incorporated the eco-park objectives of the council at the time.¹ An environmentally sound outcome for the terrestrial ecology of the reserve and issues around the eco-park are what we address in this chapter.

Submitters

[3] Many submitters were opposed in the first instance to the wind farm being in the Turitea Reserve. Despite the purpose of the reserve being altered to include the public benefit of renewable energy, members of the FOTR and TAG and many other individual submitters remained unconvinced that the inclusion of what in effect is a large industrial facility within the reserve's boundaries would enable it to be sustainably managed so that its emerging ecological strength and value to the area would be maintained.

[4] Several submitters were concerned that native vegetation would be destroyed by the construction of the wind farm while the intrinsic values of the area would be changed forever. They were concerned that the ecology of the reserve would be altered to such a degree that it could not be repaired.² Another submitter was concerned that the impact of construction and longer term maintenance requirements will detrimentally affect the ecology of Turitea Reserve and the heritage of the area.³ Professor John Flenley was concerned about the erosion risk in the terrain as a result of vegetation removal. Several submitters were very concerned about the prospects for the proposed remediation or rehabilitation of vegetative clearances that may arise from the project because of

¹ Heffernan, NOE 47.

² #314 Allan, NOE 2315: #583 Levin, NOE 2367.

³ #512 Buwalda, NOE 2214.

the very difficult climate conditions that exist on the site.⁴ Other submitters again raised the sufficiency of MRP's proposed mitigation package.

Issues

[5] The key issues surrounding the terrestrial ecology of the reserve have been addressed under a number of key headings as follows:

- the existing ecological values of the reserve;
- the revised design criteria for the wind farm;
- the nature of the engineering and construction work;
- the ecological impact of the clearances required;
- MRP's proposed mitigation measures;
- the results of the expert caucusing;
- the proposed ecological restoration works within the reserve;
- the critical areas for vegetation clearance – Game Ridge, the southern boundary with Hardings Park and the Tararua Forest, and the water catchment access road;
- the pine forest as a biodiversity offset;
- Browns Flat as a biodiversity offset;
- the eco-park proposal.

Experts

[6] The experts who gave evidence on the terrestrial ecology of the reserve were Mr William Shaw, principal ecologist and a director of Wildlands Consultants for MRP; Dr Paul Blaschke, an ecologist and environmental management adviser for PNCC; and Ms Gabites, landscape ecology consultant for TAG and FOTR. We also heard from Dr Gillian Rapson, a plant ecologist at the Institute of Natural Resources, Massey University, a submitter who provided a written and visual presentation.

Evidence and Discussion

The Existing Ecological Values of the Reserve

[7] Mr Shaw undertook an extensive survey of the Turitea Reserve, and describes its vegetation character as follows:

Tawa-dominant forest with emergent rimu is confined to the northern part of Turitea Reserve and covers an area of c.600 hectare. Secondary broadleaved forest, which includes patches of tawa-dominant forest,

⁴ #186 Cheyne, NOE 2652; # 672 Kelliher, NOE 2603.

adjoins the rimu/tawa forest and also occurs on the western side of the main ridge below c.400 metre. Mixed broadleaved forest with sparsely scattered remnant emergent podocarps is present in the main valley south of the water supply dams, and extends up to the main ridge in places, covering an area of c.400 hectare. Horopito forest and scrub is the predominant vegetation type, covering c.1,100 hectare throughout the Reserve, including most of the main ridge. Secondary broadleaved forest is also scattered throughout the Reserve, as are small areas of toetoe (*Cortaderia fulvida*), tussockland and exotic grassland.⁵

[8] Dr Blaschke identifies that the Turitea Reserve represents 90% of the identified ecological areas in Palmerston North City. He considers the reserve forms the major biodiversity reservoir for Palmerston North from which linkages and corridors can be created onto neighbouring land and into the urbanised parts of the city. He points out this significance was recognised both in the Turitea Reserve Management Plan (TRMP) and in PNCC's deliberations on the 2006 alteration of purpose for the reserve (PNCC 2006(b)).⁶

[9] While the purpose of the reserve was changed to allow the consideration of electricity generation projects in the reserve – a caveat was added in the form of a policy to the TRMP, which directs that projects will only be considered where they do not compromise the objectives of the plan (which have been little altered). But those objectives now too include one other – which requires ecological values to be mitigated appropriately if adverse effects arise.⁷ In Dr Blaschke's opinion, PNCC's progress to date in implementing the TRMP policies and objectives, such as its efforts to regenerate the indigenous vegetation of the reserve through animal pest control, have resulted in 'demonstrable improvements into the ecological conditions' with Relative Trap Catch rates of opossums now regularly below 5% – a threshold control level below which extensive forest damage is unlikely.⁸ In its proposal, MRP proposes to upscale the predator control mechanisms further to mitigate the adverse effects of its proposed vegetation clearances.

[10] Mr Shaw considers that areas of the reserve have been vastly modified by introduced animals, fires and plantation forests, with Browns Flat grazed from 1900–2000. As a result, he concludes ecological values across the reserve vary dramatically. Most of the vegetation clearance MRP proposes, which is described in the AEE as predominantly 'horopito forest and scrub', will be confined to the ridge tops which will be the most affected areas and not considered a threatened habitat. In Mr Shaw's Attachment WBS6 nevertheless, the horopito-dominant vegetation is portrayed as reasonably diverse in species composition and structure (including occasional emergent podocarp miro trees).⁹ Dr Blaschke considers from his point of view that the horopito-dominant vegetation contributes significantly to the biodiversity values and natural character of the reserve. Mr Shaw, however, remains of the opinion that, whilst the horopito-dominant

⁵ Shaw, EIC para 27, p13.

⁶ Blaschke, EIC para 3.11, citing Boffa Miskell (2002).

⁷ PNCC (Document 12) Document Bundle Volume 2, TRMP, para 3.

⁸ Blaschke, EIC para 3.10, citing P. Handford, pers. com., 30 April 2009.

⁹ Shaw, EIC Attachment WBS6.

vegetation has ecological values, it is of lesser significance measured against the tracts of ecologically significant vegetation elsewhere. Dr Blaschke was, however, quite clear that both the tawa-dominant forest and horopito-dominant forest are both of s6(c) RMA significance in the reserve notwithstanding the lack of protective classification in the POP.¹⁰

[11] Ms Gabites considers that the native vegetation within the proposal area, representing a range of successional and regeneration phases on old organic soils, has high ecological significance and wildlife habitat value. Scarce and threatened species of flora and fauna are present.¹¹ This conclusion is based on:

. . .the range, the diversity of micro habitats, the degree of vigour in the seral stages we are seeing, in the extent of it, in the way that it represents an increasingly healthy vegetative environment, which relates to a sequence of altitude range, and appears to have high aquatic values, [and] has apparently a wide range of invertebrate and bird populations which reflect both old and complex food chains and ecosystems.¹²

[12] Ms Gabites in her evidence-in-chief Figure 6 provided two Google Earth aerials at the same scale of the *Te Apiti* wind farm during construction with the *Turitea* landscape as a reference. She comments that, while some of the roading clearances at *Te Apiti* are in the process of being revegetated down from 10 metres to 6 metres, the hard-stand areas of the turbines and access roading are seen as intrusions in the rural land. But she notes that the designs of the roads and turbine zones and the general grand rural landscape in which the turbines are located have helped to diminish the impact of the wind farm in that setting.¹³ Conversely, Ms Gabites considers that it is not hard to see that the ridged and heavily vegetated landscape of *Turitea* is going to be heavily impacted upon by the roading and turbine and crane platforms of the proposed wind farm.

[13] Mr Shaw, while critical of some aspects of Ms Gabites' analysis, recognises the validity of the concepts listed by her (connectivity, vigour, diversity, resilience) but considers she nevertheless fails to recognise the importance of relative scarcity which appears to be the only feature missing.¹⁴

[14] Dr Rapson identifies that the *Turitea* Reserve and the horopito vegetation type is undergoing slow regeneration since the fires at the end of the nineteenth century, release of deer at the start of the twentieth century, and the 1936 gale which damaged much of the remaining native vegetation around the Manawatu, together with another bad gale in 1952. She identifies that this sequence of events (together with browsing animals) caused the collapse of the reserve vegetation (1955), so in her opinion the current regeneration rates of the relevant species assessed may now be around 60-years old. She says:

¹⁰ See Chapter 18 (Planning Instruments) below.

¹¹ Gabites, EIC para 131.

¹² Ibid, NOE 645.

¹³ After the hearing we had a site visit to *Te Apiti* to chiefly assess how roading was managed because of its potential impact at *Turitea*.

¹⁴ Shaw, RE para 198.

Interestingly at least 45% of the species known to be present in the reserve are found within about 20 metre of the ridgeline. This is a very **high floristic diversity** in an area which can be roughly estimated at 48 hectare (12km of road x 20m either side of ridgeline), ie **4.3%** of the 1100 hectare estimated in the AEE to comprise “horopito forest and scrub”, or **0.14%** of the area of the whole reserve. A strong case can be made for the ridgelines being the area of the reserve most meritorious of protection [our emphasis].¹⁵

[15] Some of the horopito trees Dr Rapson identified on her site visits appear to be 3.6 metre tall so she assesses it is possible that this particular vegetation is 110 years old. She is strongly supportive of the need to protect the horopito-dominant vegetation on the ridgeline (which will be most affected by the clearances for the wind farm) because of the range of species it contains. While MRP’s AEE makes no attempt to give the age of the trees, making it harder to assess the impact of the clearances of this native vegetation, Dr Rapson considers such clearances will inevitably delay plant community development (called ‘succession’) by 60 to 100 years and probably longer. Mr Shaw, when questioned by the representative for TAG and FOTR as to how long it would take for the vegetation destroyed by the wind farm to regrow to its present form, estimated 70 to 80 years, so the guesstimates of these two experts for substantial regrowth of this native vegetation are 30 years apart which is a generational difference.¹⁶

[16] In Mr Shaw’s opinion the highest value ecological sites in the Turitea Reserve are the tawa-dominant forest, the aquatic habitats (based on the evidence of Dr Coffey) and the wetlands of Browns Flat (degraded). He notes that these sites are recognised and accorded a degree of protection in the HRC POP. He identifies the reserve as having a very high quality tawa-dominant forest in the lower catchment. This is because the species is shade tolerant and will regenerate under a thick canopy but is incredibly slow in doing so. In his opinion the project is not going to affect the tawa-dominant forest in the lower catchment or the wetlands at Browns Flat. Potential turbine sites in the tawa forest, and those adjacent to the wetlands, were removed on Mr Shaw’s advice, and the transmission facilities have been realigned to avoid the tawa forest also.

[17] Dr Blaschke identifies the tawa forest as a broadleaf–podocarp forest occurring within the reserve and notes too that it is identified as a threatened habitat within the POP but accepts it will not be affected by the proposal with one proviso – around Game Ridge – an area which we address further below.¹⁷

[18] Meanwhile, the middle part of the Turitea Reserve is described by Mr Shaw as ‘horopito dominant’ with heavily shaded understoreys.¹⁸ Because the site is a very windy environment it also has a predominance of species, particularly the horopito, which is very wind firm. This results in a very thick canopy which is well able to handle some degree of wind exposure. This area is

¹⁵ #334 Rapson, Submission, p4.

¹⁶ Cookson, NOE 1926.

¹⁷ Blaschke, EIC para 4.14.

¹⁸ Shaw, NOE 580.

also described as a mixed secondary forest with sparse remnant and emergent podocarps scattered through it with tawa remnants and regenerating tawa in places.¹⁹ Mr Shaw is also critical of Dr Rapson's opinion of the reserve. He notes horopito-dominant vegetation has developed as a result of severe degradation of the rata-kamahī forest by possums and other introduced animals and will require intensive pest management to restore it. In any event it does not have a 'scarcity value' in his opinion because it extends 20 kilometres along the Tararua Range citing Dr C Bycroft, Wildlands Consultants Ltd (pers. comm.).²⁰ Mr Shaw, however, appears to contradict himself because he acknowledges that the horopito-dominant vegetation is significant in terms of s6(c) RMA, although he emphasises (to achieve this status) this area needs to be seen as part of a much larger tract of indigenous vegetation extending many kilometres south of the reserve which accounts for its significance.²¹ We return to the importance of his statement when we consider Part 2 RMA in Chapter 19.

The Nature of the Work

Water Catchment Road

[19] We note under Rule 9.6.1(e) *Permitted Activities* of the PNCC District Plan that 'Roads' in the Rural Zone, which includes *Turitea* are a permitted activity provided they comply with specified Performance Conditions, although there is no definition of 'Road' in the Plan.

[20] Section R17.6.1 of the Plan sets out the Rules for Permitted Activities, with Appendix 17C, Objective 1:

To ensure that notable trees, other vegetation, areas of significant vegetation and habitats of significant indigenous [sic] fauna within the City are appropriately protected.

[21] Following Objective 1, Policy 1.2 is:

To protect scheduled notable trees, areas of significant indigenous and other vegetation.

[22] And Policy 1.3:

To avoid remedy or mitigate the effects of activities or development which could diminish or destroy the cultural, historical, botanical or visual amenity value associated with the scheduled trees, or areas of significant indigenous and other vegetation.

¹⁹ Shaw, NOE 582.

²⁰ Ibid, RE paras 9–10.

²¹ Ibid, NOE 584–585. See also Lucas, EIC under Chapter 12.

[23] We have therefore concluded that any vegetation clearance required for the widening of the water catchment road must comply with these policy provisions to:

... avoid, remedy or mitigate the effects of activities or development.

[24] From our site visit, we developed the impression that, while the existing carriageway of the water catchment road is about 5 metres wide, the road corridor is around 10 metres wide over much of its length meaning that the 'indigenous' vegetation clearances for the widening may be a lot less than first thought. There are, however, two sections of this road to be realigned to bypass narrow winding sections of the existing road and these will require substantial clearances. We return later to discuss these two sections.

Turbine Access Roads

[25] With the redesign, the layout of the roading network to the turbine zones was essentially unchanged from MRP's original design other than being some 5 kilometres shorter overall. For sites in indigenous vegetation, the roading network decreased by about 608 metres with a related decreased requirement for vegetation clearance of about 0.6 hectares. We comment later in this chapter on the changes to these parameters following the Board's decision to delete further turbines.

Turbine Platforms

[26] At the outset, we define our understanding of the terminology used to describe a turbine zone, a turbine platform and a turbine:

A turbine zone is a defined surface area at a proposed turbine site within which the turbine will be located following detailed investigations and design.

A turbine platform is the area within the turbine zone from which vegetation will be cleared and a level metalled base constructed to accommodate the onsite storage of turbine components and the pad for the erection crane.

Part of the platform site will be excavated to accommodate the turbine foundations.

The turbine is the steel tower together with the nacelle, generator, gearbox and rotating blades, with the tower being supported on a reinforced concrete foundation pad buried in the ground beneath the tower.

[27] Mr James had this to say (paraphrased):

The size of the platform is primarily driven by the access requirements of the crane and the temporary storage of turbine components prior to

erection. The crane pads will need to be approximately 33 metres by 20 metres wide (depending on final turbine selection). In addition to the prepared crane pad, an area of approximately 17 metres by 30 metres is required for the turbine foundations. Wherever possible the crane pads will be adjacent to and parallel with the access roads. This will allow onsite storage of turbine components such as towers, nacelles, hubs and blades. Where it is not possible to position the crane pad clear of the roads, due to restricted sites or excessive earthworks, it may be necessary to utilise the road as part of the crane pad. This would require “just in time” delivery of turbine components. All crane pads will be positioned and excavated to a level such that all foundations will be in cut. This methodology is preferred as it provides the most suitable foundation conditions for the turbines.

[28] Mr James states that at the end of the wind farm’s life in 35 years’ time, when the resource consent expires, all above-ground structures will be removed, and the various turbine platforms backfilled, topsoiled, regrassed or vegetated as necessary.²²

[29] The Board recognises however that, one day, consent may be sought to extend the life of the wind farm beyond 35 years and that the concrete which goes in to the turbine platforms will remain forever in the ground.

Ecological Impact of Clearances

[30] This is what Mr Shaw had to say under his Appendix WBS7 in terms of the criteria he applied in the evaluation of the ecology of the various turbine zones and their access roads:

- **Representativeness:** the extent to which an area is characteristic or representative of natural ecological diversity, including the range of vegetation, habitats and species.

Representativeness is the primary criterion, based on a comparison of present vegetation cover versus past extent, diversity and pattern, naturalness and size.

High Best, relatively large, good-quality example; only example of type which was formerly more extensive.

- **Naturalness:** the degree of modification as compared with likely original unmodified character. The degree to which the vegetation and habitats reflect likely natural character. Most mainland ecosystems are modified but the degree of naturalness is an important consideration.

High Low-level or nil human disturbance (includes secondary vegetation established following natural disturbance).

²² James, NOE 158.

- **Rarity and special features:** the presence of any rare community types, species, or other rare features. The relative rarity of vegetation, habitats and species within an ecological region or district or on a national basis.

High Nationally threatened species present.

[31] Based on evaluations using the above ecological criteria, ecological values were then ranked as ‘Exceptional’, ‘Very High’, ‘High’, ‘Moderate’ or ‘Low’. Brief descriptions of the first three of these values are provided below.

- **Exceptional:** example of a highly representative vegetation or habitat type that displays all of the components of natural composition. The community is considerably reduced in extent or rare in the ecological district or region. Threatened species may be present.
- **Very High:** example of a representative habitat type that displays nearly all of the components of the original composition. Threatened species may be present.
- **High:** example of a representative habitat type that has most of the components of its natural composition, although these may have been affected by fire, selective logging, or severe animal browse. The community is not particularly common (sic) in the ecological district or region, threatened or at-risk species may be present.²³

[32] Mr Shaw considers that the primary ecological impact of the construction and operation of the wind farm will be the clearance of indigenous vegetation dominated by horopito forest (*Pseudowintera colorata*) and other secondary vegetation within the Turitea Reserve. He says this:

The wind farm infrastructure ... can be established at a large proportion of the sites proposed with minor or relatively minor ecological effects. However, there are some sites where, due to terrain or the need to establish wind farm infrastructure – particularly new access roads in otherwise intact indigenous vegetation – the resultant ecological effects are not minor and a significant level of mitigation is proposed by Mighty River Power to mitigate those effects.²⁴

[33] As well as vegetation clearances, other potential adverse effects from construction include ‘edge effects’ and ‘fragmentation’. Mr Shaw records that edge effects can result from the clearance and opening up of forested margins, allowing wind and light to penetrate further into the forest interior, resulting in changes to light regimes (with resultant changes to various plant species that have different light requirements), moisture (open margins allow greater wind penetration, and more drying of forest understoreys), and overall changes in forest understorey microclimate. He identifies that these changes can promote the invasion of exotic weeds into forest margins, as well as other changes. Physical

²³ Shaw, EIC WBS 7, pp97–99.

²⁴ Ibid., para 15. See also Gabites, EIC paras 37–45 on the significance of the vegetation; she identifies HRC classifies the reserve as of ‘High Conservation Value’.

alteration of forest margins can also promote considerable wind damage along margins that would otherwise be wind-firm and stable (although this is very unlikely to occur with horopito-dominant vegetation).²⁵

[34] Mr Shaw also identified encroachment into forest patches and cutting of roads through forest patches as having the effect of breaking remnants into fragments in terms of ecological processes. The distance of these effects can extend up to 80 metres, subject to topography, vegetation structure and wind environment. His assessment of potential damage from the proposal is, however, that edge effects with the proposed turbine layout will be very much at the lower end of the scale because of the wind-shorn low stature of the existing vegetation; the vegetation on the ridges having developed in a high-wind environment; and the turbine sites and roads being located on ridge crests with the topography (and existing vegetation) sloping (often very steeply) away from these features. He considers that new access roads in indigenous vegetation (excluding the flatter sections of the water catchment access road) could extend over a distance of about 9 kilometres. In a worst-case scenario, possible edge effects could extend to up to 10 metres on each side of these new roads, although a more likely scenario is that these would be limited to about 5 metres.²⁶

[35] Finally, Mr Shaw identified potential operational effects of the proposal as the possible need to reopen construction platforms or to widen roads for turbine maintenance and the need for maintenance of vegetation height to maintain wind flows and clearance/trimming associated with electricity lines.²⁷

Mitigation

[36] There are several types of mitigation proposed by MRP:

- initial revegetation of the areas to be cleared during construction to include browntop grassing by hydro-seeding to minimise any effects from placement of the roads and turbine sites in the reserve;
- secondary planting of indigenous woody species and large herbs once the initial vegetation cover of these identified areas has taken place, with care to plant these species only in sheltered micro-sites due to the severe wind conditions on the site;
- direct transfer of existing and underlying vegetation to another suitable recipient site;²⁸
- nursery-raised plants of the ‘early successional’ species are to be established by being planted into the rehabilitation soils at the same time as broadcasting seed or soon after;
- extensive weed control;
- extensive predator control;

²⁵ Shaw, EIC WBS 7, para 71.

²⁶ Ibid, paras 73–74.

²⁷ Ibid, para 78.

²⁸ See also # 334 Rapson, Submission.

- for MRP's original wind farm layout, indigenous revegetation of 75 hectares of the pine forest is also planned through a combination of indigenous planting (10 hectares) and managed natural regeneration (65 hectares).

[37] We return later to discuss the proposed revegetation.

[38] Mr Shaw considered the area to be cleared (after the redesign, 27 hectares) would ostensibly be available for rehabilitation/revegetation once the turbines and other wind farm infrastructure were in place. Further, following completion of construction, he considers it is feasible to rehabilitate much of the originally proposed 10-metre road width, the base of the turbines and the turbine crane platforms, although due to the windy nature of the site he notes this rehabilitation will be slow. It is his view that rehabilitation of the road margins could be carried out using methods designed to protect vegetation margins, by using a combination of direct plant transfer (which he considers will provide very rapid edge closure) and contouring of soil substrate to produce low bunds that protect new edges from sediment and stormwater runoff and also lift wind flows²⁹ to avoid wind-associated loss of vegetative cover.³⁰ The bunds, as well as the cuts, will be revegetated using various combinations of hydro-seeding and planting.

The Results of Expert Caucusing

Caucusing (1)

[39] At a caucusing meeting on 12 June 2009, before the Board began sitting, the following matters relating to terrestrial ecological matters were agreed and noted in the Caucusing Agreement (Mr Shaw, Dr Blaschke and Ms Gabites):

- the use of locally sourced indigenous species was agreed for hydro-seeding but while Mr Shaw and Dr Blaschke support the use of browntop to achieve rapid cover, Ms Gabites did not agree with this course of action on the basis it would introduce new exotics into sites that are covered with indigenous vegetation (para 4);³¹
- that to achieve successful indigenous vegetation it is necessary to control all introduced browsing animals in the reserve, including deer (para 5);
- that the remaining pines be felled to waste to minimise soil disturbance and provide cover for the future establishment of indigenous species (Ms Gabites did not agree to this) (para 6);
- that a detailed rehabilitation and revegetation plan as well as a weed hygiene plan, should be provided as a condition of consent (details given in paras 12,14);

²⁹ Shaw, EIC para 75.

³⁰ TAG and FOTR, Submissions, Section E.

³¹ *Statement of Agreement Reached in Caucusing* by William Shaw, Paul Blaschke, Isobel Gabites and John Craig, 19 June 2009.

- that there would be merit in more frequent and intensive monthly weed monitoring during the first 3 years of the project, including inspections for weeds (para 15);
- that the entire area of bare soil surface needs to be rehabilitated promptly except for roads and working areas required to be kept open on an ongoing basis; revegetation should take place at the base of the turbines where possible (para 16).

[40] The agreement also considers various aspects of the eco-park proposal (paras 7, 9). We note, however, that there was little agreement at this stage on which areas qualified as mitigation for the potential adverse effects from the wind farm.³²

Caucusing (2)

[41] At further expert caucusing on 12 March 2010 among Mr Shaw, Dr Blaschke and Ms Gabites, a number of issues that had been in contention among the experts appear to have been largely resolved except for the following:

- eco-sourcing: Ms Gabites and Dr Blaschke consider that any eco-sourcing should be from LENZ level 4 environments and that plants be sourced from similar altitude while Mr Shaw considered that there was an appropriate condition of consent namely ‘or from the wider Manawatu Group South Ecological District or from similar altitudes in equivalent LENZ level 2 based on the review of the LENZ level 2 and level 4 maps’.
- use of browntop: Ms Gabites continued to be opposed to the introduction of large amounts of browntop through the site but agreed in principle with the need for a condition to limit the number of exotic species deliberately introduced.

[42] We note that all agreements from both caucusing sessions by the experts were reflected in the draft conditions filed by MRP on 28 March 2010 with the exception that altitude eco-sourcing is to take place with Mr Shaw’s opinion prevailing. Question marks remained, however, about what should happen to the plantation forest. In that respect we note included in the MRP 28 March 2010 Resource Consent Conditions, that draft condition 34 detailed the rehabilitation/revegetation plan state as follows:

Rehabilitation/Revegetation Plan

34. The Consent Holder shall engage a suitably qualified and experienced ecologist to prepare a Rehabilitation/Revegetation Plan for the site *to achieve the revegetation of at least 75 hectares of existing and former pine plantation* within the area shown in Appendix (3) to this Schedule (final area to be determined in consultation with Palmerston North City Council (as landowner)), ‘*or another area of equitable size*’, and turbine platforms, where possible (approximately 8 hectare). This revegetation shall use a combination of indigenous planting and management of natural revegetation

³² *Statement of Agreement Reached in Caucusing* by William Shaw, Paul Blaschke, Isobel Gabites and John Craig, 19 June 2009.

(specifically the control of wildling conifers and other invasive weeds)
[our emphasis].

[43] The inclusion of the words ‘or another area of equitable size’ as an alternative to revegetation of the plantation forest as a biodiversity offset for Browns Flat is discussed in detail later in this chapter.

Matters Arising From Caucusing

[44] Dr Rapson, who did not participate in the caucusing, did not want MRP’s development in the reserve at any cost, but even then much of what she had to say was helpful. Ms Gabites was unhappy with various aspects of the proposal but appears to be prepared to accommodate it in her caucusing, as long as a number of her concerns around Game Ridge and other issues such as the plantation forest were identified and accounted for. Dr Blaschke did not dispute turbines in the reserve as long as water quality could be maintained in the reservoirs, the turbines on Game Ridge were removed and the ephemeral streams outside the catchment were protected. Also, Mr Shaw considered that the aspects of rehabilitation and restoration which MRP put forward in mitigation for the adverse effects of the clearances of native vegetation for turbine and crane platform locations together with roading were sufficient to meet purposes of the RMA. Thus three of the expert terrestrial ecologists gave their approval to much of MRP’s proposal (subject to what we conclude below).

Ecological Restoration Works

[45] Dr Rapson depicted in her presentation to the inquiry the steps she envisaged in the restoration of the site:

- Restoration is re-planting of indigenous plant communities:
 - It gives a constructed or accelerated secondary succession.
 - It is a way of overcoming anthropic disturbance.
 - It can overcome dispersal and seedling establishment limitations.
- Successional processes should be used to accelerate restorations.
- Eventually species should (in theory) disperse naturally into the area:
 - Via wind into microsites where seedlings can survive.
 - Via birds which use new plantings as habitat or perches.
- But management will always be necessary because of:
 - Small size and huge boundary effect.
 - Vulnerability to stochastic events.
 - Mosaic vegetation patch effects.³³

³³ #334 Rapson, NOE 979.

[46] We consider MRP's schedule of ecological restoration works recognises most of the elements for restoration considered by Dr Rapson. Seed spreading, planting of pioneering (early successional) species, direct transfer and hydro-seeding, as well as containing soil surfaces to create bunds along road edges to prevent runoff and wind shear are all part of the initial process. Thus the first steps in the rehabilitation/restoration process, called 'Initial Revegetation' by Mr Shaw, seem an intensive operation, carefully thought out.

[47] Mr James for MRP considered toetoe and browntop (an exotic grass already common at the site) would be preferable to cover the road berms, the turbine platforms and crane bases – something supported by Mr Shaw and Dr Blaschke. Instead of browntop, Dr Rapson (and Ms Gabites) would prefer native seeds (Mr Shaw mentions native grasses such as bush rice grass, *Microlaena avenacea* and *Chionochloa conspicua* could be used), but Dr Rapson could not see any capacity in the ridgeline vegetation to collect the requisite quantities of seed of any species. She suspects as a result browntop is the inevitable species to use and hopefully it will be shaded out by establishing shrubland.³⁴

[48] We note the evidence that browntop is already well established along the entire length of the water catchment access road, where it forms a relatively open cover, inter-mixed with other species. The species can invade indigenous grasslands but is not an invader of woody systems, such as those present in *Turitea*. We therefore agree the use of browntop as suggested to establish, in this situation, a relatively benign grass cover to protect the soil and to enable future planting of indigenous species (which will require monitoring and maintenance to avoid losses to a range of threats, including suppression by other species). Dr Rapson sees it as a low fertility grass – it will take quite well in the short term and persist in the long term.³⁵

[49] As to eco-sourcing and the difficulties which apparently surround that process, we note Dr Rapson's concession in cross-examination that eco-sourcing in any quantity from the ridgeline, while desirable, would be nightmarish.³⁶ We accept the related provision made in MRP 28 March 2010 draft condition 34 as sufficiently precautionary in this case.

[50] While Ms Gabites considered toetoe too dense to facilitate the growth of other more important species, Mr Shaw was convinced that toetoe is part of the natural sequences at *Turitea* and will in time be replaced by woody species. As a natural coloniser of the reserve it is also very resilient. This information became important because with all the soil excavation and species replanting that will ensue, toetoe appears to be sufficiently dense and strong along road edges to accommodate being flattened intermittently by cranes going through the access roads over the 35 years. And if browntop, too, is as resilient as it appears to be it should also be able to sustain the activities of a working wind farm on most of the sites identified.

³⁴ #334 Rapson, 1016.

³⁵ Ibid, 1017.

³⁶ Ibid, 1002.

[51] Following on from this conclusion we consider that Mr James' suggestion to raise the height of the outer edges of the road berms at strategic locations to provide wind protection of existing sensitive vegetation should become part of the planting plan on the sides of the access roads.

[52] We also consider that the exacting weed monitoring and strict noxious animal controls that are proposed in the conditions of consent will allow the successions on other sites in the reserve, which have developed naturally (ie, without planting) even on the harshest sites, to continue.

[53] Mr Shaw agrees with Ms Gabites that natural regeneration can be a slow process especially on skeletal soils at higher altitudes (Professor Flenley gave evidence that the soils on the ridgeline are very thin – bedrock which he has measured himself is only 50 centimetres below the surface in many cases).³⁷ Mr Shaw observed, however, that new edges in horopito-dominant vegetation where wind monitoring masts were established are already undergoing natural regeneration and a thickening of cover along the recently formed edges (the Board saw an example of this at one monitoring mast). He states that new edges formed as part of the wind farm development are to be subject to landform and soil rehabilitation, soil containment and rapid treatment by planting or direct transfer (or various combinations of these techniques).

[54] Dr Rapson was very critical of the poor state of the nursery trials she had observed, and the Board similarly considered that many did not appear to be effective, although we did take into account some had been accidentally killed with spray. We consider, however, there is enough time for MRP to perfect direct transfer trials incorporating some of Dr Rapson's advice about such issues.

[55] Dr Blaschke assessed the vegetation clearance required for the transmission pylons as being minor, situated as they will be in small clearings with very low stature horopito-dominant vegetation.³⁸ Mr Shaw endorses that assessment pointing out that considerable effort has gone into placement of pylons to avoid adverse effects.³⁹ He gives the example that care has been taken in positioning the proposed transmission line so that it does not affect the tawa-dominant forest, while the low-impact route for the transmission line avoids all taller stature forest.⁴⁰

[56] Finally, as to weed invasion, the ecologists are all concerned that construction of the wind farm will escalate the invasion of weeds into the reserve. Dr Rapson specifically mentions the long grasses that have invaded the plots for the direct transfer trials – a fact we saw for ourselves on our site visit.⁴¹ But equally, Dr Rapson considers that by moving earth around by direct transfer it moves the seed bank, small organisms and small herbs and provides quite a lot of micro-site habitat for further regeneration. It is therefore essential (and pleasing to

³⁷ #515 Flenley, NOE 1791.

³⁸ Blaschke, EIC para 4.16.

³⁹ Shaw, RE para 39.

⁴⁰ Ibid, para 68.

⁴¹ #334 Rapson, NOE 988.

see) that MRP has included a mitigation package that includes a significant annual element of weed monitoring and control.⁴²

Critical Areas for Vegetation Clearance

[57] In Table 5 of his evidence-in-chief Mr Shaw identifies that, for MRP's redesign, in four areas containing 24 turbine zones there will be more than minor adverse ecological effects from the removal of indigenous vegetation requiring significant levels of mitigation.⁴³ These are:

- 10 turbine zones (WT57 to WT66) on Game Ridge which require new roads through secondary forest, scrub and shrubland, and localised areas of exotic grassland;
- 5 five turbine zones (WT39 to WT43) on Back Ridge (South) which each require new roads through horopito-dominant vegetation and through local areas of other secondary broadleaved forest and scrub;
- 6 turbine zones (WT28 to WT33) on a steep narrow section of 'the main ridge' adjoining the Tararua Forest Park and Hardings Park.
- 3 turbine zones (WT44, WT45 and WT46) at the southern end adjacent to Hardings Park which also require extended access roads through horopito-dominant vegetation and through local areas of other secondary broadleaved forest and scrub.

[58] To this we would add the substantial clearances required for two realigned sections of the water catchment access road in the vicinity of WT26 and WT33 and as a result of comments on the Draft Report clearances around WT15-WT20: see paras 104 of this Chapter.

[59] Mr Shaw also assessed that there will be 'minor adverse effects' for turbine zones WT34 to WT37 along the ridge adjacent to Hardings Park. But the information tables in Attachment WBS8 (as amended) of Mr Shaw's evidence-in-chief, and supported by Ms Gabites, summarise the information collected by his company Wildlands Consultants. Without exception, the ecological values and the degree of impact for each of those areas listed above have both been assessed by Mr Shaw as being 'high'. But Mr Shaw does not have misgivings about these impacts because of the balancing restoration and rehabilitation effects proposed by MRP elsewhere on the site.

[60] The adverse effects of the clearances required for the turbine platforms on Game Ridge (WT57–WT66), Back Ridge (South) (WT39–WT43) and adjacent to Hardings Park (WT44–WT46) would be significantly extended by the clearances required for the access roads to these turbines.

[61] The Beca drawings show indicative turbine platform areas of around 55 metres by 25 metres, or an area of about 1,400m². If the average width of the access roads is taken as 10 metres (noting that, with the need for cut and fill

⁴² Shaw EIC paras 130–131: see also MRP Draft Conditions (28 March 2010).

⁴³ Ibid, EIC paras 5,60, 62.

batters on this very hilly site, vegetation clearance could be required over a much greater width), the clearance required for each 100 metres of access road would be 1,000m². In approximate terms, each 140 metres of access road would require vegetation clearance equivalent to that of a turbine platform.⁴⁴

[62] Having briefly described these areas of particular concern, including the need for quite extensive access roads to many of the turbine zones, we now turn our attention to examining each of the areas in some detail.

Game Ridge

[63] In this section we consider the turbines proposed by MRP on Game Ridge numbered WT56 to WT66 but excluding WT56 which is located clear of the indigenous vegetation.

[64] Game Ridge is a steep ridge that drops away to the Turitea Stream. To access the turbine platforms, roads would need to be cut through the centre of the forest described as ‘a central part of the native vegetation of the reserve’.⁴⁵ We have assessed the total length of these access roads to be around 3.4 kilometres. Based on the 10-metre road width as originally proposed by MRP, the road clearance required would total around 34,000m² (3.4 hectares) compared with the area to be cleared for the 10 turbine platforms of around 13,750m² (1.4 hectares). It can be seen from this analysis that the area of road clearance required is about 2.4 times the area required for the 10 turbine platforms.

[65] In Appendix 2 of his evidence-in-chief, Mr Naylor, Mayor of Palmerston North City, refers to a copy of a report prepared for PNCC by Wildlife Consultants and, in particular, to a summary of *Vegetation Types of Turbine Zone and Access Road, Ecological Values, Degree of Ecological Impact, at Each Turbine Location and Associated Access Road in Turitea Reserve*. For the area known as Game Ridge, encompassing turbines at high altitude the vegetation in the turbine zones with no exceptions is described as of ‘high ecological value’ with the degree of impact assessed as ‘Very High’ to ‘High’ while the Ecological Evaluation of New Access Roads (with one exception) was considered ‘Very High’. The turbine zones are otherwise generally identified as having no notable features.

[66] Mr Shaw also identified that these turbine zones in his opinion ‘require a significant level of mitigation’.⁴⁶

[67] Dr Blaschke considers that the most significant adverse ecological effects overall would arise from these Game Ridge turbines. He states he cannot support any of this group of wind turbines on ecological grounds because they will involve the:

- (a) clearance of a significant area of native forest;

⁴⁴ Beca, Turitea Wind Farm Site Layout Drawings (update 18.12.10).

⁴⁵ Shaw, NOE 589.

⁴⁶ Ibid, EIC para 60. See Chapter 13 for an amendment to the phrase ‘more than minor’.

- (b) fragmentation of natural character; and
- (c) proximity of the clearance to steep slopes and waterways.⁴⁷

[68] Mr Shaw responded that the loss of the vegetation on Game Ridge was one of the reasons why MRP was suggesting substantial mitigation through revegetation of so many hectares of the reserve. He says:

I mean we haven't made any bones about the fact there were going to be some adverse effects and that has been quite a clear message I think that we've consistently run with for the project, including at the PNCC hearing on the reserve status where I said – gave pretty much the same message. There will be some adverse effects and that is exactly what we are talking about now, and that is the justification for substantial mitigation.⁴⁸

[69] The 'substantial mitigation' appears to us to largely consist of the rehabilitation or reversion of 75 hectares of plantation forest which we discuss in some detail later in this chapter.

[70] Mr Shaw states that while the turbines on Game Ridge are placed in horopito-dominant vegetation 'down that ridge there is a change with more diversity to be coming through the canopy'.⁴⁹ Going south of the tawa-dominated forest again, there is a mixed secondary forest with sparse tall tree remnants and emergent podocarps scattered throughout as well as horopito shrubs which can be seen on the lower slopes of Game Ridge.⁵⁰ And there are scattered tawa adjacent to WT66 and between WT65 and WT66.⁵¹ The presence of tawa is indicative of species from indigenous primary forest.⁵²

[71] In a letter to Mr Baker of PNCC dated 22 February 2010, Dr Blaschke indicated that he agreed with Mr Shaw's assessment of ecological effects for the redesign – namely that, overall, they had been mitigated because of the reduction in road length within the indigenous vegetation and the reduced requirement for vegetation clearance by about 0.6 hectares. But Dr Blaschke still concluded:

Finally, I note that the redesign does not make any significant changes in respect of the Game Ridge group of turbines. Therefore any position of opposition to turbines 57-66 on ecological grounds remains unchanged, for the reasons given in my earlier evidence.⁵³

[72] We focus on Game Ridge because Dr Blaschke identified this area as requiring the significant clearance of native forest, creating fragmentation of natural character in addition to its proximity to steep slopes close to the

⁴⁷ Blaschke, EIC para 5.3.

⁴⁸ Shaw, RE para 41.

⁴⁹ Ibid, NOE 582.

⁵⁰ Ibid, NOE 582.

⁵¹ Ibid.

⁵² Ibid, EIC, LWB37 *Descriptive of Vegetation Types*.

⁵³ Baker, SE, 22 February 2010. Appendix 3, Letter by Paul Blaschke, para 4.

waterways. We also focus on Game Ridge because Mr Shaw identified it as cutting through the central part of the native vegetation in the reserve and as part of an area of ecological significance stretching south down the ridgeline, which is a matter of national significance under s6(c) RMA.

Findings for Game Ridge (WT57–WT66)

[73] If the Turitea Reserve represents 90% of the ecological area of Palmerston North City, we have concluded, in the light of s6(c) RMA, that Game Ridge should be recognised and protected as containing ‘high’ ecological values.

[74] Ms Gabites identifies the threat that once a closed (thick) canopy, such as the horopito-dominant community on Game Ridge demonstrates, is weakened, then the climate plays a major role in its further demise.⁵⁴ We fail to see that a central part of the reserve, which is regenerating as mixed secondary forest with sparse tall remnants scattered throughout, should have its canopy weakened. Mr Shaw’s evidence disclosed there are scattered tawa in the canopy below and adjacent to turbines WT60, WT65 and WT66 which suggests the tawa-dominant community in the lower reserve is beginning to regenerate further up into the catchment. And he mentioned that the species mix there is slightly different to the horopito-dominant vegetation across the bulk of the reserve,⁵⁵ which also suggests it contains more diverse species in the horopito-dominant community.

[75] Secondly, in spite of the concession that Game Ridge is part of an area of ecological significance in terms of s6(c), Mr Shaw does not consider the range of species present as ranking of national significance, as the plant species (possibly falling within development areas associated with the wind farm), are not classified as threatened, except *Brachyglottis kirkii* (‘At Risk’), and from that species cuttings for replanting have already been taken. He considers the range of species present in the reserve is certainly ‘of local and possible regional significance’ as it ‘supports local and regionally threatened species (also some habitats, such as the tawa-dominant forest)’.

[76] There is some confusion here in Mr Shaw’s thinking. The legislation (namely s6(c) RMA) does not require areas of significant indigenous vegetation to be divided up into hierarchies of significance – local, regional or national – although their identification may occur district wide as in regions. ‘The matter of national importance’ is the ‘area of significant indigenous vegetation’ irrespective of whether it falls within the city of Palmerston North, the Manawatu District or the rohe of Rangitane. Once an area, as here, has been identified as containing significant indigenous vegetation then the fact of that identification triggers a need for recognition and protection as a matter of national importance – not of local or regional importance. How far that protection and recognition goes, however, is a matter of degree in any one case.

[77] What MRP’s turbine layout portrays is the break up and fragmentation of what its own expert witness identifies is an area of significant indigenous

⁵⁴ Gabites, NOE 1020.

⁵⁵ Shaw, NOE 591.

vegetation which the legislation requires to be recognised and provided for as a matter of national importance. The expansive scatter of very large turbines and their large and relatively shallow concrete bases throughout the Game Ridge area (the latter designed to remain forever in the landscape even if buried), with 10-metre wide roads (as originally proposed) to each turbine, discounts this significance, let alone fails to protect it. We consider Game Ridge forms a central place in the area of ‘significant indigenous vegetation’ (the whole being the total sum of parts such as the ridges in question).

[78] Finally, there is an issue about the range and depth of the concrete turbine foundations. We have already set out what Mr James said about these. Dr Rapson was asked what might be grown over such buried deep concrete slabs:

I do not think you could ever get anything other than small alpine “herby things” to grow on the top of a concrete pad. Even if you put a metre of soil on top of it, anything of any size would sooner or later get down to the concrete, lick it twice, realise it is full of lime and probably curl its toes up. It is very hard to do anything with a concrete pad in the long term. ... the truth is it is going to be concrete for the next 500 years so it is going to stay there unless it is taken off the site.⁵⁶

[79] What MRP plans for is that the concrete foundations of 10 large turbines will remain forever in part of a significant ecological area that is a matter of national importance. There being no indication they will ever be removed. The vegetation on those sites will not regenerate/rehabilitate as it is hoped the rehabilitation/restoration of the roading access ways will do. Of course, this will also apply to all of the turbine foundations in the wind farm.

[80] For all of these reasons we have concluded that the WT57–WT66 on Game Ridge should be declined.

Back Ridge (South)

[81] In this section we consider WT39–WT43 which are located at the end of individual access roads along spurs which run more or less south east from the water catchment access road along the back ridge. Ms Gabites and Dr Rapson gave their close attention to these turbines possibly because they were easy to access in the limited timeframes they had to assess the ecology.

[82] In the AEE for the redesign, Mr Shaw identified that turbine zones WT39, WT40, WT41 and WT43 are located in an area of indigenous vegetation where he has assessed the effects of clearance to be also ‘more than minor’.⁵⁷ Mr Shaw also noted that the access road lengths to each of these turbines have been reduced under the MRP redesign, although we note that these still total some 1.5 kilometres. The clearance required for these roads would still be around

⁵⁶ #334 Rapson, NOE 1020.

⁵⁷ Letter, Wildlands Consultants to Mark Henry, 28 January 2010, MRP Turitea Wind Farm *Assessment of Environmental Effects*, Turitea Wind Farm Redesign, February 2010.

15,000m² (1.5 hectares) compared with an area of 5,500m² (0.55 hectares) for the turbine platforms, a ratio of about 2.7:1.

[83] We note that Mr Shaw did not include turbine zone WT42 in this group and wonder whether this might have been because its access road is only 250 metres long compared with about 500 metres for the other four. Based on our assessment that 140 metres of access road requires the same area of vegetation clearance as for a turbine platform, the clearance area for the access road for WT42 would be around 1.8 times that of the turbine platform. We would therefore consider that WT42 should be included in the same category of clearance requirement as for WT39, WT40, WT41 and WT43.

[84] Ms Gabites considers the canopy along the ridgeline is closed.⁵⁸ She advised us that, on her site visits, she had the opportunity to investigate the designated access roads for turbines zones WT39 and WT40. She notes within just a few metres from the water catchment road, the species *Raukaua edgerleyi* (by the time she gave evidence it had been taken off the threatened species list) was plentiful and at both areas the canopy was 5 to 6 metres. She considers that if this is typical of the intrusions into the more sheltered eastern aspect sites, then the adverse effects of clearance will be significant. Ms Gabites also points out that other canopy species present, such as tawa and miro, are like raukaua – mid-to-late successional stage species. In her opinion to replace such losses through mitigation planting packages will take at least 30 to 40 years before closed broadleaf canopy conditions become suitable for their growth.

Finding for Back Ridge (South) (WT39–WT43)

[85] The clearances required to enable the construction of WT39–WT43 have been assessed by Mr Shaw to have ‘high’ ecological value and a ‘high’ degree of impact with effects that are ‘more than minor’. Extended individual roads are also required for access to each turbine. Irrespective of the reasons described in Chapter 12 of this report on the unacceptable effects that these same turbines would impose on the ridgeline of the Tararua Ranges, our decision on ecological grounds is that these turbines numbers WT39 to WT43 should be declined.

Hardings Park Ridge

[86] Here we consider the effects of the vegetation clearances required for MRP’s redesign for WT28 to WT37 and WT44 to WT46 at the southern end of the wind farm along the ridge between Hardings Park, the Tararua Forest Park and the Turitea Reserve, which for simplicity we will call Hardings Park Ridge.

[87] Starting with WT44, WT45 and WT46, under the redesign, each of these turbines would require an access road of between 150 metres to 250 metres in length to connect them to the water catchment road. The status of WT45 under the redesign was uncertain, with the Beca geospatial drawings showing it as an ‘Additional Track and Pad 2.3MW layout’. For the purposes of our evaluation of

⁵⁸ Gabites, EIC para 39.

the redesign layout we included it, although in the final analysis this was not determinative of the conclusion we reached. Applying an equivalent analysis to that used for Game Ridge and Back Ridge (South), for a total length of 600 metres of access roads to WT44, WT45 and WT46, the combined road clearance required for these turbines would be 0.6 hectares compared with the turbine platform clearance of 0.42 hectares. The ratio here of road to turbine platform clearance would be about 1.4:1 compared with 2.4:1 for the Game Ridge turbines and 2.7:1 for the Back Ridge (South) turbines.

[88] As we have already noted, six of the remaining turbine zones (WT28 to WT33) have been assessed by Mr Shaw as being located in vegetation with 'high' ecological value where clearance would have a 'high' degree of impact and where the effects would be 'more than minor'.

[89] This leaves four turbines (WT34–WT37) which have been assessed by Mr Shaw as having the same 'high' ecological value and 'high' degree of impact as the other turbines in this area but where he has assessed the effects as 'minor'. The reasons for the effects' distinction (from 'minor' to 'more than minor') between these four turbines and the balance of the turbines in the Hardings Park Ridge area are not evident from Mr Shaw's assessment. But as we set out below, this distinction has not been material in our finding for this area.

[90] We also need to consider the impact of the water catchment access road in this same area, which we now address.

Water Catchment Access Road

[91] At the southern end of the site in the vicinity of Hardings Park Ridge, in order to provide suitable geometrics for the transport of construction cranes and the very long turbine blades, it will be necessary to realign the water catchment road over a total length of about 600 metres on either side of WT33. As well as the 10-metre road width (as originally proposed), the Beca drawings indicate that additional width of an average of about 8 metres is required to accommodate cut and fill slopes on either side of this new carriageway. This length of new road would then require around 1.4 hectares of indigenous vegetation clearance, the same area as for the 10 turbine zones (excluding the access roads) on Game Ridge.

[92] It will also be necessary to realign a total of some 300 metres of the water catchment access road on either side of WT26 to bypass a narrow winding length of the existing road in this area. Based on the same parameters which we have applied to WT33, this length of new road would require around 0.7 hectares of indigenous vegetation clearance.

[93] There are also a number of other locations along this ridge where significant cuts and fills are required to accommodate the road widening. This road widening and the realignments will be essential if MRP is to have access for the construction of the turbines beyond Hardings Park Ridge.

Finding for Hardings Park Ridge (WT28–WT37, WT44–WT46)

[94] All of the Hardings Park Ridge turbines, including the access roads to WT44 to WT46 and the water catchment access road, are in an ecological continuum between Hardings Park, the Tararua Forest Park and the Turitea Reserve and considered of significance under s6(c) RMA to be protected. The ecological effects of the clearances required for their construction are very similar to those applying to Game Ridge.

[95] As for Game Ridge, if the Turitea Reserve represents 90% of the ecology of Palmerston North, in the light of s6(c) RMA, then Hardings Park Ridge should also be recognised and protected as containing ‘high’ ecological values.

[96] Again, as for Game Ridge, with reference to s6(c) RMA, once an area has been identified as containing significant indigenous vegetation then the fact of that identification triggers a need for recognition and protection as a matter of national importance. Two of MRP’s own witnesses, Mr Shaw and Dr Coffey, also consider that the continuum of the native vegetation tract from Game Ridge southward through to Hardings Park and the Tararua Forest Park would be a s6(c) issue.

[97] At the time we prepared our Draft Report, we were left in something of a quandary on consistency as to how we should respond to the indigenous vegetation clearances required for the turbines and the two realignments across Hardings Park Ridge (as well as any widening required for the existing road) against our decision to decline the turbines on Game Ridge.

[98] We acknowledged a key distinction between Game Ridge and Hardings Park Ridge and that is, while Game Ridge is currently undisturbed, the integrity of Hardings Park Ridge has already been broken by the water catchment access road. Further, the widening and realignment of this road would be essential if MRP was to have access to construct the turbines both along the ridge and beyond it with, by our estimate, the potential for these turbines (including WT45) to generate up to about 80MW of electricity.

[99] In the final analysis, we decided that, if the vegetation clearances required for the turbines and the road along Hardings Park Ridge were to be accepted, there would need to be a number of provisos.

[100] First, WT44, WT45 and WT46 would need to be relocated close to the water catchment access road to remove the need for the vegetation clearances which would be required for the construction of the turbine access roads.

[101] Second, MRP would be required to undertake a number of environmental offsets. The first of these would be the total restoration and rehabilitation package proposed by MRP elsewhere on the site and as discussed in a later section of this chapter. In doing so, we have taken into account that this restoration and rehabilitation package was proposed as an offset for the adverse effects of *all* of the vegetation clearances proposed by MRP for the turbines on Game Ridge, Back Ridge (South) and Hardings Park Ridge where we have declined the construction of all turbines.

[102] The second offset would be the requirement for MRP to undertake the rehabilitation with native vegetation of those sections of the existing water catchment access road which will become redundant once the two new realignments have been put in place.

Finding on Remaining Turbines

[103] Attachment WBS8 of Mr Shaw's evidence-in-chief identifies a further 14 turbines (WT11 and WT15–WT27) as being located in indigenous vegetation. He noted that these are on relatively easy terrain in the reserve close to the existing water catchment access road. Mr Shaw has assessed that the platforms for these turbines will require some clearance of horopito-dominant vegetation but that the 'minor adverse effects' from the clearances can be readily remedied or mitigated.

[104] In our consideration of MRP's Draft Report request to reinstate WT15–WT20, we revisited our earlier analysis of the ecological evidence and findings for these turbines. For ease of reference, we have consolidated, in a section at the end of Chapter 13 of this Final Report, our (modified) findings from this further ecological analysis with our findings on the landscape and visual amenity analysis for these same turbines.

[105] The balance of the turbines in the reserve are located clear of indigenous vegetation, and for these, as with all of the turbines on private land, Mr Shaw considers that the resulting effects will be very minor. We have no disagreement with Mr Shaw on his assessments and conclusions for all of these remaining turbines.

The Issue of the Current and Former Pine Forest

[106] Here we discuss MRP's proposal to manage a natural reversion process for 75 hectares of the current and former pine forest at the north-eastern end of the wind farm site, with this being directly attributed as mitigation for the vegetation clearances required for the construction of the wind farm.⁵⁹ In doing so, we note that this proposal for the reversion of 75 hectares was predicated on approval being granted for the original wind farm layout proposed by MRP. Further, we note that the reversion project involves approximately three times the amount of vegetation that had been proposed to be removed under the MRP redesign.

[107] The area is discrete and clearly identifiable. Management would include:

- preparation of a natural reversion plan for the overall area (75 hectares);
- site preparation, plant ordering, propagation, delivery, layout and planting for revegetation of 10 hectares of the 75 hectares);
- monitoring of the revegetation area, follow-up management; and annual weed control across the whole of the natural reversion area

⁵⁹ Gabites, EIC para 110.

of 75 hectares for 10 years, including the removal of wilding pines as well as other ecological weeds;

- control of browsing pests to protect plantings and areas of natural regeneration (for up to 10 years, as required).⁶⁰

[108] Ms Gabites in caucusing (1) suggested that the 75 hectares of indigenous vegetation MRP was proposing to plant is not really mitigation because the city's management plan for the reserve is going to provide for that anyway.⁶¹ Ms Gabites also states that the plantations along South Range Road have substantial native undergrowth and support a wide range of birdlife (her own observations included kereru, tui, blackbird, fantail, silvereye, grey warbler (riroriro), whitehead and magpie). And she observes by virtue of the way the pines were planted in the 1970s, and the high levels of light penetration now, that there are mature broadleaf native trees as well as tree ferns, ground ferns, climbers, scramblers and cabbage tree species within the plantations, and she considers these make a substantial contribution to the indigenous ecosystems of the reserve. This we saw in some of the photographic evidence provided by TAG and FOTR and on our own site visit. Ms Gabites proposes leaving these plantations intact, or thinning them to encourage the understorey of native species which would benefit the reserve, together with proposed mitigation, more than just the planting of cut-over barren ground.⁶²

[109] Dr Blaschke also observed he had seen very abundant natural regeneration of a range of native forest in the cleared pine forest areas.⁶³ Mr Shaw, while still supporting the revegetation of the pine forest, at the end of the day, indicated that he had 'a feeling it is not the best use of resourcing for mitigation'.⁶⁴ We can only agree with all three ecologists affirming that much of the plantation forest is regenerating in a quite satisfactory manner now,⁶⁵ with MRP's chief ecologist considering the revegetation of the pine forest is not the best use of resources for mitigating the impact of the construction vegetation clearances.

[110] At caucusing (2) of the ecologists in March 2010, it was agreed that should remaining standing pines be felled on the site, then they should be felled to waste, to minimise disturbance to soils and to provide cover for the future establishment of indigenous species.⁶⁶ In addition, Ms Gabites did not agree that any pines adjacent to indigenous vegetation should be felled, but left to senesce naturally.⁶⁷

[111] When being questioned by Dr Cookson for TAG, himself an ecologist, about how long potentially it would take for the cleared native vegetation to

⁶⁰ Shaw, EIC para 129.

⁶¹ Gabites Caucusing (1) para 21, 19 June 2009.

⁶² Ibid, EIC paras 92 and 111.

⁶³ Blaschke, EIC para 6.11.

⁶⁴ Shaw, NOE 586.

⁶⁵ Ibid, 616.

⁶⁶ Caucusing Report, March 2010.

⁶⁷ Gabites, EIC para 111.

regrow to its present form, Mr Shaw said something along the lines of 70 to 80 years and that the native vegetation to be destroyed (under the original design) was more than adequately mitigated by the proposed 75 hectares of managed revegetation following harvesting of the trees within the pine plantation. But Dr Cookson submits he does not consider MRP is comparing like with like with the revegetation proposed within the pine plantation, because there will be two separate ecological processes in two separate ecological areas. He therefore felt uncomfortable about the use of the pine plantation as a mitigation measure.⁶⁸ We understand from Ms Gabites' evidence that this relates to the question of whether 'low altitude reversion' (on land below 480 metres' altitude) on highly disturbed soils (the pine plantation) can be considered mitigation for the loss of higher altitude vegetation on undisturbed soils where the adverse effects of the development largely occur at altitudes from 480 metres to 620 metres.⁶⁹

Finding for Pine Forest

[112] We have decided that, based on the evidence we heard, irrespective of the number of turbines finally approved for the wind farm, the pine forest should be left to senesce naturally, with wilding pines being controlled as part of the weed monitoring programme.

Rehabilitation of Browns Flat: A Biodiversity Offset

[113] Having reached our finding on the pine plantation forest, we here discuss the alternative to this.

[114] In the '*Ecological Consent Conditions for Turitea*' discussed during the expert caucusing of Mr Shaw, Dr Blaschke and Ms Gabites in March 2010, we consider that Browns Flat might have been in the minds of the experts too, for draft condition 34 of the resource consent (2010)⁷⁰ provided for alternative areas for restoration/rehabilitation – that is – 75 hectares of the existing and former pine plantation **or another area of equitable size**.

[115] Given the TAG and FOTR interest in the avian issues around the pine plantation, and their expert's concern that it be retained, and all three experts' identification that it was regenerating satisfactorily now, we took a keen interest in Mr Shaw's opinion on the rehabilitation of Browns Flat.

[116] Mr Shaw acknowledged he was one of the junior authors of an article entitled 'Halting indigenous biodiversity decline'.⁷¹ He was asked by Dr Cookson for TAG and FOTR to comment on a quotation from that publication in the light of his conclusions on the acceptability of the pine plantation rehabilitated proposal:

⁶⁸ Cookson, NOE 1926.

⁶⁹ Gabites, EIC paras 65, 110.

⁷⁰ Caucusing Report, March 2010.

⁷¹ Shaw, NOE 585.

The idea that New Zealand maintain its biological diversity while continuing to draw down its already depleted stock of indigenous ecosystems has no foundation in ecological science. For local authorities to fulfil their RMA function to provide for maintenance of indigenous biological diversity they would need, for a start, to halt the ongoing clearance of indigenous vegetation and loss of habitats of indigenous species. This means capping loss at current levels.⁷²

[117] For reasons which we suggest as this chapter develops, to cap the loss of native vegetation in the reserve we consider attention should be given to the rehabilitation/restoration of Browns Flat as a biodiversity offset.

[118] At the first part of the hearing, Mr Shaw considered Browns Flat to be the best location for mitigating potential effects from the wind farm. He gives an example of what he meant as 'restoration' of the area as the planting of 10 metres either side of the swampy stream network to create nearly 50 hectares of riparian restoration works in addition to planting small podocarp stands similar to those that existed previously. (We note ariparian revegetation of only 2 hectares of the riparian margins of Browns Flat came through to draft condition 36.3 of MRP's (28 March 2010 Resource Consent Condition) document but that was in the context of keeping the revegetation/rehabilitation of the large pine plantation as part of a condition of consent.)

[119] Browns Flat is about 200 hectares, currently comprising mainly exotic grasses. It is also an open headwater basin and, in parts, there are indications that it carried former stands of dense podocarp forest. It also carries a considerable network of just under 6 kilometres of low-gradient swampy streams as well as swampy margins, and more than twice that length in streams flowing off gently sloping hills.

[120] Mr Shaw acknowledges Browns Flat's easy topography, poorly drained soil, its location in the base of a valley and its exposure to frosty weather. He sees this as being characteristic of sites that are commonly dominated by a mixture of rimu, matai and kahikatea species ... all of which suggest to him a quite dramatically different ecological character from elsewhere in the reserve.

[121] We reflected carefully on this matter (our site visit having confirmed some of Mr Shaw's observations) taking into account that Browns Flat is an area adjacent to part of the native vegetation of the reserve, is part of the water catchment (and in fact it all drains to the Turitea Stream) and appears to already draw a number of water birds to the existing habitat.⁷³

[122] If all of the pine plantation is allowed to senesce naturally,⁷⁴ thus retaining a seasonal habitat for the native birds (including the New Zealand falcon if the species is confirmed as feeding and nesting there), then Browns Flat appears as the ideal alternative biodiversity offset for the use of the reserve by MRP for 35 years.

⁷² Shaw, NOE 585.

⁷³ Ibid

⁷⁴ Gabites, EIC para 93.

[123] In assessing this fact we took into account too the enthusiasm with which Dr Coffey, MRP's ecological adviser on aquatic issues, greeted Mr Shaw's concept plan for Browns Flat. He identified that while MRP had not offered mitigation for the potential effects on the aquatic ecosystem (only minor effects being anticipated), the revegetation Mr Shaw suggested in Browns Flat 'starts from the water margins and works back'. Dr Coffey noted that this would have a directly beneficial effect on the aquatic habitat and would be of a scale that would compensate for any adverse effects on the ecology that might be expected (a somewhat circular argument).⁷⁵

[124] We assessed the restoration/rehabilitation of Browns Flat as an alternative to what MRP proposed in mitigation because it arose through consideration of what Mr Shaw, in particular, had to say about its possibilities together with:

- the Board's and the ecologists' reservations about the need for restoration of the pine plantation;
- our conclusion that we could not make the eco-park proposal part of the conditions of consent for reasons we give below.

[125] We came to this conclusion also because Browns Flat appears to have all the necessary 'building blocks' (in Mr Shaw's opinion) to provide the Palmerston North community with a serious biodiversity offset for the wind farm's intrusion into areas of national significance and yet provide MRP with continued opportunity to harvest the wind resource. It could more realistically in our opinion create a 'no net loss' and 'net gain' solution to the maintenance of biodiversity in the region.

Finding on Environmental Offset

[126] PNCC owns Browns Flat, a relatively discrete area to the south west of the site and unencumbered by any turbines and construction interference because MRP was concerned about its ecological sensitivity early in the planning process for the turbine zones.

[127] In our Draft Report, we invited MRP and PNCC to consider how Browns Flat should be restored as the alternative to the plantation forest, in doing so, to take account of the substantial reduction in indigenous vegetation clearances required within the reserve as a result of our decisions on turbine deletions. MRP's response is identified at para 157 below.

⁷⁵ Coffey, NOE 509.

The Eco-Park Proposal

The Reserves Act 1977

[128] The Reserves Act 1977 is stated to be:

An Act to consolidate and amend certain enactments of the [Parliament of New Zealand] relating to public reserves, to make further provision for their acquisition, control, management, maintenance, preservation (including the protection of the natural environment), development, and use, and to make provision for public access to the coastline and the countryside.

[129] Sections 78 and 80 under Part IV ‘Financial Provisions’ of this Act state:

78. Application of revenue from reserves –

(1) All money received by way of rent, royalty, or otherwise in respect of any dealing with any reserve pursuant to section 42, section 45, section 48, section 53, section 54, section 55, section 56, section 57, section 58, [section 58A,] section 59, [section 59A,] section 61, [section 61A,] section 71, section 72, section 73, section 74, or section 75 of this Act shall –

(a) Where the reserve is vested in an administering body or an administering body has been appointed to control and manage the reserve, be held by the administering body and applied for the purposes of this Act:

...

80. Expenditure of funds –

(1) The funds of an administering body received under this Act shall, save as either authorised [or required] by this Act or any other Act, be applied in purchasing, taking on lease, managing, administering, maintaining, protecting, improving, and developing the reserves under its control, and for no other purpose.

The Proposal

[130] The eco-park proposal is initially described in MRPs’ AEE as:

... [a] unique aspect[s] of a wind farm development at Turitea is that any turbines operating within the Turitea Reserve will generate revenue for PNCC. This revenue will be used to enable a development of an Eco-Park. The Eco-Park will be located in the Water Supply Catchment part of the Reserve, centred around the tawa-dominant forest in the lower catchment. The Eco Park will include pest and weed control throughout the entire Reserve and it will also include parts of Harding’s Park – allowing for more intensive recreational development.

Objectives of the Eco-Park will be to improve ecological values within the Reserve. Although the details of the Eco-Park are yet to be determined, to achieve this objective, a number of initiatives are contemplated. These include:

- Intensive pest control;
- Indigenous revegetation of Brown's Flat (approximately 200 ha);
- Long-term monitoring of the effects associated with pest animal control (including research through university scholarships);
- Reintroduction of a diverse range of threatened indigenous fauna to the Reserve.

Overall, the proposed Turitea Wind Farm represents a mechanism to provide significant improvements to indigenous vegetation cover and habitat condition within the Reserve.⁷⁶

[131] Mr Chris Shaw and Mr William Shaw⁷⁷ for MRP outlined the origins of the proposed contributions by MRP for an eco-park as part of its environmental offset for its development of the reserve – or as Dr Blaschke put it, 'as a form of mitigation' for use and modification of the reserve.⁷⁸ Mr William Shaw is clear that the substantial mitigation package being offered by MRP (as set out above) is entirely separate from the eco-park initiative, adequately mitigating the negative ecological effects of the wind farm with the former.

[132] As part of the history of the eco-park, we were informed that the New Zealand Forest and Bird Society in 2005 had initiated scoping options for an eco-park which was paid for by the PNCC, the council subsequently commissioning its own report on the implications of such a proposal. This report (McNeill, 2005) suggested that such a facility could provide a keystone goal for PNCC's environmental wellbeing strategies and policies. Subsequently, the agreement (October 2006) between PNCC and MRP for the wind farm (described as a 'contract' by MRP) provided for the development of an eco-park, in which MRP is to provide annual contributions to PNCC based on the royalties for the number of turbines in the reserve irrespective of whether PNCC provides its own contributions for the eco-park.

[133] Written submissions from TAG and the FOTR observed that what was proposed was originally more akin to a mainland island, certainly highlighting opportunities retrospectively for the reintroduction of native flora and fauna but also to highlighting public recreational opportunities in an area that currently requires a permit for anyone intending to access the reserve because of the sensitivity of the water catchment.

[134] Mr Chris Shaw explained what happened in the following extract from his evidence-in-chief:

⁷⁶ MRP, *Turitea Wind Farm Assessment of Environmental Effects*, August 2008, p71.

⁷⁷ Chris Shaw, RE paras 4.1–4.5 and William Shaw RE paras 41, 79–82.

⁷⁸ Blaschke, EIC para 6.23.

The Contract of the Agreement provides as follows:

7.1. Ecopark Support

- (a) In partial consideration for the grant of the Investigation Rights, Mighty River agrees, in consultation with Council, to extend at Mighty River's own cost the scope of the technical and other studies (including the studies referred to in clause 5.1(b)) required in support of Mighty River's applications for Resource Consents, to include Hardings Park and other areas of land owned by the Council in the vicinity of the Land as requested by Council, to assist Council in developing the Eco-Park.
- (b) Mighty River will not be required to pay more than \$200,000 plus GST for the studies referred to in clause 7.1(a).

[135] PNCC's commitment to the eco-park, as reflected in the contract, was further outlined in its October 2006 resolutions regarding the change of Reserve purpose to allow for electricity generation. As relevant, PNCC recommended in its meeting of 18 October 2006 that the chief executive be directed:

- (a) To work with the Department of Conservation to develop a comprehensive plan to achieve the best practicable ecological enhancement of the Turitea Reserve so that the indigenous biodiversity of the reserve is actively protected and enhanced for future generations if a wind farm is approved.
- (b) To work with the Department of Conservation to develop legal mechanisms that entrench Council's responsibility to ensure revenue streams from the wind farm are directed in the first instance to ensuring the plan prepared above is achieved and ensure that the Department of Conservation has an auditing function in relation to the fulfilment of the objectives.
- (c) To ensure the mechanism described above will involve the following components:

In recognition of fact that anticipated annual receipts could be in the order of \$1million per annum and in recognition of the costs of an effective pest control programme being up to \$500,000 per annum, income from the Water Catchment turbines shall be applied in the first instance to:

- (i) pest control access across the entire Eco Park comprising the Water Catchment, Hardings Park and Brown's Flat
- (ii) progressive development of the Eco Park until such time as the Department of Conservation is satisfied that pest control can be maintained and that the Council is satisfied the Eco Park is substantially established.

[136] While MRP has accordingly endeavoured to provide as much assistance with the development of the eco-park as possible, primarily through the engagement of Mr William Shaw, this was always clearly understood by the parties as being PNCC's responsibility, as administrator of the reserve. Mr Baker's underestimating appears to be that, if the project proceeded, PNCC would use the revenue for enhancing the ecological processes of the Turitea Reserve as it

resolved in October 2006. He was unable to identify a detailed council-approved plan for achieving the ecological benefits of the eco-park.⁷⁹

[137] In January 2010, Mr William Shaw undertook a further report to PNCC on the eco-park proposal which included:

- an ecological framework for Turitea (creating more diverse biota and much greater intensive pest control programmes);
- provision for recreational development;
- the project management, infrastructure and resource requirements;
- the need for a long-term commitment and indicative costs for establishment (in excess of \$1 million per annum) as well as;
- maintenance costs once the park is established in the order of \$600,000 per annum,⁸⁰ and other financial resources (although we are not sure what form of financial resources this means).

[138] Both Dr Blaschke⁸¹ and Ms Gabites⁸² consider that the eco-park is a PNCC initiative and that the proposal should be disregarded when assessing the positive and negative ecological effects of the application itself. Mr Shaw refutes this approach giving particular emphasis to the contractual nature of the agreement between MRP and the council, while counsel for MRP submitted in closing submissions:

The eco-park is not mitigation for the ecological effects of the Turitea Wind Farm, but forms part of the other benefits of the proposal. It was borne out of the contractual relationship between Mighty River Power and Palmerston North City Council, and requires the payments of royalties from the funds generated by the turbines within the reserve. However, while the PNCC released documents setting out its proposed activities for the management of the Turitea reserve, coincidentally released when Mr Shaw was presenting his proposals for the eco-park development and covering many of those same proposals and indicating the amount of money that [it] intended to spend on the management during this year, we are unaware of any such work being undertaken.

This means that the reserve, although having some low level of pest management, continues to suffer another year of neglect. The council fails to adequately protect an ecological resource, it has held up at this hearing as having great ecological significance to Palmerston North City. It will need money before any action can realistically occur. That won't come from forestry felling and no parts of the forestry reserve can qualify for carbon credits under the Climate Change Response Act or any Kyoto base scheme.

⁷⁹ Baker, EIC para 13 citing PNCC Resolution.

⁸⁰ TAG and FOTR, para 80, p19.

⁸¹ Blaschke, EIC para 6.24.

⁸² Gabites, NOE 562.

Without the assistance of Mighty River Power's royalties it is unlikely that rehabilitation and restoration activities will ever take place in the foreseeable future.⁸³

[139] The Board did not witness any 'low level pest management' on its site visit to the reserve (contrary to what MRP submits). This is because:

- we met and were shown several site activities by PNCC's contracted pest control officer;
- we heard a number of expert witnesses applauding the gradual restoration of the reserve as a result of the current level of pest control;⁸⁴
- we listened to Mr Shaw indicate positive changes in the consolidation of the reserve as a result of 'successful active management of threatening processes, particularly predation'.⁸⁵

[140] But the real point to be made is that the eco-park proposal is not part of MRP's application for resource consent, so this BOI has no jurisdiction to make the offer a condition of consent as an environmental offset to the proposal.

[141] Our assessment of the suggested eco-park therefore begins with the legislation set out above which controls the payment of royalties to the PNCC as administering authority for the use of the resources of the reserve. First, the Reserves Act 1977 s78(1)(a) has a different purpose from the RMA. The former requires the PNCC to control and manage the reserve and apply those functions for the purposes of s78(1)(a) which requires the council to hold any money received by way of royalties (in this case) for monitoring, protecting, improving and developing reserves.⁸⁶ Both counsel for PNCC and Dr Blaschke point out that while such a project has the potential to enhance the ecological values of the Turitea Reserve, which is commendable, the eco-park cannot constitute formal mitigation or qualify as environmental compensation because any such development of an eco-park is in the hands of the PNCC, not the applicant.⁸⁷

[142] While the Turitea Wind Farm Development Agreement⁸⁸ requires MRP at clause 7.1(a) 'to assist PNCC in developing the eco-park', there is no definite contractual duty to do so. Rather it appears to be a statement of intent. Indeed, seen in the context of ss78 and 80 of the Reserves Act 1977 the eco-park proposal simply foreshadows the fact that all the money received by way of rent, royalties or otherwise in respect of dealing, using or developing in the reserve is to be applied for the purposes of the Reserves Act 1977. Section 80 of the Act requires the PNCC to apply any revenue from the reserve to 'maintaining, protecting, improving and developing the reserves under its control'. Counsel for the PNCC

⁸³ Price, MRP Closing Submissions, 4121.

⁸⁴ Blaschke, EIC para 6.14.

⁸⁵ Shaw, RE para 4.

⁸⁶ Ibid, para 82.

⁸⁷ Both Dr Blaschke and Ms Gabites initially appeared to support the eco-park concept seeing it as a potential source of funding for ecological purposes for the life of the consent. See Caucusing Statement (1) 19 June 2009, para 7.2. See also Shaw, RE para 23.9.

⁸⁸ 30 September 2005.

submits the eco-park proposal is in MRP's AEE on the basis that MRP will pay some royalties to PNCC based on the electricity production from the wind farm. It is PNCC's current intention to utilise any such royalties for pest control and the revegetation of areas in the reserve formerly in production forestry⁸⁹ – or possibly replanting for further production forestry.

[143] Dr Blaschke makes the point, and we agree, that there is already a high level of management activity in the reserve and he considers that much, if not most, of this level of management would need to take place anyway, regardless of future wind farm development if the reserve is to continue to function adequately as the city's water supply. He states:

The proposed Eco-park activities merely provide a revenue source for this management. Arguably, therefore, only the level of proposed activities *additional* to required current management could be considered enhancement. Again however, these additional activities are too uncertain to be given any weight in my assessment. It is a long term project of enhancement from unquantified but not insignificant revenue streams, of which the significance and value will depend on decisions and priorities of particular organisations and groups in the future [our emphasis].

[144] Mr Naylor as Mayor of Palmerston North City made it clear that the eco-park agreement could not be entrenched – that is, the council 'cannot commit any future councils to spending the revenue stream on the eco-park. No future body could be bound with things like this'.⁹⁰ And in the light of PNCC's previous intent to restrict the public visiting the reserve to protect a pristine water supply, an eco-park with recreational facilities open to the public as cited above appears to be counterintuitive. Instead, we heard no evidence to suggest that PNCC has any intention of removing this access restriction. We consider the purpose of the RMA should be paramount in this proposal and this includes the health and safety of the people and their general wellbeing. This in part flows from having no ready access to a pristine water supply protected through the restriction of public access to the Turitea Reserve.

[145] It may, however, be just Hardings Park that is the tempting recreational adjunct to the proposal. But that is already open to public.

Finding on Eco-Park Proposal

[146] We therefore conclude that the eco-park proposal, while laudable in some of its objectives, is too uncertain in implementation for us to take it into account as an environmental offset to the ecological effects of the proposal.

[147] We therefore put the eco-park proposal to one side in our consideration of the potential for a wind farm in the Turitea Reserve.

⁸⁹ Maassen, PNCC Closing Submissions paras 66–67.

⁹⁰ Naylor, EIC para 24(c); NOE 910.

Summary of Draft Report Findings on Turitea Reserve Terrestrial Ecology Issues

[148] At this point, for completeness, we bring together the overall findings from our Draft Report on the issues surrounding the terrestrial ecology of the Turitea Reserve.

[149] First, we concluded that the following turbines should be declined:

- WT57–WT66 on Game Ridge;
- WT39–WT43 on Back Ridge (South).

[150] Second, that WT44, WT45 and WT46 would need to be relocated close to the water catchment access road to remove the need for the vegetation clearances required for the construction of the access roads for these turbines.

[151] Third, to offset the substantial clearances of indigenous vegetation required for the construction of the road realignments on either side of WT26 and WT33 for the widening of the water catchment road in the vicinity of Hardings Park Ridge, and for the turbines along this same ridge, the following mitigation would be required:

- the rehabilitation with native vegetation of those sections of the existing water catchment access road which will become redundant once the two new realignments have been put in place;
- restoration and rehabilitation at Browns Flat as discussed in detail in the body of this chapter.

[152] We also concluded that the eco-park proposal should be put to one side in our consideration of the potential for a wind farm in the Turitea Reserve.

Findings Following Consideration of Comments on Draft Report

[153] In its comments on the Draft Report, MRP advised that it was not possible to move the Hardings Park Ridge turbines WT44–WT46 in isolation and that, instead, it proposed that the locations of the turbine zones for WT35–WT37, WT44 and WT46 should all be slightly modified to accommodate the relocation of WT44 and WT46 closer to the access road. The Board acknowledges that, notwithstanding the request from FOTR in its comments on the Draft Report for all of these turbines to be removed, the relocations proposed by MRP meet the Board's concerns over the quantum of vegetation clearances required on Hardings Park Ridge.

[154] In addition, the Board acknowledges MRP's commitment to rehabilitate the two sections of the redundant access road as confirmed in a specific condition of consent.

[155] The Board also acknowledges that, following the request in our Draft Report, MRP has reduced all road widths from 10 metres to 7.5 metres with regular passing bays, and a consequent reduction in the areas of vegetation

clearances required. In doing so, we note that the vegetation clearance areas we had calculated in our evaluation of the terrestrial ecology of Game Ridge, Back Ridge (South), Hardings Park Ridge and the water catchment access road had all been based on the original 10-metre road width.

[156] We confirm here our Draft Report findings for the deletion of the Game Ridge and Back Ridge (South) turbines for terrestrial ecology reasons, notwithstanding the reduction in the road widths in these areas and noting that we have revisited the ecology of WT15-WT20 in Chapter 13 of this Report.

[157] In Schedule 2 of the May 2011 draft of the Resource Consent Conditions attached to its comments on the Draft Report, MRP proposed the rehabilitation/revegetation of at least 10 hectares of Browns Flat if the turbines at both the northern and southern ends of the wind farm are constructed. This would reduce to 9.5 hectares if only the southern turbines are constructed and 1 hectare if only the northern end turbines are constructed. These rehabilitation/revegetation areas reflect the amount of indigenous vegetation which would need to be cleared to accommodate each of these options (including the construction of the cross-valley transmission line). MRP has also proposed a condition under which these areas would be reduced by 0.5 hectares if the cross-valley transmission line is not constructed.

[158] The Board acknowledges that the proposed rehabilitation/revegetation areas for each option are consistent with the amount of indigenous vegetation to be cleared for that option and that details of the rehabilitation/revegetation have been appropriately addressed in Conditions 33 to 39 of Schedule 2 of the Resource Consent Conditions.

[159] The Board also confirms its Draft Report decision that the eco-park proposal should be put to one side in the consideration of the potential for a wind farm in the Turitea Reserve.

Chapter 9: Disposal of Surplus Soil

Introduction

[1] The AEE for the redesign noted that there would be some 1 million cubic metres of surplus soil to be disposed of following the completion of the earthworks required to form the wind farm access roads, turbine platforms and the like. As already noted, MRP advised during the course of the hearing that all of this surplus soil will be disposed of in a number of disposal areas to be located outside of the Turitea water catchment.

[2] In this section of our report we examine the locations, sizes and form of these proposed soil disposal areas and their potential effects on the aquatic ecology of the streams in the catchments in which they are to be located. These streams, which feed either directly or indirectly into the Manawatu River, have been identified by Dr Coffey as the Upper Turitea, the Kahuterawa, the Otangane, the Tainui, the Lower Turitea, Matarua Creek and a number of un-named tributaries of the Manawatu River on the northern boundary of the wind farm.

[3] We record from the outset our acknowledgement that the volume of surplus soil indicated above will have reduced significantly as a result of the Board's decision to remove a number of turbines from MRP's redesign layout.

Issues

[4] The key issues surrounding the disposal of surplus soil and the protection of the aquatic ecology of the streams in the soil disposal areas include:

- the existing quality of the streams including their aquatic habitats;
- the ecological integrity of the ephemeral reaches of the streams;
- the ecological integrity of the flowing reaches of the streams;
- engineering of the individual soil disposal areas;
- agreed locations for the soil disposal sites;
- the design and layout of the sedimentation ponds;
- provision for flocculation in the sediment ponds;
- the need for fish passages at culvert sites;
- the proposed conditions of consent for the management and operation of the soil disposal areas.

Experts

[5] The experts who gave evidence on the aquatic ecology of the streams and the engineering aspects of the soil disposal sites were Dr Blaschke (for PNCC),

Messrs James and Levy and Dr Coffey (for MRP); and Dr Joy, a freshwater ecologist (for TAG and FOTR).

Evidence and Discussion

Overview of Ecological Values of Affected Catchments

[6] Dr Coffey's examination of the affected catchments around the proposed soil disposal areas has shown that:

- the upper reaches of the Kahuterawa and Turitea Streams support a very high-quality aquatic habitat that is highly sensitive to reduced water quality and elevated suspended solids loadings;
- the Otangane Stream, Tainui Stream, Matarua Creek and un-named tributaries of the Manawatu River on its northern boundary are of relatively high quality in their downstream reaches where they discharge to the Mangahao and Manawatu Rivers;
- these catchments should be considered significant habitats of indigenous fauna, in accordance with s6(c) RMA.

[7] 'Provision for' in our interpretation of s6(c) means that all possible steps should be taken to protect the sensitive environment by the best practical means at hand (ie, strict conditions leading to mitigation or avoidance of a sensitive site altogether).

[8] Dr Blaschke endorses all of Dr Coffey's assessments on the aquatic ecological values of the streams with specific endorsement of their nationally important status under the RMA, pointing out in addition that:

- HRC recognises that both the Turitea and Kahuterawa Streams have many environmental values as they are listed in Schedule D of the POP for the Manawatu–Wanganui region as 'Sites of Significance for Aquatic Biodiversity' under several categories of significance, including life-supporting capacity, contact recreation, amenity, mauri and trout fishing
- the Manawatu River sub-catchments on both sides of the northern Tararua Ranges (principally the Turitea, Kahuterawa and Mangahao catchments) are part of a river environment classified by HRC as Upland Hard Sedimentary (HRC, 2007b).

[9] Dr Blaschke's conclusion, from examining the habitat and biota records contained in application documents and the technical reports for the HRC's POP, is that these three catchments (excluding the eastern Mangahao sub-catchment) provide most of the best quality habitat and headwaters water quality in the whole of the Manawatu catchment.¹

[10] The catchments that Drs Coffey and Blaschke appeared to have agreed are of lower sensitivity in terms of sedimentation effects are the north-east section

¹ Blaschke, EIC para 7.6.

of Matarua Creek and some of the un-named tributaries of the Manawatu River which are on the north-west footprint of the wind farm. Those areas in the agricultural catchment can be some distance away from permanent flow. Where permanent flow occurs in the headwaters of those streams, they tend to have very swampy reed-dominated communities that act as very effective filters for any solids that may be lost.² The ecologists consider they would be the least sensitive areas in which to put the majority of the soil disposal areas.

[11] By way of contrast, we heard that the Manawatu River is one of the most nutrient-enriched rivers in the world and the current low water quality is acknowledged as a significant regional issue. In fact, Dr Joy considers that the Manawatu River is one of the worst degraded rivers in the world second only to some in China.³

Ecological Integrity of Ephemeral Streams

[12] Dr Blaschke described the potential adverse effects of locating spoil disposal sites near ephemeral streams making the point that headwater courses are often intermittent (or ephemeral) with recent research emphasising the importance of such headwaters to the overall catchment ecological environment.

They offer habitat to aquatic plants and animals even though they may not have running water in them. They are also important in providing drainage and rainfall interception and infiltration in the catchment headwaters and can be a significant contributor of sediment when disturbed. In small catchments these headwaters can therefore have an important influence on catchment hydrology.⁴

[13] Dr Coffey agrees with Dr Blaschke, identifying that the National Institute of Water and Atmospheric Research (NIWA) is now putting value on ephemeral streams as native species headwater catchments and is extending its protection programmes into agricultural catchments. He agrees that such water bodies contribute to the biodiversity of a stream, they are part of its connectivity and that is why they are also recognised during wet weather – they have instream values as well. For this reason, Dr Coffey agrees it is better to have fewer rather than more ephemeral streams disturbed with fill disposal, and he considers it is better to avoid ephemeral headwater sections of the permanent streams in the particularly sensitive catchments.

[14] In rating them, however, Dr Coffey appeared to resile from his enthusiasm for protecting them absolutely, for example, in a rating of 1–10 concluding that the permanent watercourse could be given a value of 8 and the ephemeral section only 2–3.

² See also Coffey, EIC Figure 3, 7.

³ Joy, NOE 2842.

⁴ Blaschke, EIC para 4.40; Coffey, NOE 524–524.

They are certainly not seen as the same value as the flowing ones but they should not haphazardly be filled up if it can be avoided as they have a complementary value.

Ecological Integrity of Flowing Streams

[15] Dr Coffey considers that the ecological integrity of many of the streams identified would not be lost if suspended sediment is released into them. It is his opinion that within a reasonable time they would rehabilitate with the amenity being recreated. Nevertheless, the proposed soil disposal areas should be located in the least sensitive catchments with monitoring of the engineering works in an adaptive management approach. He went on to say that:

- if there was a significant amount of sediment going into a significant stream channel, it could be cleaned out;
- if there was a soil disposal site sedimentation pond full of sediment and perhaps a coagulant, even in a 10-year event, some sediment might be lost but not all ... there would be very dirty water;
- such a situation would possibly require a recolonisation phase for anything up to five months but the area would recover.⁵

[16] We note that these conclusions appear to be at odds with what Dr Joy had to say.

[17] Dr Joy directly addresses the effects on stream biological communities and the effects of suspended and deposited sediment. He states that suspended sediment impacts in many ways, including:

- clogging the gills of fish and stream invertebrates – this can be lethal if it persists for some time but is species-specific and there are no general rules.
- reducing visibility for visual feeders;
- reducing light reaching into the stream for photosynthesis – which reduces algae and macrophytes, thus food availability for invertebrates and fish.⁶

[18] ‘Deposited’ as opposed to ‘suspended’ sediment was a concern of the ecologists; that is, where the sediment that deposits on the bed of a waterway in between the cobbles may stay there for a period of days, months, years or decades. This has been a relatively recent area of work but ecologists are now learning much more about the long-term effects of that deposited sediment on biological communities. Dr Joy considers this to be one of the most pervasive impacts on New Zealand coastal and freshwater environments.

[19] The need for the measurement of sediment was the subject of discussion and some agreement between Drs Blaschke and Coffey, for the research of Dr Joy indicates that deposited sediment can be hazardous with impacts that included:

⁵ Coffey, NOE 516.

⁶ Joy, EIC para 4.1.

- the blocking and sealing of interstitial spaces (the spaces between stones where most stream fauna live or rest);
- sealing of bed surface (colmation) – which isolates interstitial water from overlying river water and underlying hyporheic water (water under the stream bed); movement across the boundary between water under the stream bed and surface water is crucial for stream life in the hyporheic zone;
- degrading or destroying the interstitial habitat for invertebrates and fish;
- degrading fish spawning habitat.⁷

[20] Dr Joy considers that MRP had not placed enough emphasis on these potential deposited sediment effects nor the importance of taking duration into account when considering the effects of suspended sediment. He stressed the need for continuous sediment monitoring and assessment of deposited sediment.

[21] Throughout the MRP documentation, the earlier-mentioned GWRC's Erosion and Sediment Control Guidelines are referred to as the solution to sediment control problems during construction. It is Dr Joy's view, however, that in the Wellington region over the last few years, sediment contamination has become a significant issue for fresh waters and harbours. This suggests that GWRC's sediment guidelines are either not strong enough, or they are not followed by developers or consents are being breached, but probably a combination of all three.⁸ Dr Joy's recommendations include continuous or near continuous monitoring of suspended sediment to encompass the daily variation and/or minimum and maximum values for oxygen, pH and temperature.

[22] In our Draft Report, we noted from Conditions 27 to 29 of the MRP 28 March 2010 Resource Consent Conditions which cover aquatic monitoring that these specific provisions proposed by Dr Joy had not been spelled out. MRP was invited to comment on this when it responded on the Draft Report.

Engineering and Size of Soil Disposal Sites

[23] From an engineering perspective, Mr James identified the following criteria as being important for locating the soil disposal sites:

- sites that are close to where the soil is being excavated to minimise haulage;
- areas with good access;
- areas with sufficient area to allow the establishment of erosion and sediment control measures;
- a preference for flat areas or shallow gullies;

⁷ Blaschke, NOE 534.

⁸ Joy, EIC para 4.1. In his footnotes Dr Joy cites a number of recent studies supporting his evidence. See footnotes 2–9 citing Denton and Robson, 2002: *Erosion and sediment control guidelines*.

- areas that are not currently in pastoral or other productive land use; and
- consideration of the end use of the area.

[24] Mr Levy's preference would be for a number of smaller soil disposal sites rather than fewer larger sites as in his opinion this would spread the risk and it means that the discharge of any potential sediment load to any particular stream would be reduced.⁹

[25] In being questioned by the Board about the advantages of merging smaller disposal sites into a larger one, Dr Joy replied that aggregated larger sites would be more likely to be monitored. And to guard against an extraordinary rain event, which might have severe downstream ramifications for the larger ponds, Dr Joy considered larger sites, although expensive, could be intensely engineered, noting that New Zealand has successfully constructed dams and tailings dams in numerous areas. These larger carefully engineered sites should ensure that there would be no sediment loss in big storms. Dr Blaschke also considered that a smaller number of larger disposal sites would lessen the number of streams affected by soil disposal and that they would be constructed to a higher standard.

Agreed Locations of Soil Disposal Sites

[26] In the final analysis, there was general agreement among the experts for a smaller number of larger well-engineered soil disposal sites located in the upper reaches of those catchments with the least sensitive ecological values.

[27] Following a request from the Board, Beca, in a report dated 16 February 2010 titled *Consolidated Soil Site Geotechnical and Sedimentation Testing and Erosion and Sedimentation Control Measures*, provided details of the locations of the eight soil disposal sites eventually proposed as part of the redesign. Two of these sites are in tributaries of the Kahuterawa Stream, three of the Matarua Stream, one of the Turitea Stream catchment and two in un-named tributaries of the Manawatu River. None of these streams discharge into the Turitea water supply catchment.

[28] The disposal sites, which cover a total area of around 33 hectares, range in size from 0.9 hectares to 8.7 hectares and accommodate volumes ranging from 27,000m³ to 360,000m³.

[29] The Beca report also includes details of a consent condition requiring that disposal areas be at least 25 metres from any permanent water course and another (agreed with Dr Blaschke), requiring stormwater runoff from sites within the Kahuterawa catchment to pass through at least a 10-metre rank grass buffer before reaching an ephemeral water course. We note that this latter provision was not included in 28 March 2010 draft conditions.

⁹ Levy, NOE 354.

Sedimentation Ponds

[30] The Beca report notes that the amount of surface area within a disposal site which is exposed at any one time should be limited to a maximum of 3 hectares per sediment pond and that sediment ponds should have a volume of 3m³ for every 100m² of catchment. We note that these provisions have been carried through to condition 26 of the MRP 28 March 2010 Resource Consent Conditions.

[31] Mr Levy advised that the sediment ponds will be fully engineered as retaining structures and the placement of spoil in the spoil areas will be strictly controlled to avoid instability. In Mr Levy's view, the likelihood of failure will be very low. In contrast to Dr Joy's opinion, Mr Levy gives his support to the GWRC guidelines, when he says this:

Sediment ponds associated with the spoil disposal areas will be water retaining structures, again with proper engineering design. The GWRC guidelines require pond spillways to be able to pass the 1% AEP¹⁰ event without eroding. This is the same standard as is commonly adopted for flood risk management in urban areas, and is more than adequate to manage the risk associated with these structures, which will not contain large volumes of water.¹¹

Flocculation

[32] Put simply, flocculation is the addition of a flocculent to the sediment ponds to help the clay particles in suspension accumulate and settle out more quickly.

[33] Dr Blaschke observed that sediment control methods and devices commonly used in New Zealand have a trapping efficiency for sediment ranging roughly from 50% to 90% with non-trapped sediment having the potential for adverse effects on stream life. He notes that a performance standard of 75% has been identified for sediment control efficiency at the sensitive Browns Flat. Even with effective 'standard' control measures (sediment ponds, grit traps, silt fences etc, as specified in MRP's latest draft of the CEMP), Dr Blaschke considers the trapping efficiency is unlikely to be greater than 75%, and in practice often closer to 50%, unless flocculation measures are in place. To limit any potentially damaging sedimentation of the waterways below the spoil disposal areas, Dr Blaschke therefore recommended flocculation in the sediment ponds in order to improve sediment retention performance.¹²

[34] Mr Vaughan identifies that the use of flocculation is a common approach within the Auckland region where there can be large percentages of clay particles

¹⁰ AEP – Annual Exceedance Probability that an event of a given size will be equalled or exceeded in any year.

¹¹ Levy, RE para 6.8.

¹² Blaschke, EIC para 6.7(c).

in soils.¹³ In this context, there was a difference in opinion between Mr Mark-Brown and Mr Levy as to how much clay would be exposed during the construction works at *Turitea*.

[35] Mr Mark-Brown considers that an appropriate form of chemical treatment will be needed due to his assessment of the presence of significant proportions of silt and clay in much of the soil proposed to be earthworked and the sensitivity of the receiving environments and that the need to prevent and minimise discharges of clay and silt had been underestimated.¹⁴ In this he disagrees with Mr Levy's assessment of only limited quantities of clay and silt in the soil to be placed in the soil disposal sites.

[36] On the other hand Mr Levy, when discussing the soil types, concluded that:

... there is a relatively small silt and clay fraction in most of the soils that will be encountered. Flocculation is most suitable where there are significant proportions of fine-grained soils ... given the nature of the soils on this site I do not envisage that flocculation will be needed.

[37] Mr Levy does not see a parallel between the soils on this site and Auckland's deep clayey soils where flocculation is commonly used. Nevertheless, he acknowledged that some of the spoil, particularly from those areas located in the deeper soils on farmland in the west, may contain clay that in the sediment ponds will be best settled with this method.¹⁵

[38] Whilst acknowledging that there may be specific situations where some sedimentation ponds are best treated with flocculants (usually alum), Dr Coffey considered that spent alum floc is much more of an issue in terms of its potentially adverse effects. As a result, Dr Coffey had no objection to flocculation being considered for the sedimentation ponds provided there is a stormwater bypass for the ponds to be flocculated.¹⁶ But flocculation, he considers, should be assessed on a case-by-case basis.

[39] In caucusing, Dr Blaschke agreed with him on this. While there may be specific situations where some sedimentation ponds are best treated in this way, the ponds will require carefully managed de-silting programmes and diversion channels to ensure there is no washout of spent floc to the headwaters of streams during storm events.¹⁷

[40] We do not consider that the floc may be as damaging as the two ecologists consider if it was to escape into the wider environment. Mr Mark-Brown provided a careful analysis of a review of the use of flocculation undertaken by the Auckland Regional Council and he suggests that it refutes Dr Coffey's analysis (and possibly Dr Joy's also) and we repeat it here.

¹³ Vaughan, NOE 278–280.

¹⁴ Mark-Brown, EIC para 10.2.2 and para 10.2.3.

¹⁵ Levy, RE para 5.2.

¹⁶ Coffey, RE paras 4, 6–7.

¹⁷ Ibid, NOE 493.

The overall conclusion is that there appears to be a small risk to the natural aquatic environment arising from potential losses of unbound residual flocculants from treatment ponds on construction sites. Impacts are likely to be low level and also likely to not be significant in relation to other factors which govern the health of aquatic communities. The benefit of reduced sediment levels in discharges is considered to outweigh the risk of any low level impacts attributable to residual flocculants.¹⁸

[41] In the final analysis Beca, through Mr Levy, has taken a precautionary approach with respect to flocculation. This approach is covered under conditions 26.5 to 26.7 of the 28 March 2010 draft of the Resource Consent Conditions which were carried forward in the May 2011 draft submitted by MRP with its comments on the Draft Report. These conditions require all sedimentation ponds to have provision for retrofitting for flocculation. They also require that representative soil sampling and testing be undertaken both prior to the preparation of the SEMP for a soil disposal site and during soil placement in the disposal area, with flocculation to be provided if the testing identifies that specified settlement rates cannot be achieved for the soil in question.

Culverts

[42] Mr Levy identified that five pipe culverts were required for road construction within the site. The majority of these will be over ephemeral streams at the extreme headwaters of some of the catchments. One, to be located in an unnamed tributary of the Kahuterawa Stream, is over a more substantial permanent watercourse and, as a result, will need to be double piped.

[43] Mr Mark-Brown in his s42A Report discusses issues around the culverts and notes that the CEMP draft of June 2009 sets out useful principles for construction of all works within watercourses but does not include mention of any requirements for fish passages.¹⁹

[44] Having been provided with photographs of the locations of the individual culverts by MRP, Mr Mark-Brown noted that these appear to be at ephemeral streams with relatively low value and that the adverse effects from construction can be expected to be low, provided appropriate erosion and sediment control measures are in place during construction.

[45] Mr Levy points out that, as the culverts will be located mainly in the steep uppermost reaches of what are typically small catchments on ephemeral streams, fish passages will not be required.²⁰ We would agree.

¹⁸ Mark-Brown, s42A Report.

¹⁹ Levy, EIC para 44.

²⁰ Mark-Brown, s42A Report, p15.

Board Consideration of Comments on Draft Report

[46] In its comments on the Draft Report, MRP proposed a number of amendments to the draft conditions of consent for the aquatic ecology monitoring to take account of Dr Joy's concerns which we have noted in paragraph 22 of this chapter. As we have noted in Chapter 5, these amendments also apply to the aquatic ecology monitoring in the Upper Turitea Stream and the water reservoirs.

[47] The Board is satisfied that the proposed amendments to the conditions have satisfactorily addressed Dr Joy's concerns.

Findings

[48] At the start of the hearing MRP identified around 30 potential disposal sites to accommodate around 1 million cubic metres of surplus soil from the construction of the wind farm. These sites were to be located both within the Turitea water catchment as well as in the surrounding catchments.

[49] We also heard extensive expert evidence on the ecological values and sensitivity rankings of the upper and lower reaches of each of the streams within the surrounding catchments. Concern was also expressed over the negative effects that would result for aquatic life in the streams if significant sedimentation escaped from any of the disposal sites into the streams, particularly those assessed as being highly ecologically sensitive.

[50] As the hearing progressed and the evidence unfolded, MRP altered its position and advised that all disposal sites would be located outside the Turitea water catchment. In addition, the number of sites was reduced to eight, each highly engineered and with its own sedimentation pond. All of these sites would be located in the less sensitive catchments or, for the more sensitive catchments, at least 25 metres from any permanent water course with a requirement for stormwater runoff from sites within the Kahuterawa catchment to pass through at least 10 metres of rank grass buffer before reaching an ephemeral water course. A precautionary approach was also developed to allow for flocculation to be introduced on a site-specific basis if soil testing found this to be necessary.

[51] On the basis then that all of the measures contained in the final conditions of consent are fully implemented, we are satisfied that there should be less than minor effects on the ecology of the catchments arising from the disposal of surplus soil from the construction of the wind farm.

Chapter 10: Avian Ecology

Introduction

[1] Under the heading *Fauna, Birds*, the MRP's original AEE sets out the species evaluated and recorded for MRP by Wildlands Consultants, based on a combination of their fieldwork undertaken from 2005–2008, from annual bird surveys undertaken since 2003 by PNCC when predator controls were introduced into the reserve and from existing records from the Ornithological Society New Zealand (OSNZ, 2006).

[2] The AEE also notes that a detailed effects assessment of a preliminary proposal/layout was undertaken by ecological, landscape and visual, archaeological and noise experts. From this assessment a number of turbines were removed or relocated from this layout. In his rebuttal evidence, Mr Wong Too, MRP's wind resource expert, lists a number of factors that influenced the design and layout of the wind farm. These include 'environmental' factors but no detail on these was provided.¹ He did refer to considerations for turbine spacing, but the reason given for those was to minimise wind turbine wake losses and turbulence from neighbouring wind farms.

[3] We could find nothing specific in the AEE confirming that avian (ecological) issues were to the fore in the development of the turbine layout.

[4] Notwithstanding, under the heading *Conclusions to its Ecological Assessment of the Proposed Turitea Wind Farm, Palmerston North*, the *Wildland Report* sums up the ecological effects on birds as follows: 'Effects on fauna are expected to be minor. There is only limited bird use of the wind farm site ...'.²

Submitters

[5] Professor Laurence Craig for MRP in his evidence-in-chief details the consensus of the 55 submitters who were concerned about potential adverse effects on avian issues and gave detailed responses which we incorporate below.

[6] An extensive representation on birds was also made by TAG and FOTR on behalf of a number of interested parties. Footnoting a considerable number of avian authorities, TAG identified a range of concerns on the wind farm proposal. First, the pine tree plantation at the north-eastern end of the site was habitat for a number of New Zealand's indigenous bird species, including the New Zealand falcon. These birds, in TAG's opinion, utilise both intact and cleared pine forest as hunting and nesting habitats. TAG was therefore opposed to clear felling of the plantation as opposed to letting the pine trees fall naturally and slowly opening up the canopy as a habitat for the birds. TAG was also concerned that the proposed

¹ Wong Too, RE para 2.3, 4.

² MRP, *Turitea Wind Farm Assessment of Environmental Effects*, August 2008, *Wildland Report*, para 11.

turbine layout raised serious issues for the safe passage of birds from the south west of the Turitea catchment. It also noted that the terrain of the Turitea Reserve did not lend itself to the easy discovery of birds killed or injured from bird strike. In this context, it considered that the removal of carcasses by scavengers often occurred and that this led to inconsistent reporting of bird collisions on the Manawatu wind farms.³ There would also be a disproportionate effect on the overall viability of the falcon population (endangered) should bird strike from the proposed wind farm take out one of a breeding pair. Finally, TAG considered that the post-construction monitoring proposed by MRP was inadequate.

Issues

[7] A range of issues has been identified in our consideration of the effects on avifauna from the development of the proposed wind farm. These include:

- the potential for mortality or injury resulting from birds colliding with the turbines and associated structures such as power lines and transmission lines;
- the potential for the displacement of birds from the wind farm and immediate areas;
- the potential for turbine barrier effects to force birds to alter their flight lines to avoid the turbines, thereby affecting their energy expenditure and ecological linkages associated with mobile, wide-ranging populations;
- the loss of habitat caused by the construction of the wind farm and associated infrastructure;
- the proposed mitigation measures;
- the proposed bird monitoring programme.

Experts

[8] The experts who gave evidence on the effects of the wind farm on avian ecology (as well as on other ecological issues) were Mr William Shaw (for MRP), Dr Blaschke (for PNCC) and Ms Gabites (for the TAG and FOTR). In addition, Professor Craig gave specialist evidence on avian ecology on behalf of MRP.

Evidence and Discussion

[9] Ms Gabites provided for TAG and FOTR details of an assessment process which follows protocols developed in New Zealand and Australia for the siting of wind farms. This includes interpreting the vegetation and land uses of the site with respect to wildlife habitat, and checking for the presence of threatened or

³ Professor Craig and Mr Shaw differ in their reporting of the numbers of Australian harrier hawk reported as killed by bird strike in the current Manawatu wind farms (1 or 2): Shaw, EIC paras 87, 31. Craig, EIC paras 35, 12.

rare plant species in areas that may be affected by earthworks; secondly, ascertaining seasonal variation in wildlife populations present across the site or travelling through the site, by using local knowledge, interpretation of the habitats and seasonal surveys, and interpreting whether these populations may be jeopardised either in the short term or during the life of the wind farm; if threatened or keystone wildlife species are found to be present, undertaking targeted baseline data collection of their populations and behaviour; and continuing seasonal general and focused surveys for a number of years after the wind farm becomes operational to check whether unanticipated adverse effects are occurring.⁴

[10] As an example of the application of the first protocol, Ms Gabites identified the bird species present in the Turitea pine plantation which is proposed to be cut down and the land restored as part of MRP's mitigation programme. She notes that these are not mentioned in the *Wildlands Report* and nor is the existing vegetation that supports the birds.⁵

[11] Ms Gabites also noted the absence in the AEE of a seasonal picture of bird behaviour within the wind farm airspace using local knowledge and interpretation of the habitats on which to base a low-risk turbine layout design; that 'New Zealand' is not yet monitoring post-operational effects on wildlife and so is forced to base mitigation of effects on 'conservative risk minimisation'; and that the MRP suggestion that risks are minimal because few birds are killed on wind farms is mischievous in the absence of adequate surveys and investigations.

[12] Ms Gabites also considered that the combined risk factors from wind farms for keystone and threatened species are high, including concentrations of flights within rotor sweep, flight corridors and the proximity of turbines to breeding and feeding habitat. She outlined avoidance strategies for these risks include setbacks, relocation or removal of turbines and probably turbine turn-off.⁶

Potentially Affected Bird Species

International Migratory Birds

[13] From the initial literature reviews, the *Wildlands Report* indicated that the only international migratory bird species likely to be present at *Turitea* are the shining cuckoo (*Not Threatened*) and long-tailed cuckoo (*At Risk – Naturally Uncommon*) (Miskelly *et al*, 2008). Surveys undertaken by Wildlands included checking for the cuckoo and waterfowl on the lagoon. This field work confirmed the presence of the shining cuckoo, which migrates between New Zealand and the northern Australia–New Guinea region. Mr Shaw for MRP considers this species is likely to cross the Tararua Ranges, or travel the length of the range as part of its migration, but there is no evidence that it crosses the ridges. While the species is present on a seasonal basis it does not favour habitats in those locations. The long-tailed cuckoo, which migrates between New Zealand and many islands in

⁴ Gabites, EIC para 143.

⁵ Ibid, NOE para 40.

⁶ Ibid, EIC para 22.

Oceania, may also cross the Tararua Ranges or travel its length as part of its migration, although there is no record of this. To date, there have been no reports of any cuckoo being killed as a result of the construction and operation of a wind farm, including those wind farms already in operation on the Tararua/Ruahine Ranges.⁷ Professor Craig suggests that there is no evidence that these species disperse above the canopy where they would be likely to encounter turbines. Given the species present and their migratory patterns, Mr Shaw concludes that the proposed wind farm will not be an issue for international migratory birds.

New Zealand Migratory Birds

[14] Mr Shaw discusses that OSNZ (2006) acknowledges that there is very limited data on local migration patterns in the Tararua Ranges to assess the impact of wind farms. Local resident species and migrants (ie, species that migrate within large territories or seasonally to local feed sources in New Zealand) that are identified include tui, bellbird, kingfisher, kereru, kākā, falcon and rifleman. Tui and bellbird (*Not Threatened*) are seen as unlikely to utilise ridge crests on a regular basis. Kākā (*Acutely Threatened – Nationally Vulnerable*) and kereru (recently removed from the *Threatened Species* list) are itinerant visitors. The latter are present in low numbers, and in Mr Shaw's opinion mainly inhabit the tawa-dominant forest in the lower valley away from proposed turbine zones.⁸

Forest Birds (Native and Introduced)

[15] The majority of birds found during the surveys undertaken at *Turitea* are forest birds. There are bellbird, silvereye, grey warbler, fantail, whitehead and a range of introduced finches. Professor Craig considers, of these, only silvereye may be at (minor) risk if they disperse in flocks through the rotor-swept area of a number of turbines. The magpie, an introduced species (known to prey on native bird and lizard species), may be at higher risk from turbines as suggested by the bird strike results from the nearby turbines in the Manawatu. Strikes have been also reported for introduced species such as blackbird, song thrush and chaffinches. In Professor Craig's view all other species spend the majority of their time within the canopy and will have very low risk of mortality.⁹

New Zealand Falcon

[16] The New Zealand falcon is a nationally vulnerable species.¹⁰ Mr Shaw told us that falcon commonly nest and/or hunt in felled pine plantation immediately following harvest, when chaffinches and a range of other small birds that use these habitats for feeding are present and can be clearly seen by the

⁷ Powlesland, R.G. *Bird species of concern at wind farms in New Zealand*, para 2.17, 36. DOC Research and Development Series 317, Department of Conservation, Wellington, citing Robertson *et al.* Powlesland notes the long-tailed cuckoo is found in the forests (native and exotic) of the Tararua and Ruahine Ranges.

⁸ Shaw, EIC para 97.

⁹ Craig, EIC para 38.

¹⁰ Ibid, EIC para 18, citing Miskelly *et al* (2008).

predator. Mr Shaw acknowledges that there have been a scattering of falcon sightings across the overall *Turitea* site and a slightly higher frequency in the Browns Flat area and at the end of the water catchment access road, although he has found there is no evidence of nesting. In very windy environments, such as the Turitea Reserve, Mr Shaw's evidence is that falcon hunt very low to the ground and well below the blade strike zone.

[17] Ms Gabites, from her personal observations for two other proposed Manawatu wind farms, has observed falcons flying long distances to access preferred hunting grounds at any elevation with suitable topography. She disputes Mr Shaw's opinion that falcons only fly at a low level over vegetation, claiming that they can fly higher when hunting birds and in moving to new hunting grounds and that they could therefore be at risk from turbine strike.¹¹ She was also able to identify that the frequency of falcon sightings in the Turitea catchment had risen sharply in 2008 to 11%.

[18] Professor Craig for his part observes that New Zealand falcon are in fact present at a number of wind farms, but thus far no deaths or near collisions have been observed. Citing a personal comment made to him by one observer, he states the New Zealand falcon is a highly agile bird which has been seen moving between turbines. This behaviour contrasts with the other raptors seen internationally which are larger and slower and therefore prone to blade risk.¹² Professor Craig notes that this mobility distinction has not been noted by Dr Blaschke or Ms Gabites.

[19] While Mr Shaw has seen no record of falcon fatalities connected with wind farms, Professor Craig discusses that the falcon is apparently placed at risk of electrocution with increases in the number of electrical poles and wind farm related facilities, such as transformers and uninsulated conductors. He identifies that the transmission companies are placing bird spikes on power poles, while transmission lines are strung under cross-arms to minimise the risk of electrocutions.¹³ Mr Shaw observes if there is still a perception of risk from MRP's project, these mitigation techniques could be installed at *Turitea*.¹⁴

[20] The flying height of the New Zealand falcon is of particular significance when considered against the height of the blade sweep of the proposed turbines. If the falcons do inhabit ridges, they could risk blade strike, although as noted by Professor Craig, they are highly agile birds and this agility (peculiar to the New Zealand species only) should offset some of this blade strike risk.¹⁵

¹¹ Gabites, NOE 675.

¹² Craig, EIC para 42. We note Figure 3 (a)–(e) in a submission by FOTR #629 on the redesign (18 March 2010) which illustrates a New Zealand bush falcon family resident in the Turitea Reserve.

¹³ Ibid, para 42, citing Powlesland (2009).

¹⁴ Shaw, EIC para 103.

¹⁵ Craig, EIC para 42.

[21] Another important factor to the survival of the New Zealand falcon will be MRP's intent to undertake predator control. The proposed funding of research through Massey University may also lead to further mitigation measures.¹⁶

Kereru

[22] Professor Craig identifies that kereru make courtship flights above the forest canopy at nesting areas and also fly over open ground when moving between seasonal food sources.¹⁷

[23] But Professor Craig in his rebuttal evidence pointed to two kereru studies of four to six years' duration, with which he is familiar, that did not show kereru flying more than 25 metres above the ground (which they would have to do in windy weather to encounter a wind turbine). In one study of foraging behaviour, they typically flew at a height of between 3 metres to 15 metres above ground when commuting between feeding areas. In that study, if they were feeding, they flew slowly, close to the ground and at canopy level. Professor Craig pointed out there is substantial international literature to support the notion that animals do not waste energy when moving between food sources (presumably for kereru by flying at turbine height).

[24] Ms Gabites has worked in the Kahuterawa and Tokomaru catchments close by to *Turitea* for a number of seasons. She considers that, in late December to March, there will be a lot of kereru activity in the *Turitea* catchment on a daily basis because of the food sources available there.¹⁸ She also suggests that, in windy weather, kereru may fly to higher levels at about the height of a rotor blade when crossing the ridge.

[25] Another researcher cited by Professor Craig is undertaking regular bird counts in the *Turitea* Reserve for her doctorate research. She has observed occasional sightings of kereru crossing the ridge close to the ground in calm weather (when the turbine blades would not have been moving).¹⁹ Professor Craig concludes that Ms Gabites' suggestions of high flights by the kereru do not have support from either theory or direct observation.

[26] But Dr Blaschke cites an instance where, in 2007, a kereru was observed to be in near collision with a wind farm transmission line at *Te Apiti*, so Ms Gabites' concerns about potential bird strike for the kereru cannot be dismissed out of hand.²⁰ We also note Ms Gabites' personal sightings in the Manawatu (over weeks throughout all seasons) of kereru and tui including their behaviour.²¹ We agree with her that local observation of avian activity in the

¹⁶ Blaschke, NOE 665.

¹⁷ Craig, EIC para 30.

¹⁸ Gabites, NOE 676.

¹⁹ Shaw, EIC para 107, says kereru do not favour horopito-dominant ridge habitats so there appears to be some conflict with Professor Craig's evidence.

²⁰ Blaschke, EIC para 4.25, citing Rochel Keedwell (2008) *Tararua Wind Farm Bird Monitoring – T3 project. A report for TrustPower Limited*, paras 2, 8–9.

²¹ Craig, EIC para 30.

locality of the wind farms is important. We also note that the knowledge of other researchers' information from Professor Craig was new evidence in rebuttal. Ms Gabites was not challenged on her difference of opinion on that information when she was cross-examined and we give some weight to her evidence.

[27] What also emerged from Ms Gabites' cross-examination is that in her evidence during the *Motorimu* case she stated that kereru (and New Zealand falcon) are at low risk because they were at very low levels (at that time). And she acknowledged to counsel for MRP that the *Table of Average Counts and Frequency for all Species* (Exhibit 7A) indicates that the presence of kereru over the years 2003–2008 fluctuates and is currently declining in surveys taken in the spring. But Ms Gabites goes on in re-examination to clarify that, in her experience, kereru is firstly drawn to pigeon wood which is present at the site and begins fruiting in mid-to-late December, followed by another preferred tree, tawa, which fruits peaking in late February and March. So it depends when the surveys are undertaken – spring is not summer.²²

Tui

[28] Tui move on a regular basis between feeding areas and have been seen flying high above the canopy circling and then flying together to a new feed source (Stewart and Craig, 1985). Professor Craig acknowledges that it is not known whether tui behave in this way at this site, but it is his view that it is unlikely to occur and therefore the risk of blade strike for tui is low.²³

[29] Also, by way of contrast to kereru, tui have robust populations and wide distribution and for that reason will be of low risk.

Water Bird Species

[30] Of relevance to this project are the water bird species which may be found on the Turitea reservoirs, some of which are also recorded in the New Zealand Threat Rankings. The water birds likely to be present in the vicinity of the reservoirs include grey duck (*Nationally Critical*), bittern (*Nationally Endangered*), New Zealand dabchick (*Nationally Vulnerable*), marsh crake, spotless crake (*Relict*) and black shag, little shag and little black shag (*Naturally Uncommon*). It is possible that a small number of these water birds may disperse across lower areas of the wind farm site, such as Browns Flat, where there are wetlands, although such movements are not recorded in the *Wildlands Report* (where it is also stated no migratory waders have been recorded at *Turitea*).²⁴ It is, according to Professor Craig's experience, unlikely that these water birds will fly anywhere near the majority of turbines on the ridges.²⁵

²² Gabites, NOE 696–697.

²³ Craig, EIC para 11.

²⁴ Shaw, EIC paras 36.

²⁵ Craig, RE paras 19, 7.

[31] We have concluded from the evidence we have read that the risk of water birds colliding with the turbine blades is likely to be minimal.

Bats

[32] Ms Gabites identified that long-tailed bats are known to be in low numbers in the neighbouring Kahuterawa and Tokomaru valleys where they have been recorded both within the mature forest and adjacent to the pine plantation. Ms Gabites considers that bats preferentially frequent mature native forest and edges during their active foraging season and it is therefore highly likely they are present in the Turitea catchment.

[33] Bat surveys were undertaken at various intervals from 2005–2008, and two automatic bat/detection recording devices in the Turitea Reserve have recently been installed. Ms Gabites identifies that the original receivers, which were used before the applicant's evidence was tabled, had a 50-metre range and were only useful under open sky. She considers that this limits the survey routes and may not provide a fair sample of bat activity within the wider catchment – particularly in the vicinity of the turbines adjacent to native forest adjacent to the ridgelines.²⁶ But, to date, no bats have been seen or recorded.

[34] We make no findings on bats in the Turitea Reserve but note they have specifically been included in the monitoring conditions.²⁷

Bird Strike

[35] Professor Craig, from his studies, considers high bird kills from wind farms are typically associated with the older overseas wind farms which do not compare with the turbine type or layout proposed for *Turitea*. He suggests deaths here will be few because bird densities are relatively low, are predominantly of introduced species and will not affect the local populations. Overall, he considers that effects from the development on bird mortality will therefore be acceptably low.²⁸

[36] Ms Gabites points out that there have been no methodologies for assessing bird strike in New Zealand. There are keystone bird species resident in the reserve and, according to protocols (both present here and in Australia), this should trigger more detailed monitoring to determine the behaviour or requirements of these species.

[37] Powlesland in his report for DOC (2009) confirms there have been underestimates of the deaths of large birds from bird strike, as well as reportage of as little as 25% of small bird deaths as these are based only on found corpses without accounting for scavenging by other animals. As well, he notes that

²⁶ Gabites, EIC paras 152, 26.

²⁷ MRP, 28 March 2010 Draft Resource Consent Conditions paras 44–49.

²⁸ Craig, EIC para 16.

identification has been by non-specialist observers.²⁹ Mr Shaw also noted that the *Wildland Report* draws on past sampling of birds in the Turitea Reserve and bird counts for one season only and agrees that this report does not take account of possible potential seasonal movements which could better help determine potential risk to birds.³⁰

[38] Professor Craig also agreed that there is no evidence as to differences in bird species and densities between the proposed turbine zones and acknowledged that these would be helpful in estimating if some zones may put more birds at risk than others.³¹

[39] Professor Craig recognises that raptors (falcons, harriers, hawks, eagles, owls and so on) 'appear to be especially at risk' (from turbine collisions). As some raptors tend to be naturally found in low numbers, even a small mortality risk can adversely influence population viability.³² Dr Blaschke reflects these concerns about birds that are at high risk (ie, those that are endangered) at *Turitea*. He makes the point that the relative risks of effects on birds need to be examined more closely because a very small number of collisions of some rare or threatened species is likely to be of greater significance than a larger number of collisions of the more common species.³³ Ms Gabites speaks in a similar vein.

[40] The wind farms north of *Turitea* (*Tararua 1, 2, and 3, Te Apiti and Te Rere Hau*), which have a requirement for ongoing monitoring of bird kills, reported 10 deaths over a period of five years prior to 2007. All deaths were introduced magpies, despite native birds such as paradise duck, tui, kereru, falcons and harrier hawk using the area. This is a death rate of approximately 0.02 per turbine per year, which Professor Craig identifies is below the reported lower end of the range for turbine deaths worldwide.

[41] It is his opinion that if the current results from the *Tararua* and *Te Apiti* wind farms are extrapolated to *Turitea*, up to 20 bird deaths per year could be expected from collision with turbine blades. In contrast, he notes that the loss of eggs as well as both young and adult birds to introduced predators within the area of the wind farm will be at least a magnitude of 10–100 times greater in the same period. Any form of pest control undertaken within the proposed envelope will therefore markedly reduce this figure forming an effective mitigation of any perceived bird losses from blade strike.³⁴

[42] According to Dr Blaschke, Professor Craig's suggestion that up to 20 deaths per year could be expected from collision with turbine sites at the site would represent a significant absolute number of bird deaths, especially if this

²⁹ Powlesland RG, *Impacts of Wind Farms on Birds: A Review*, Department of Conservation, Wellington, 2009. Professor Craig is aware of one systematic mortality study not yet published: Craig, RE para 2.2.

³⁰ Shaw, EIC Plates 2-6, *Wildland Report* 2009, Attachment WBS3 *Site Photographs*, p82.

³¹ Craig, RE para 2.3.

³² Ibid, EIC para 25.

³³ Blaschke, para 4.22.

³⁴ Craig, EIC para 44.

number includes any of the threatened or uncommon bird species (such as the New Zealand falcon or kereru).

[43] The difficulty with Professor Craig's predictions, as Ms Gabites points out, is that neither the *Tararua* nor *Te Apiti* wind farms from which the mortality statistics are taken are within dense and mature native forest like *Turitea*, which contains such a number of diverse bird species.

[44] Ms Gabites also observes that the aerial display behaviour of tui and kereru commonly occurs within 80 metres of mature forest edges and falcon and harrier hawk frequent forest edges. She notes that, on other wind farms, consent conditions have been agreed for turbine blades to be setback 80 to 100 metres from tall forest (especially the podocarp/tawa forest). For *Turitea* there are a number of turbines proposed that have envelopes abutting forest edges, which she considers makes birds more vulnerable to blade strike.

[45] Professor Craig rejects this approach. He considers the key point to note is that these behaviours would need to occur near ridges (which is very uncommon) and to a height of at least 25 metres which neither he nor researchers had ever seen. And while he acknowledges some turbines are near forest edges they are in fact located on ridges, and this forest is predominantly low horopito-dominated scrub (which is not favoured as a habitat).

[46] He acknowledges too that there have been conditions requiring setbacks for turbines imposed at other consented wind farms but sees no defensible justification for this for *Turitea*. In his opinion, because turbine blades must practically be at least 12 metres above any canopy to avoid turbulence (Mr Philip Wong Too, pers. comm.), there is already adequate distance for birds to avoid turbine blades.

Barrier Effects

[47] Ms Gabites identifies that the original wind farm layout completely encircles prime terrestrial habitat for several native species which also includes water bodies that attract waterfowl.³⁵

[48] In making this observation, Ms Gabites' attention had been drawn to the Powlesland Report, which recommends that the turbine spacing should be no closer than 200 metres to allow avoidance. We requested a copy of that report and read it because it was cited to us a number of times. It contains important information to be recognised by all potential developers of wind farms. But specifically on the point in question here, we note Powlesland says this:

The configuration of turbines at onshore facilities is most often dictated by the wind resource, and thus far no one has examined how overall wind farm configuration may affect birds. Percival (2001) considered that, in general, spacing between turbines should be greater than 200m in order to avoid inhibiting bird movement (barrier effect).

³⁵ Gabites, EIC para 20.

This recommended distance is also often the amount of spacing required by industry to reduce wake effects of large turbines on neighbouring turbines (Kingsley & Whittam 2005).³⁶

[49] In Figure 7 of her evidence, which was based on the original turbine layout, Ms Gabites drew attention to what she considers to be five anticipated and observed high-frequency kereru/tui/ bellbird flight corridors through the perimeter of the proposed wind farm. In doing so, Ms Gabites considers that these five corridors require the deletion of a total of seven turbines. From her Figure 7, she has identified these turbines as being, for the first corridor at the southern end, WT32; for the second corridor along the eastern ridge, WT23 and 42; for the third corridor towards the north-eastern end, WT7, 108 and 109; and for the fourth corridor at this same end, WT97. There are no turbines in the fifth corridor identified by Ms Gabites.

[50] While acknowledging that all of these flight corridors largely equate with saddles which may be used by birds, including the kereru, Professor Craig is critical of Ms Gabites' Figure 7, suggesting it has been deliberately drawn using wide lines and extending the corridors up and over adjacent high points seemingly in order to try to include a number of turbines.³⁷ (It was not clarified with Ms Gabites whether this was true or not.)

[51] Professor Craig also points out that MRP's 'encircling' turbines criticised by Ms Gabites are in fact widely spaced and hence there is not a barrier to movement as the closest turbine spacing (270 metres) offers at least two times the total blade diameter (90 metres), with in many cases the distances between turbines being far greater (from 500 metres to 1.4 kilometres). He also notes that such design features fully accord with best practice in turbine placement internationally and that it is 'walls' of immediately adjacent turbines and multiple rows that provide little chance for birds to avoid rotating blades.

[52] For our part we note that Ms Gabites 'barrier' concerns will in fact be avoided through a combination of MRP's redesign and the Board's decision to remove a number of turbines:

- for the first corridor at the southern end, all of the turbines will be removed for landscape and/or ecological reasons;
- for the second corridor along the eastern ridge, all of the turbines in the vicinity of WT23 and 42 will also be removed for landscape and/or ecological reasons;
- for the third corridor towards the north-eastern end in the vicinity of WT7, 108 and 109, WT108 has been removed by MRP under the redesign and in any case with our removal of the turbines south of WT15, this will open up a long length of open ridgeline for bird movements across the ridge;

³⁶ Powlesland RG, *Impacts of Wind Farms on Birds: A Review*, Department of Conservation, Wellington, 2009.

³⁷ Craig, RE para 2.4.

- for the fourth corridor at the north-eastern end of the wind farm in the vicinity of WT97, following the redesign, there is a gap of at least 500 metres between WT97 and its western neighbour;
- finally, there are no turbines in the fifth corridor identified by Ms Gabites.

[53] We are satisfied that, with these changes, all of Ms Gabites' concerns on barrier effects have been responded to.

Disturbance and Displacement

[54] Displacement of birds as a result of changes in habitat and visual disturbance is a further potential impact from wind farms, which can have both negative and positive effects.

[55] Professor Craig observes that from international experience there is not a clear pattern of habitat and visual disturbance effects on bird species. Some raptors and a range of other species are displaced from areas with turbines and hence preferentially feed elsewhere. A few other land birds appear to increase in the vicinity of turbines.

[56] Powlesland records that the majority of recent studies in Britain have found no disturbance effects (Percival, 2000) and that there is an increasing body of evidence that wind farms generally do not affect bird distribution.³⁸

[57] Nevertheless, Powlesland also records that relatively long lines of turbines or large wind farms can become important barriers to the local and seasonal movements of birds (Langston and Pullar, 2003). And that the effect of birds altering their flight paths or migration routes is a form of displacement.

[58] There was no evidence before the Board to make this assumption here.

Potential Loss of Habitat

[59] Mr Shaw considers that while indigenous birds may be affected by the loss of habitat during the construction and placement of turbines and the associated infrastructure, as construction is confined to ridge-top vegetation, effects on mobile bird species are likely to be minimal. In the Turitea Reserve there is the potential to considerably mitigate any habitat loss by increasing the area of indigenous habitat for birds and as well through the more intensive control of pest animals.

[60] Mr Shaw and Professor Craig propose that habitat loss will be recompensed or mitigated through the proposed restoration of 75 hectares of forest, the implementation of further mitigation measures with respect to

³⁸ Powlesland, RG, *Impact of wind farms on birds*, para 4.3, p20.

predation control and the availability of potential funding from MRP for graduate research on habitat displacement and blade strike.³⁹

[61] For her part, Ms Gabites points out that it is likely to take at least 20 to 25 years to establish a forest canopy and that this will not provide habitat for at-risk forest species for at least half the lifetime of the wind farm consent. Also the forest restoration will not provide habitat for waterfowl, hawks and gulls.

[62] Mr Shaw disclosed that he ‘seriously had not considered this’ issue, adding ‘... it may take very active management in terms of reintroduction of some of those former tree species into selected sites in the reserve’. Thus Mr Shaw not only appears to confirm Ms Gabites’ concern, but equally (very surprisingly) does not appear to have given much thought about the restoration that can be achieved.⁴⁰

[63] Dr Blaschke’s vegetation map demonstrates the degree to which the private forests and the pine plantation impinge on the turbine layout (and vice versa). As an example, under the redesign, eight turbines are encompassed by the pine plantation.

[64] At least half of the Turitea wind farm is located on pastureland which in turn is not only adjacent to native forest but also to plantation forests. The other half of the wind farm is located in the native forest itself.

[65] Ms Gabites was challenged as to whether the pine plantation provided a feeding and breeding habitat for the falcon. She states this partly arose out of Mr Shaw’s evidence (which we were unable to identify) and partly because she is aware that falcon in the Kaingaroa Forest (in the North Island) nest within mature pine forest as well as in the cut over and four-year old rotations.

[66] There is thus an indication that falcon utilise the pine plantation and that it is also used as a habitat by other species. We were told that there is 20 hectares of remaining pine plantation which was established in the 1970s either by replacing a previous rotation or planting in cleared broadleaf scrub. Ms Gabites told us that the latter areas in particular have relatively prolific native undergrowth of ferns, vines and understorey trees and shrubs, encouraged by high light penetration into the remaining blocks of pine. The small fruit-bearing trees and shrubs attract birds such as silvereye, blackbird, bellbird and tui during the fruiting season. It is also her opinion that the pine canopy provides feeding and breeding habitat for insectivorous bird species (fantail, tomtit, grey warbler, whitehead, silvereye, shining cuckoo, morepork) and for falcon as well as roosting for kereru.⁴¹

[67] Ms Gabites goes on to say that it can be seen in the clear-felled plantation areas that, once exposed, most of these previously sheltered, shade-tolerant

³⁹ Craig, NOE 642. He acknowledges it will be hard to monitor bird strike where low scrubby forest exists in the vicinity of turbines, but where pasture exists (on the west and north east) of the reserve it will be possible.

⁴⁰ Shaw, NOE 584.

⁴¹ Gabites, EIC para 31.

species become stressed or die, although their seeds provide a flush of young growth after several years, from which a minimal selection of the hardier, light-demanding species will regenerate. The felling earthworks disturb, dehydrate and consolidate the topsoil, encouraging the rapid spread of exotic adventives, weeds and pasture grasses, with wilding pines rapidly regenerating.⁴²

[68] If 75 hectares of plantation forest is felled in this reserve, as Ms Gabites has noted, this may negatively affect the current bird life and it is unknown where this birdlife, which she maintains visits the area, would move to. Powlesland says that off-site mitigation can involve actions taken to increase the security of at-risk species at sites away from wind farms (Percival City, 2003; Smallwood, 2004; Kuvlesky *et al*, 2007).⁴³ This might involve creating or improving habitat near a wind farm to encourage birds to use it rather than the wind farm site.

[69] We discussed the issue of the proposed restoration of the pine plantation in more detail in Chapter 8 of this report.

Cumulative Effects

[70] Dr Blaschke considers that because of potential impacts it is important to consider the average effect of each turbine and the cumulative effects of the total number of turbines and associated structures as well as the cumulative impacts of other wind farms in the range of the bird population, particularly when rare or threatened species are concerned.

[71] This issue is very difficult for this Board to ascertain although we would expect that such cumulative effects should be picked up through the monitoring programme discussed below. Certainly, the paucity of bird strike so far reported from this area is encouraging.

Monitoring Issues

[72] In its submission, DOC, in a section entitled *Adverse effects on avifauna and bats and their habitats*, identified that the wind farm proposal has the potential to adversely affect local avifauna and bats through turbine strike, habitat destruction and displacement effects. It named the native birds it considers at risk to be the kereru, tui, kākā and bush falcon.

[73] DOC considers there has been inadequate pre-construction monitoring to determine the level of effects on the named species; has concerns about cumulative adverse effects from this proposal and from previously consented wind farms; and considers that precedent arises given the scale of the proposal and its associated effects and risks. DOC also provided a list of proposed conditions to address the actual and potential effects of the proposal on avifauna and bats as well as signalling that it believed agreement could be reached with MRP over its concerns.

⁴² Gabites, EIC para 32.

⁴³ Powlesland, RG, *Impact of wind farms on birds*,.

[74] Counsel for MRP identified that when talking about the mitigation of bird deaths at *Motorimu*, Ms Gabites had proposed the monitoring of bird use of the wind farm area; the reporting of deaths at selected turbines (presumably because once identified as being in the wrong place these could be turned off at selected times or disestablished); and the study of the falcon because of its small and threatened population.

[75] When counsel for MRP queried whether she would consider the same criteria for monitoring avian issues at *Turitea*, Ms Gabites responded that she supports similar criteria as they are essential mitigating techniques.⁴⁴ Dr Blaschke, who considers a relatively low but potentially significant cumulative effect of the wind farm on some native bird species, acknowledges that risk can be reduced to a minor level if there is a detailed monitoring and research programme in place, such as that foreshadowed by MRP and DOC.⁴⁵

[76] We are pleased to note that these concerns have been taken account of in the MRP 28 March 2010 Resource Consent Conditions where in Schedule 2, paras 44 to 64, there are extensive conditions for pre- and post-construction avian and bat monitoring. The pre-construction surveys, to be developed in consultation with the regional council and DOC, are to extend over four consecutive seasons concluding with a final report which identifies methods to avoid, remedy or mitigate any adverse effects of the wind farm on threatened avifauna species and/or threatened bat species.

[77] The post-construction surveys are to be undertaken for a minimum of 12 consecutive seasons after commissioning of the wind farm, with annual reporting of the results of the monitoring and a final report provided to the regional council and DOC with recommendations on measures to avoid, remedy or mitigate any adverse effects of the wind farm on threatened avifauna species and/or threatened bat species.

Board Consideration of Comments on Draft Report

[78] Following a review of the comments received on the Draft Report, the Board has concluded that no modifications or clarifications are required to its Draft Report findings on avian ecology.

Findings

[79] At the start of this chapter we identified a range of issues which we considered needed to be addressed for their effects on avifauna. In brief these were:

⁴⁴ Gabites, NOE p693.

⁴⁵ See *Statement of Agreement Reached in Caucusing* by William Shaw, Paul Blaschke, Isobel Gabites and John Craig, 19 June 2009, para 17.

- the potential for mortality or injury resulting from birds colliding with the turbines and associated structures such as power lines and transmission lines;
- the potential for turbine barrier effects to force birds to alter their flight lines to avoid the turbines;
- the potential for the displacement of birds from the wind farm and immediate areas;
- the proposed mitigation measures;
- a bird monitoring programme.

[80] Apart from the kereru, about which we have some considerable reservation, we have concluded that the risk of blade strike for other named species does not appear to be major. And for those that are at risk (such as magpies) these are likely to be predators on New Zealand's native species and removing them will in fact benefit the local population – a point made by Professor Craig. He and Dr Blaschke were not concerned about the (low) numbers of magpie, harrier hawk and blackbacked gull deaths which might suffer from blade strike or collision – taking into account their overall populations. Overall, blade strike or collision for these birds was, for Dr Blaschke, an acceptable risk.⁴⁶

[81] We also acknowledge that there is quite extensive spacing between adjoining turbines and that many turbines have been removed from the original layout as a result of both the MRP redesign and our own evaluation. As well, we note that *Turitea* is not in the path of a large number of migrating birds. And we note too that the one raptor which is critically endangered in New Zealand is the national falcon and it, unlike its international relatives, is very agile. This will assist with its avoidance preferences.

[82] Having considered all of the evidence, the obvious question to ask here is whether, given the gaps in the knowledge about the seasonal movements of the birds in the Turitea Reserve and the habits of two of its rare species, together with the existence of the wind farm, can the two be sustainably managed?

[83] We conclude that the answer to that will be found from the findings of the comprehensive monitoring programme included in the Resource Consent Conditions and, from this, the response of MRP to the findings in the context of the layout and operation of the wind farm.

⁴⁶ Blaschke, NOE 649.

Chapter 11: Public Opinion Surveys

Introduction

[1] Wind turbines have been part of the near-environment of the Manawatu for well over a decade and now stretch some 11 kilometres from near Wharite Peak on the South Ruahine Range down the crest of the North Tararua Range to a point near Palmerston North. The proposed Turitea wind farm would extend this line of turbines a further 14 kilometres along the Tararua Ranges. Turbines would also be located on the foothills of the ranges in close proximity to many residential properties.

[2] MRP sought to strengthen its case for building the proposed wind farm by introducing the results of a public perception survey it had undertaken of Palmerston North residents. PNCC also presented findings of a social impact survey it had undertaken.

Submitters

[3] Individual submissions not supporting the application centred on various issues raised in the Summary of Submissions – Turitea Wind Farm Project¹ and came mainly from those living in relative close proximity to the wind farm.

Issues

[4] The key issues arising from these public perception and social impact surveys were:

- the robustness of the survey methodologies adopted by each of the experts;
- the absence in the surveys of any assessment of the social environments and social effects;
- the inability of the experts to undertake any meaningful caucusing to resolve the differences in the findings of each of the surveys;
- the differences in levels of support of those surveyed between those living remote from the wind farm with those living on the Turitea foothills;
- the degree to which the results of the surveys might be used to establish support or opposition for the wind farm.

¹ Hill Young Cooper, April 2009.

Experts

[5] Evidence on these surveys was submitted on behalf of MRP by Emanuel Kalafatelis, a research and evaluation expert with over 35 years' experience, and for PNCC by James Baines, a professional social impact assessor with some 20 years' experience. MRP also engaged Dr Peter Phillips, a social science researcher to provide supplementary and rebuttal evidence. Rebuttal evidence on the potential social impact of the wind farm submitted by Deborah Burns on behalf of MRP was ruled to be inadmissible by the Board and was not heard. An s42A report was prepared for the Board by Julie Meade Rose, a social anthropologist with 30 years' experience in social and environmental planning.

Evidence and Discussion

Kalafatelis Public Perception Survey

[6] Mr Kalafatelis outlined the results of his public perception survey undertaken in 2009 of a representative sample of 601 residents aged 18 years and over living within 15 kilometres of the proposed wind farm.

[7] His main findings were:

- compared to other methods of generating power, wind was most frequently identified by respondents as the preferred method (71%). Against this background, 78% of all respondents supported the building of wind farms in the Manawatu area in general, while 87% supported their building in New Zealand;
- 27% of all respondents were aware of the proposal to build a wind farm at Turitea; this increased to 85% after prompting;
- three times as many respondents supported the proposal to build a wind farm at Turitea (60%) as opposed the proposal (18%);
- amongst those residents living in the Turitea Valley (a sub-sample of the whole), 48% supported the project compared with 45% who were opposed to it;
- reasons given for support were that the wind farm would use a natural, clean, renewable and/or sustainable resource, that wind power is a good option, and that more power generation is needed;
- the main reasons given for opposing the project were the negative impact on the environment (particularly in relation to the Turitea Reserve area), that there are already a number of wind farms in the area, and the negative visual impact of a wind farm.²

[8] At the request of the Board, Mr Kalafatelis further interrogated the results of his survey to isolate the sub-group results for residents living in the

² Kalafatelis, EIC File 1.

Turitea foothills area closest to the wind farm. In a memorandum to counsel for the applicant,³ Mr Kalafatelis made the following points:

- the sub-group of people living in the Turitea Valley was made up of 56 people.
- the population living in the foothill areas of interest accounts for around 50% of the overall valley population or 1.1% of the people living in the overall survey catchment area.
- of the 56 people interviewed in the Turitea Valley, 16 could be said to live in the foothill areas and of these, 4 (or 25%) supported the proposal while 11 (or 69%) opposed it.
- of the balance of the 40 people interviewed who lived in other areas of the valley, 21 (or 58%) supported the proposal compared with 16 (or 38%) who opposed it.
- if the survey of people living in the foothills had been known to be a particular requirement, the survey and its sample would have been differently constructed.

Baines Social Impact Survey

[9] Mr Baines was among a group of experts engaged by PNCC to carry out an independent assessment of the effects of the wind farm proposal. His specific role was to lead the social impact assessment of the proposal. His overall finding was that community support for wind farming in the Manawatu near Palmerston North, whilst still strong, was at a tipping point. For instance, 82% of respondents agree/strongly agree that the Manawatu region should make a contribution to New Zealand's sustainable energy future. Somewhat more residents (49%) are against further wind farm development compared with 41% who are in favour. Mr Baines concluded that granting consents for the entire MRP proposal, which would have the effect of 'saturating the ridgelines east of the city with the sight of turbines' would be considered by the majority of the wider community to be a non-sustainable use of resources, and non-enabling for the community to provide for its social and economic wellbeing in the broadest sense.⁴

Survey Methodologies

[10] Before considering the findings of the public perception and social impact surveys undertaken by each of the experts, we need to record that there was considerable debate between Mr Kalafatelis and Mr Baines on the applicability of the two types of survey, the way in which each was conducted and the relative merits of their individual findings. As the approach for each type of survey was fundamentally different, it was not surprising to us that they expressed trenchant criticism of one another's results. In addition, most of Dr Phillips

³ Memorandum to Helen Andrews, Chancery Green, from Emanuel Kalafatelis and Kelvin Lange, Research New Zealand, *Proposal to Build a Wind Farm at Turitea, Mighty River Power Limited*, 7 October 2009.

⁴ Baines, EIC 5E on s42A (2009) Report.

supplementary and rebuttal evidence was a critique of Mr Baines' survey methodology and subsequent results.⁵

[11] The differences also made caucusing very difficult. The following extracts made by Mr Kalafatelis during his oral evidence, indicate this.⁶

I was unable to meet Mr Baines physically, but we did manage to caucus by telephone. As limited methodological information had been provided in his primary evidence with regard to the research that he was referring to in that evidence, I had developed some concerns with the research that he was using, particularly with regard to his technical robustness.

I did request in writing some additional information from Mr Baines with regard to the technical aspects of his research, but what was provided was insufficient, particularly insufficient in order for me to establish with some certainty that the research he was referring to and, in fact, drew conclusions from, was representative. This is a critical point because obviously no valid conclusions can be drawn if the research, in the first place, is not representative of the population that it is supposed to represent. As a result, as we moved into the caucus, I was particularly concerned to engage him in conversation in order to establish whether, in fact, his research was indeed representative. Unfortunately, as a result of our discussions I was not able to walk away from that dialogue and feel that, in fact, his research was indeed representative. He was unable to provide me with sufficient technical evidence at that point in order for me to come to that conclusion.

In the end we really only agreed on two particular points; the first point relates to an attempt that he was making in his primary evidence to compare the Palmerston North City Council panel survey with the results of the survey that we conducted on behalf of Mighty River Power. He was making comparisons in his primary evidence between these two surveys in an attempt to show that his research, that is the Palmerston North City Council panel research in particular, was more robust than ours and therefore better reflected public opinion.

As I have already explained, I had some concerns with the representativeness of that survey. He was unable to satisfy me of the technical aspects of that survey when we finally caucused and therefore we concluded, we agreed that he should not make any comparisons between those two surveys; that was the first point that we agreed on. The second point that we agreed on was with regard to references that he had made in his primary evidence to the effect that residents that he had interviewed in the Turitea Valley had held strong negative views about the proposal. If one reads more carefully the information relating to the research that was done with those residents, you will also see that the same residents also made some strong positive comments about the proposal.

⁵ Phillips, RE, Revised RE and SE.

⁶ Kalafatelis, NOE 405.

So we agreed, Mr Baines and I agreed that in future any reference to the views held by Turitea Valley residents should both reference the fact that they held strong positive and negative views. That is where we got to.

S42A Report

[12] Ms Meade Rose in her s42A Report was critical of the social impact survey undertaken by Mr Baines. She comments that his citizens' panel survey is not random in that the sample was selected from the telephone book (when the 2006 census identified that 11% of Palmerston North City residents did not have a telephone) and that the panel survey was conducted over the internet (when well over a third of the population did not have access to the internet). She also considered that Mr Baines had over emphasised results where small numbers were involved and that some statements in the survey were made without statistical certainty including that the wider community is saying that enough is enough and that in a cumulative sense the balance of public opinion is clearly at a tipping point.

[13] Conversely, for Mr Kalafatelis' survey undertaken on behalf of MRP, it was Ms Meade Rose's opinion that the information about public perception was valid, that the conclusions drawn were robust and that there were no shortcomings in his evidence.

[14] Overall, with respect to the surveys, Ms Meade Rose was also critical that the AEE did not include an assessment of the social environments and social effects of the proposed wind farm as she considered that this would have provided more robustness for the conclusions reached. We note in the closing legal submission for MRP that counsel also commented that 'In retrospect, it is a pity that MRP and PNCC never discussed the possibility of a robust Social Impact Assessment to support the project'.

Redesign

[15] The TAG/FOTR closing submission⁷ included concern of an alleged claim by MRP that the lack of community submissions on the redesign was indicative that the majority of the community who initially submitted were no longer opposed to the redesign and that MRP has either alleviated their concerns or accepted the mitigation proposed.

[16] On 9 February 2010, an instruction was posted on the MfE Turitea Wind Farm website and emailed to submitters advising that submitters who made a submission on the original application could submit on the redesign. The instruction went on to say that the content of these submissions should be restricted to only new matters arising from the revised design and should not repeat information already included in the original submissions and those submissions already heard by the Board.

⁷ TAG/FOTR Closing Submission, paras 22–23.

The Board wishes to assure TAG and FOTR that its evaluation of the revised design has taken full account of all submissions received both for the original design and for the redesign. In doing so, the Board does acknowledge, however, that the redesign process in which a number of proposed turbines were deleted will have in part addressed the noise and intrusiveness concerns of at least some residents.

Board Consideration of Comments on Draft Report

[17] Following a review of the comments received on the Draft Report, apart from the need for one editing correction identified by MRP, the Board has concluded that no modifications or clarifications are required to its Draft Report findings on the public opinion surveys.

Findings

[18] We repeat here Ms Meade Rose's concern that MRP's AEE did not include an assessment of the social environments and social effects of the proposed wind farm, her criticism of Mr Baines' survey, and her general support for Mr Kalafatelis' survey. But she did not comment on planning, public health, noise or visual and landscape perspective as 'less significant' than other effects!⁸

[19] Also, we note the criticisms of each other's surveys by Mr Kalafatelis and Mr Baines.

[20] Our findings on the surveys have not been greatly influenced by these concerns. We have also resisted the temptation to attempt to quantify with any certainty what the actual level of support for the wind farm might be. For example, different respondents could well have made different interpretations in their responses to descriptors (in the Kalafatelis survey) such as *somewhat oppose*, *neither support nor oppose/no opinion* and *somewhat support*. These same responses could also have been interpreted differently from what the respondents intended during the evaluation of the survey results and also the surveys did not touch the nerve centre of what has disturbed residents in this case.

[21] In her closing legal submission for MRP, counsel presented MRP's view of public opinion:⁹

... there is a strong body of support for the Turitea Wind Farm. Rather than it being a project that a community is universally opposed to, as many submitters would have you believe, this is a project that a lot of people want to see developed and operational.

⁸ Meade Rose, s42A Report (2009) para 4.

⁹ Price, MRP Closing Submission para 4.34.

[22] We have drawn the conclusion that, while the surveys may indicate general public support for the wind farm they appear not to relate to many of the issues of significance to the affected residents in this case.

[23] Thus, in our view, there is a second and more important qualification on the level of public support for the proposal. This is based on the marked reduction in support from those residents who live close to the wind farm¹⁰ in a further analysis by Mr Kalafatelis. Even if we accept Mr Kalafatelis' qualification that there was only very limited survey sampling, the reduction in the level of support from these closer residents is still very clear:

- from the 601 residents surveyed in the *total survey catchment area*, Mr Kalafatelis has concluded that three times as many support the proposal to build a wind farm at Turitea as oppose it;
- for *all residents living in the Turitea Valley* (a sub-sample of the whole), 48% support the project and 45% oppose it;
- for *those who live in the foothill's area of the Turitea Valley*, 25% support the proposal and 69% oppose it.

[24] There are two other matters addressed in more detail in other chapters of our report which relate to the public opinion surveys. The first of these is referred to in the closing submission for MRP where counsel states:

It has been acknowledged by Mighty River Power from the outset there are potential adverse effects, and in respect of landscape and visual effects, they are significant. However, they are predominantly local effects. The Turitea Wind Farm is a proposal that must be assessed on a national scale, and it is Mighty River Power's submissions that on balance, the proposal's site-specific effects are considerably outweighed by its significant positive effects and national benefits.¹¹

[25] In this context, we repeat here our observation (discussed in more detail in Chapter 4) that Dr Layton is sceptical as to how the public perception surveys might be used to evaluate a particular effect from the construction and operation of the wind farm. He notes that he did not undertake a non-market valuation of the community's willingness to pay because, in his view, their inherent uncertainties would lead to a lack of reliable guidance in weighing up the evidence of such effects.

[26] We also consider we have no information on which to assess the impact of *Turitea* on a national scale, particularly in view of our findings in this Final Report.

[27] Thirdly, our findings from the public perception and social impact surveys do not support Mr Wyatt's hierarchy (as set out in Chapter 12) for dealing

¹⁰ Memorandum to Helen Andrews, Chancery Green, from Emanuel Kalafatelis and Kelvin Lange, Research New Zealand, *Proposal to Build a Wind Farm at Turitea, Might River Power Limited*, 7 October 2009, pp 4–5.

¹¹ Price, MRP Closing Submission.

with adverse landscape effects for a turbine. That is, if screen planting does not work then, in Mr Wyatt's view, the adverse effects would in all cases be mitigated or outweighed by what he believes to be a strong level of public support for the Turitea wind farm. Whilst we have noted that there appears to be an overall level of public support, this is clearly influenced by where the respondent residents live. Unlike Mr Wyatt, we have not concluded that an unqualified level of public support actually exists.

[28] We comment in more detail on Mr Wyatt's evidence in Chapter 12 of this report.

Chapter 12: Landscape and Natural Features

Introduction

[1] The Turitea Reserve is topographically defined by rolling land at its northern end, two parallel ridges down its western and eastern sides, with the former breaking part-way along to form the outlet for the Turitea Stream, and rolling land at its southern end. The majority of the land is covered in regenerating native vegetation, with more mature vegetation being located within the enclosed valley between the parallel western and eastern ridges. Areas of pine plantation, much of which has been recently cut, are located in the north-eastern aspect of the Reserve, while small areas of pine plantation remain uncut in the north-western corner. Pastoral land is located in an adjacent area to the east that falls within Tararua District, and pastoral land also lies adjacent to the Reserve in the north, west and south-western areas. The Reserve is thus seen in the context of a pastoral setting, although part of the inner slopes and high points of the water catchment area can be clearly seen from Palmerston North city, with their dense cover of native vegetation.

[2] To the south west of the Turitea Reserve lies the plateau wetland of Browns Flat, which is owned by PNCC. Extensive waterways cross the plateau and drain into the Turitea water catchment, feeding water into the stream that drains into the upper reservoir from the south. While the plateau maintains a generally open pastoral character, there are groupings of exotic trees as clusters and shelter rows that have been planted within the open grassland.

[3] To the south of the reserve lies the 868 hectares Hardings Park, a scenic reserve since 1997¹ and owned by PNCC. This reserve is open to public access, which is gained via the walking route of Sledge Track that ascends from the end of Kahuterawa Road. Sledge Track reaches the summit near Red Rock Knob, which is located at the northern end of Hardings Park near the southern boundary of Turitea Reserve.

[4] Hardings Park abuts Tararua Forest Park, which in turns runs the length of the Tararua Ranges to the south, ending near Upper Hutt. The Forest Park has a narrow northern finger that runs east of Hardings Park and extends past the southern boundary of the reserve, ending just south of Marima, which is a high point on the eastern ridge of the water reserve. This means that, in terms of cadastral boundaries, the Tararua Forest Park is contiguous with the Turitea Reserve along its south-eastern flank, and also abuts Hardings Park on its eastern and southern boundaries. There is minimal difference between the landscape character of the Forest Park, parts of Hardings Park, and the water reserve, despite there being three cadastral distinctions. The significance of this in terms of landscape effects is discussed below, with Mr Brown concluding that the main ridges of Turitea are part of a continuum that stretches across the Tararua Forest Park which is a focal feature in views from Palmerston North.

¹ Naylor, EIC para 8.

[5] Within the application site, the extent of the turbines proposed by MRP is 12 kilometres from north to south. This is similar to the extent of existing turbines from the Manawatu Gorge south, which includes the three Tararua wind farms (*T1, T2, T3*) and the *Te Rere Hau* wind farm. In total, these four existing wind farms have 231 constructed or consented turbines. They comprise three different turbine heights, two styles of towers – lattice and tubular – and both two-bladed and three-bladed wind turbine generators. When the 55 turbine *Te Apiti* wind farm is taken into account, which lies north of the Manawatu Gorge, the existing wind farms extend 16 kilometres along the ranges and total 286 consented or constructed turbines.² The *Turitea* proposal would extend this to 28 kilometres and, under the redesign, take the total number of constructed or consented turbines to nearly 390.

[6] The proposed Motorimu wind farm extended 5 kilometres south of *Turitea*. The consent for *Motorimu* was surrendered by MRP part-way through the *Turitea* hearing.

Submitters

[7] Chapter 13, Landscape and Visual Amenity Effects, identifies submitter concerns on these matters. This current chapter should be read in the context of that but, because what we are concerned with here is the identification of largely legal/factual issues, we make the submitters concerns a cross reference only.

Issues

[8] The key landscape and natural features issues arising are as follows.

- Is the *Turitea Reserve* an outstanding natural landscape (ONL) and/or outstanding natural feature (ONF) under s6(b) RMA?
- Is the skyline of the *Turitea Reserve* an outstanding natural feature (ONF) under s6(b) RMA?

Experts

[9] Expert evidence was presented by seven landscape architects, and numerous submitters also gave detailed accounts of the meaning of the landscape to them and the effects they anticipated the proposed wind farm would have. These submissions were not limited to those opposing the wind farm, although such submitters were by far in the majority, but also included positive submissions from several members of the public and landowners on whose land the turbines would be located. The experts who presented evidence were Messrs Allan Wyatt, Stephen Brown and Brad Coombs for MRP, Mr Clive Anstey for PNCC, Mr Shannon Bray and Ms Diane Lucas for submitter groups and Ms Julia Williams as a s42 author. With the exception of Mr Coombs, who

² Bray, EIC para 76.

focused his comments on the application in relation to the regional policy context, all other experts addressed the issue of effects on both natural character and amenity. Within this framework, Ms Williams' assessment was limited to a review of all the other experts' work rather than an independent assessment of her own, but she did reach conclusions regarding the appropriateness of the proposal by evaluating their work and found in support of the evidence of Mr Anstey on effects.

[10] All experts agreed that the proposed turbines were not objectionable as objects, with several experts acknowledging their sculptural form. Mr Brown held the view that they would appear to float above the natural landform and vegetation, their sculptural white profiles melding with the sky,³ while Mr Anstey described them as being quite beautiful.⁴ This apparent appreciation of their form and appearance, yet objection by some experts to their proposed presence, appeared to cause confusion for some within the hearing. Such a position, however, is entirely tenable, as the issue in this chapter is not the attractiveness or otherwise of the turbines, but their appropriateness in terms of effects on natural character and the skyline landscape, which is an entirely site-specific question and determined by reference to the legal criteria in the RMA and the applicable planning framework.

[11] Of the seven landscape architects who appeared, all were New Zealand based except for Mr Wyatt of Environmental Resources Australia Pty Limited. He brought fresh approaches and presented alternative views to some of his counterparts on a number of fronts in terms of the appropriateness of the turbines and mitigation. All landscape architects appearing are experienced practitioners, and their evidence is discussed below.

Evidence and Discussion

MRP

[12] Mr Brown for MRP was the practitioner with the longest involvement in the project. He undertook an initial regional assessment for the applicant, completing this in January 2006. This assessment focused on 63 turbines within the Turitea Reserve, although, at the time, he acknowledged that the wind farm was likely to extend into adjacent privately owned farmland.⁵ He assessed the effects from 15 viewpoints that represented a wide and representative range of physical locations within the Turitea wind farm site's visual catchment and related audiences.⁶ The results of this assessment were that the overall impact ratings would range from moderate to moderate/high.

³ Brown, Exhibit 9 *Turitea Wind Farm Preliminary Assessment of Landscape and Amenity Effects*, January 2006, p41.

⁴ Anstey, NOE 1566.

⁵ Brown, Exhibit 9 *Turitea Wind Farm Preliminary Assessment of Landscape and Amenity Effects*, January 2006, p2.

⁶ Ibid, p18.

[13] Mr Brown undertook a further assessment in 2008, addressing a proposal for the maximum of 131 turbines, both within the Turitea Reserve and on adjoining private properties. In the preparation of his evidence-in-chief, Mr Brown undertook a region-wide assessment to determine outstanding and amenity landscapes. He included the finding of this assessment in a table to that document, along with comprehensive maps illustrating the boundaries of these areas. He identified a total of 17 outstanding landscapes and 72 amenity landscapes. Additionally, he identified a range of 'other' everyday working landscapes. He concluded that both ONL and amenity landscapes are largely residual landscapes; they essentially comprise remnant locations and features that exist within a heavily modified, almost entirely rural, working landscape.⁷

[14] Prior to commencement of the hearing in July 2009, caucusing was undertaken by experts in their respective fields. Mr Brown did not participate in this exercise.

[15] He did, however, prepare two rebuttal statements of evidence, one in June 2009 and the second in August 2009.

[16] In February 2010, Mr Brown completed a supplementary statement of evidence regarding the redesigned wind farm. The result of this was to reduce the number of turbines proposed for *Turitea* from 122 to 104. In undertaking this work, he was given a wide brief to consider what modifications he considered would be necessary to respond to particular issues raised during the hearing and further reduce the project's direct visual and landscape effects.⁸

[17] A total of 12 turbines were removed from the vicinity of Bryant Hill, one near South Range Road and a further five in the area of Love Ridge and Browns Flat. Many others were shifted to varying degrees. Mr Brown was of the opinion that this dramatically reduced the level of intrusion and dominance in relation to Ngahere Park and, to a less obvious extent, reduced the presence and dominance of the turbines when viewed from Polson Hill Road and Pahiatua Track. No mention was made of any reduction of effects in terms of outstanding landscapes, and the witness acknowledged that the area around Red Rock Knob would remain affected by adjacent turbines but to eliminate these effects a substantial number of turbines would need to be removed and this needed to be balanced against the effects that did occur.

[18] He concluded that while the revised layout substantially reduced the project's landscape effects, it would be very difficult to achieve appreciably more positive outcomes without making major changes to the entire project.⁹ He reiterated this in questioning, stating that short of totally removing the wind farm proposal from the Tararua skyline, which was not within the true ambit of the process he had been involved in, differences would remain between the

⁷ Brown, EIC para 50.

⁸ Ibid, NOE 3007.

⁹ Ibid, SE February 2010, para 24.

views of the various landscape experts and others in relation to the revised proposal's effects.¹⁰

[19] Mr Wyatt was engaged by MRP in April 2008 to provide advice on the assessment of the landscape and visual considerations associated with the project. Throughout his involvement, he advised the project team with respect to design, location and effects issues.

[20] Mr Wyatt discussed the landscape units that made up the area and their sensitivity to change. He divided the area into five units based on geographical distinctions, then considered the sensitivity of each unit and viewers to change. He considered three main factors affected sensitivity: location, rarity and scenic qualities. High sensitivity ratings were given to landscape units that lack modification, are rare or are dramatic.

[21] He differed from Mr Brown as to whether the Tararua Ranges and back ridgeline of the Turitea Reserve, as framed in the view south along Fitzherbert Avenue, symbolised what could be described as a signature feature of Palmerston North. Additionally, he stated that he did not think the Turitea Reserve was really visible from Palmerston North.¹¹

[22] Mr Wyatt provided rebuttal and supplementary rebuttal evidence. This did not bring new issues to light, but was more focused on restating why his opinions were well founded.

[23] When the hearing adjourned in October 2009, Mr Brown was engaged by MRP for the redesign of the wind farm. Mr Wyatt participated in this exercise, evaluating the effects of the layout that Mr Brown recommended. Mr Brown gave evidence at the resumed hearing in March 2010, while Mr Wyatt prepared evidence and some updated photo simulations but was not called to present this in person or be available for cross-examination.

[24] Mr Coombs undertook a review of the landscape aspects of the HRC's POP for MRP. He gave evidence in relation to the assessment criteria and process for identifying ONL and ONF in the POP, and on specific provisions relating to the skyline of the Tararua Ranges. He found that a full detailed assessment of the region was required before ONL and ONF can be identified and that boundaries for these shown in Schedule F of the POP cannot be relied upon for a site-specific application.

[25] After Mr Coombs presented his primary evidence, the Decisions Version of the POP was released as the One Plan. This removed the mapped boundaries that had defined the ONL and ONF under the POP (as notified), leaving them to be defined by description. It also provided an updated definition of 'skyline'. Mr Anstey considered the issue of the RPS, which deems the skyline as an ONF, noting the definition in the POP now refers to 'highest points along ridges' rather than just the 'highest ridge'.¹²

¹⁰ Brown, NOE 3009.

¹¹ Wyatt, NOE 1150.

¹² Proposed One Plan – Decisions Version – Schedule F.

[26] In the Board's view, the removal of the map that defined the cadastral extent of the Tararua Forest Park as being the ONL and ONF has also had the effect of diminishing the relevance of much of Mr Coombs' evidence. Additionally, we were of the opinion that much of it was of more relevance as a submission to HRC on its POP. The outcome of the deliberations of the Hearing Commissioners has now been released. We have since been informed relevant aspects of the Decisions Version are under appeal, so we can place little weight on this part of the POP as released.

TAG and FOTR

[27] Ms Lucas was engaged by TAG and FOTR to assess and provide a statement of overview evidence regarding landscape values and the effects of the proposed wind farm. Ms Lucas addressed the geomorphological development of the area before proceeding to consider the Turitea Reserve and wind farm site in terms of landscape values.

[28] When undertaking her assessment of visual effects, Ms Lucas noted that Palmerston North is laid out in a grid pattern, with one set of streets oriented towards the Pahiatua Track–Arawaru length of the Tararua Ranges. She included a number of photos to illustrate this point, with views from Weston, Ruahine, Albert and Rangitikei Streets showing differing sections of the Tararua skyline as seen from the city. These were taken 9 kilometres away and this distance would reduce as one travels towards the Tararua Ranges. She concluded that, for each viewshed, turbines on the main summit ridge would have significant adverse effects and that the aesthetic value of the outstanding natural landscape of the Tararua Ranges to Palmerston North City would be significantly adversely affected by the proposal.

[29] For people recreating in Hardings Park and enjoying views from Red Rock Knob, Ms Lucas considered their experience would also be affected, as would the overall memorability and naturalness of the park experience and be contrary to its recognised scenic purpose.¹³ The turbines would affect the relationship between Hardings Park and the Turitea catchment, as views from Red Rock Knob would be encircled by turbines and the ridgelines disrupted by earthworks,¹⁴ significantly affecting the natural scenic values of the park.¹⁵

[30] Ms Lucas also provided a supplementary statement of evidence which focused on aspects of Mr Brown's evidence and on the statutory framework affecting the proposed wind farm which we further refer to below.

[31] Ms Lucas stated that turbines outside the Tararua Forest Park (such as those in South Range Road and on the boundary with the Forest Park) would affect the landscape values within the park, and similarly turbines that rise up in front of the summit of the Tararua Ranges skyline would affect the ONF and ONL, that is, the skyline. Red Rock Knob is on the skyline, being on the line of

¹³ Lucas, EIC para 147.

¹⁴ Ibid, EIC para 133.

¹⁵ Ibid, para 173.

the watershed between east and west of the Tararua Ranges (as shown in Lucas' supplementary evidence Appendix 2).¹⁶

[32] Mr Bray began his evidence by referring to the cumulative effects that can occur with wind farm development in the Palmerston North area, noting that, with the addition of the proposed Turitea wind farm, the resulting collection of turbines would result in one of the largest wind farms in the world. He expressed concern that the Palmerston North District Plan gave little guidance on wind farm development, despite the fact that it is over 20 years since the first wind farm (*T1*) was consented.

[33] Mr Bray describes the wider landscape as having a wind energy character, but this was not at a very high level. His aim was to find a point where more turbines could be added without that character starting to dominate the ranges on a much greater scale. His conclusion was that wind farms could be extended along the main ridge as far as Marima without this dominance, as this location provides a junction point where the smoother ridgeline to the north meets the sharper ridgeline to the south.¹⁷ If turbines were located south of Marima, they would compromise a noticeably different landscape unit, significantly increasing the perceived footprint of wind turbines in the wider landscape.¹⁸

PNCC

[34] Mr Anstey for PNCC began his assessment by reviewing the work undertaken by Mr Brown in his regional landscape assessment, and generally agreeing with the findings. Mr Anstey noted, however, that while he agreed with Mr Brown that the Turitea landscape may not be outstanding at a regional scale, it may well be outstanding in the more immediate context of Palmerston North City.¹⁹ He also stated his view of the importance community values play in determining landscape values, noting that the associative values of a landscape can only be uncovered through consultation with affected parties.

[35] His overall view was that development of the wind farm would seriously undermine the integrity and coherence of the skyline of the Tararua Ranges and would compromise the natural character and qualities of the Turitea Reserve.²⁰ Despite this, he concluded by expressing his opinion that turbines could be acceptable in the north-east and south-west corners of the site; with the latter being set back from the city, rural residents, intensively managed land and being partially contained by topography. However, after consideration, he felt that these would still be intrusive in views from the plains and would be intrusive for those that go up into the ranges to find respite away from the built environment. He confirmed this during questioning, stating that turbines in the south-west corner would be seen against an outstanding natural landscape backdrop and when

¹⁶ Lucas, EIC, para 27.

¹⁷ Bray, NOE 1985.

¹⁸ Ibid, EIC para 240.

¹⁹ Anstey, EIC para 31.

²⁰ Ibid, EIC, para 12.

viewed from within Hardings Park at Red Rock Knob, the effect of Groups G, F and H would be overwhelmingly adverse.²¹

[36] His final recommendation was that 11 turbines in the north-east corner, on South Range Road, would have no more than minor effects for the residents of Palmerston North.

[37] In terms of the transmission lines and substations, Mr Anstey was of the opinion that these would have inconsequential effects as they can be sensitively located and buildings can be absorbed into the landscape

Outstanding Natural Landscape and Outstanding Natural Feature

[38] We make the point at the outset that ONL and ONF can be identified during the resource consent process as a matter of fact, based on the evidence before us. They do not have to be identified first in the hierarchy of plans as Mr Coombs would wish.²²

[39] Mr Wyatt found that where the Tararua Ranges appear natural, their sensitivity is rated as high. He rated the Tararua Forest Park area south of the South Range Road/Water Catchment Access Road directly abutting the Turitea wind farm site as having high sensitivity and as an ONL.²³

[40] Mr Wyatt also found that, apart from two small sections of tracking, the project does not extend into the Tararua Forest Park, and it therefore does not impact on it.²⁴ The witness noted that the RPS considered the skyline of the Tararua Ranges as being an outstanding natural feature or landscape, and accepted that the ranges are an ONF, but did not accept that there was a defined ridgeline.²⁵ He expressed the view that the area in which the turbines are to be located, while of high amenity, is not an outstanding natural landscape or feature, and the only area that qualifies as an ONL is the forested ranges to the south of Shannon that are visible from the surrounding landscape, and the Turitea Reserve or Hardings Park did not qualify.²⁶

[41] He also found that the scenic qualities of the skyline of the Tararua Ranges will be protected because the turbines will not obscure views of the ranges, nor completely dominate or overwhelm them. Additionally, the wind farm will showcase the ranges and enhance their prominence.²⁷

[42] Mr Wyatt considered the proposal was not contrary to the provisions of the RPS, and went on to find that, because the site was not within an ONL, it was

²¹ Anstey, NOE 3219.

²² *Chance Bay Marine Farms v The Marlborough District Council* (HC) AP210/99, Doogue J and *Unison Networks Limited v Hastings District Council* (HC) CIV 2007-485 896, Potter J.

²³ Wyatt, EIC para 7.26.

²⁴ Ibid, paras 8.2, 8.18

²⁵ Ibid, NOE 1428.

²⁶ Ibid, EIC paras 8.19(b), 8.27–28.

²⁷ Ibid, EIC para 8.20.

not inconsistent with s6(b) RMA. He saw the high amenity area of the ranges as being from Mt Dundas northward, which was well south of the project site. The Turitea Reserve, including areas within the reserve, was included within this area as a high amenity landscape.²⁸

[43] Mr Anstey described the complex topography that makes up some parts of the site, stating that there is no one ridge that is clearly ‘highest’. He then links the ‘outstanding’ status deemed by the RPS on the skyline, with his interpretation of Mr Brown’s position that at least the internal areas of the Turitea Reserve may qualify as outstanding landscape.²⁹ He agrees with this, stating that there are large parts of the Turitea Reserve that do meet the criteria generally used to establish an area as an ONL.³⁰ He goes on to find that most of the Turitea Reserve is at least outstanding at a local or district level.³¹ Mr Anstey in his Introductory Remarks reiterated that both he and Mr Bray regarded large parts of the reserve were outstanding but they agreed that there was a transition area at the northern end where they had reservations.³²

[44] Mr Bray considered the area by dividing it into landscape units, with each one corresponding to a cohesive geographical area. He found that the Hardings Park–Turitea Reserve area of the Tararua Ranges landscape unit had a continuation of the sequence of indigenous vegetation that covers their southern section.³³ He went on to assess the ranges in terms of the *Pigeon Bay* criteria, concluding that the upper ridgelines of the Tararua Ranges could be classified as outstanding, but while the landscape unit containing Hardings Park–Turitea Reserve was close to outstanding in a regional view, it was actually a special amenity landscape.³⁴ Later in his evidence-in-chief he found that the remainder of the landscape, and particularly the skyline, rated as having special amenity significance.³⁵ In caucusing, however, he agreed with Mr Anstey and Ms Lucas that the skyline, which includes a series of ridges, was an outstanding natural feature.³⁶ Additionally, he stated that there are outstanding features in and around the site and the park, and that the skyline ridges have outstanding qualities, but as a whole it is an amenity landscape and not an outstanding one.³⁷ For this reason, he does not believe the whole Turitea site is a s6 matter (our emphasis).

²⁸ Wyatt, NOE 1429.

²⁹ Anstey, EIC para 44.

³⁰ Ibid, EIC, para 119.

³¹ Ibid, para 50, NOE 3216.

³² Ibid, NOE 1501.

³³ Bray, EIC para 53.

³⁴ Ibid, EIC, paras 73 & 228.

³⁵ Ibid, para 228.

³⁶ Caucus statement 12 June 2009. ‘Anstey, Bray Lucas agree that the skyline, which includes a series of ridges, would be described as an ONF. All agree that the naturalness diminishes towards the north. All agree that there are areas within both Hardings Park and Turitea Reserve that have outstanding qualities. Anstey and Bray, whilst accepting that large parts of the Reserve would qualify, there are transitional areas towards the north which have been significantly modified and the pattern of use is pastoral and productive forestry. All agree that the area of the foothills outside the Turitea Reserve is a high amenity landscape.’

³⁷ Bray, NOE 2026.

[45] During questioning, after he had stated that he considered the topographically enclosed Turitea Reserve to be an outstanding natural feature, Mr Bray stated that turbines as seen from points such as Fitzherbert Avenue, and several other parallel streets like it, would have a significant effect on the ridgeline which forms part of this ONF. This opinion was driven by the response of local people and also by the importance of those ranges as a backdrop to the city. He maintained his view that, when considered as a whole, including the wider landscape, the Turitea Reserve is not outstanding but is a special amenity landscape. When considered internally, however, he was of the opinion that it is an ONF.³⁸

[46] Ms Lucas states that her assessment finds that the proposed wind farm site in total is not located within an ONL, but that part of it is and that the proposal overall significantly affects the ONL. She reiterates some key points of her earlier evidence and her interpretation of the RPS being that:

- the Tararua Ranges extend beyond the cadastral extent of the Tararua Forest Park and end at the Manawatu Gorge, while the Tararua ONL extends north to the Pahiatua Track;³⁹
- the extensive dense shrubland native vegetation cover of the Arawaru to Pahiatua Track landscape is highly intact;⁴⁰ with the lands of the Tararua Forest Park ONL being seamless with those of Hardings Park and Turitea Reserve;⁴¹
- the skyline of the Tararua Ranges is an outstanding natural feature or landscape of regional significance;⁴²
- the skyline is the land/sky boundary⁴³ which is the summit of the main range;⁴⁴
- the summit of the main range runs along the eastern ridge of Turitea Reserve, then follows the northern boundary of Hardings Park, before traversing Hardings Park through Red Rock Knob to Arawaru;
- the Tararua Forest Park is an ONF or ONL;⁴⁵
- the various recreational and ecological values of the Tararua Forest Park, Hardings Park and Turitea Reserve continue seamlessly across the boundaries between the three;⁴⁶

³⁸ Bray, NOE paras 2104, 3281–2.

³⁹ Lucas, EIC para 72.

⁴⁰ Ibid, para 27.

⁴¹ Ibid, para 73.

⁴² Ibid, SE para .5

⁴³ RPS definition: The skyline is defined as the boundary between the land and sky at the crest of the highest points along the ridge. The skyline of the Tararua Ranges is the land/sky boundary as viewed at a sufficient distance from the foothills so as to see the contrast between the solid nature of the land at the crest at the highest points along the range and the sky. See Chapter 18.

⁴⁴ Lucas, SE para 15.

⁴⁵ Ibid, para 24.

⁴⁶ Ibid, EIC para 24–25.

- the skyline of the Tararua Ranges and the Tararua Forest Park are recognised as s6(b) RMA landscapes.⁴⁷

[47] Other experts had varying opinions regarding the presence or extent of ONF or ONL or significant amenity landscapes.

[48] Ms Lucas, however, was of the opinion that the ONL classification of the Tararua Forest Park should extend through Hardings Park and Turitea Reserve. Although there are varying definitions of the actual extent of the ONL within her evidence,⁴⁸ we interpret her overall intent to be that the native vegetation areas of the Turitea Reserve are part of the continuum of the Tararua Forest Park ONL. She disagrees with the classifications Mr Brown had assigned to the wind farm site, querying his assessment of the reserve area of the wind farm as an amenity landscape.

[49] Mr Wyatt, on the other hand, consistently saw the Turitea Reserve as not an ONL. Although there are mixed definitions of the actual extent of the ONL within his evidence,⁴⁹ we interpret his overall intent to be that the ONL is confined to the Tararua Forest Park and begins south of Shannon where the high points of the range become visible above the foothills as seen from the western plains.

[50] When considering the issue of the ONL, Ms Lucas noted the continuity of native vegetation cover from south of Arawaru right through the Turitea Reserve, describing it as ‘seamless’ between further Forest Park land to the south, Hardings Park and the Turitea Reserve. She also observed that non-forested areas, such as montane summit lands and wetlands, can have natural values.⁵⁰ She considered that an area need not be highly prominent from beyond to be recognised as an ONL, rejecting any suggestion that rural-residential development outside the Forest Park/Turitea area precludes the area inside from contributing to an ONL.⁵¹ She subsequently agreed with Mr Brown that the northern cadastral boundary of the Tararua Forest Park is not a natural landscape boundary and went on to comment that, in her view, it was appropriate to extend the Tararua Forest Park ONL to include the contiguous protected and natural areas of Hardings Park and Turitea Reserve.⁵² The witness identifies the ONL ranking by reference to Policy 8.1 and 8.3 of the RPS, then goes on to refer to her assessment using the *Pigeon Bay* criteria as also supporting this conclusion.⁵³

⁴⁷ Lucas, para 24.

⁴⁸ Ibid, paras 72–73.

⁴⁹ Wyatt, EIC paras 7.26, 8.27.

⁵⁰ Lucas, EIC para 70.

⁵¹ Ibid, para 71.

⁵² Ibid, para 73.

⁵³ Ibid, EIC para 80. The *Pigeon Bay* criteria of Natural Science Factors, Aesthetic Values, Legibility, Transient Values, Shared and Recognised Values, Tangata Whenua Values, Historical Associations are now included in Schedule F, Table 7.2 of the Proposed One Plan (Decisions Version). Policy 7-7A states that ‘The Regional Council and Territorial Authorities must take into account the criteria in Table 7.2 when, [amongst other things,] (a) identifying outstanding natural features and landscapes’.

[51] Ms Lucas was critical of Mr Brown's assessment that the Area 27 shown in his Annexure 4 was an amenity landscape. It was her considered opinion that this area, which went from south of Arawaru through to the northern end of Turitea Reserve, was more properly classified as an ONL. She supported this view by overlaying Mr Brown's amenity area on a vegetation map from the Landcover Database 2 in her Attachment 12, demonstrating the contiguous indigenous vegetation cover that transposed his amenity and ONL boundaries.

[52] The witness went on to express the view that the elevated lands from Arawaru to Pahiatua Track form part of the Tararua Ranges skyline ONL in terms of Policy 8.3 p and q of the RPS. She also referred to the RPS definition of 'skyline' and notes that Mr Wyatt's photomontages clearly show the location of most of the proposed turbines either directly on this summit or protruding up in front of it into the summit skyspace, ie, within the land-sky junction identified by the RPS as ONL.⁵⁴

[53] Mr Brown's 2008 assessment repeated the process used in his 2006 work, but added one additional viewing point. His conclusions were similar, noting the demarcation between the more modified/developed northern part of the Tararua Ranges and the more natural landscapes. He found that although the Turitea wind farm would not intrude directly into that part of the Tararua Ranges, which he identified as clearly displaying the characteristics of an outstanding landscape, it would come very close to the interface with such landscapes, which he concluded was generally south of Browns Flat.⁵⁵ It would also exert considerable influence over the amenity landscape edges of the Turitea Reserve on both the Palmerton North and Pahiatua sides of the ranges.

[54] The witness drew the distinction between internal areas of the ranges and the surrounding external areas, with the internal area having high habitat and ecological values and the mantle of native forest along the crest of the range – from the Tararua Forest Park to almost the Pahiatua Track – reinforcing the sense of naturalness and integrity associated with the main ridge sequence. He saw the internal forest landscape of the Turitea Reserve and part of the Tararua Forest Park as having a high level of coherence and integrity.⁵⁶ He was of the view that Hardings Park, and possibly the Turitea water catchment, have the feeling of being part of the periphery to the core Tararua Ranges.⁵⁷

[55] Mr Brown expanded on this internal/external distinction when discussing the effects that the surrounding modified land uses have, opining that they substantially erode the significant or even outstanding landscape values and integrity of the Tararua Ranges as a whole, at least until south of Browns Flat, where the Forest Park starts to emerge as a more significant landscape entity in its own right.⁵⁸ When viewed from external locations, such as the Manawatu Plain or the river valley either side of Pahiatua, the landscape is substantially dominated

⁵⁴ Lucas, EIC para 96.

⁵⁵ Brown, *Turitea Wind Farm Assessment of Landscape and Amenity Effects*, June 2008, p59.

⁵⁶ Ibid, EIC para 54.2.

⁵⁷ Ibid, *Turitea Wind Farm Preliminary Assessment of Landscape and Amenity Effects*, January 2006, p39.

⁵⁸ Ibid, *Turitea Wind Farm Assessment of Landscape and Amenity Effects*, June 2008, p66.

by open slopes that are grazed and a scattering of pine woodlots.⁵⁹ Due to the effect of the modified land uses around the periphery of the Turitea Reserve, he concluded that the landscape of and around the proposed wind farm site – *as a whole* – does not qualify as outstanding in terms of s6(b) RMA (our emphasis).⁶⁰

[56] Furthering this point, Mr Brown concluded that there can be little doubt that the Turitea Reserve, the adjoining Hardings Park and the northern reaches of the Tararua Forest Park are highly significant, perhaps even outstanding, when viewed from within.⁶¹ The surrounding land, however, with pastoral, forestry and rural residential development, reduces the landscape to one of significant amenity when viewed from the outside, that is from the Palmerston North and Pahiatua areas. He reinforced this view when questioned by counsel, agreeing that *perhaps* internally the Turitea Reserve could be outstanding,⁶² but in answer to questions from the Board he said the internal Turitea Reserve *is* an outstanding natural feature.⁶³ He also stated that Hardings Park is an ONL, being the start of a very extensive ONL that focuses on the Tararua Forest Park and its mountain, its forested areas, its valleys and so on.⁶⁴

[57] In terms of the applicable planning framework, Mr Brown was of the view that the wind farm would be at variance with the identification of the skyline of the Tararua Ranges as an outstanding landscape in the RPS, and would be at odds with the landscape policies in the Tararua District Plan (TDP) as they relate to the ridgeline of the Tararua Ranges. He reinforced these views in cross-examination, stating that in terms of the RPS it forms part of that area which that document identifies as being an ONL.⁶⁵ These issues are addressed in detail in Chapter 18, Planning Instruments.

[58] In undertaking his assessment for *Turitea*, Mr Brown also referred to the *Pigeon Bay*⁶⁶/*Wakatipu Environmental Society*⁶⁷ landscape assessment criteria, which in his view do not establish clear thresholds of the value necessary for a landscape to be considered outstanding.⁶⁸ This was a clear point of difference with the evidence of Ms Lucas.⁶⁹ Mr Brown observed that the Environment Court had expressed the view that outstanding landscapes should be self evident and the use by the court and landscape architects of terms such as ‘exemplary’, ‘conspicuous’,

⁵⁹ Brown, EIC para 54.2. See also 2008 report, p66.

⁶⁰ Ibid, *Turitea Wind Farm Assessment of Landscape and Amenity Effects*, June 2008, p66.

⁶¹ Ibid, EIC para 72. See also June 2008 report, p66.

⁶² Ibid, NOE 3036.

⁶³ Ibid, NOE 3077.

⁶⁴ Ibid, NOE 3055.

⁶⁵ Ibid, NOE 3077.

⁶⁶ *Pigeon Bay Aquaculture Ltd and Others v Canterbury Regional Council [Environment Court] Decision C52/1999*.

⁶⁷ *Wakatipu Environmental Defence Society Inc and Others v Queenstown-Lakes District Council [Environment Court] Decision No C180/1999*.

⁶⁸ Brown, EIC para 30.

⁶⁹ Ibid, RE para 6.

‘exceptional’ and ‘eminent’, even ‘memorable’, perhaps come closer to identifying such thresholds.⁷⁰

[59] He reiterated his views on its internal outstanding character under questioning, confirming his acceptance that perhaps internally the Turitea Reserve could be outstanding,⁷¹ and that Hardings Park is an ONL,⁷² being the start of an extensive ONL that focuses on the Tararua Forest Park. Yet this is the area that he mapped as an amenity landscape. He had also found that the Turitea wind farm would come very close to the interface with the ONL, which he stated was generally south of Browns Flat,⁷³ but his mapping located this ONL boundary some 8 kilometres south of this.

[60] Mr Brown went on to explain the wider character, where he described the predominance of bare pasture, areas of forestry, rural–residential development and scrub remnants across the external slopes of the Tararua Ranges as substantially eroding its high or outstanding landscape values. This occurs at least until well south of Browns Flat, where the Tararua Forest Park starts to emerge as a more significant landscape entity in its own right. He stated that, because of the contrast between the more natural forest-dominated ‘internal’ qualities of the Turitea Reserve and the more modest periphery, the landscape of and around the proposed wind farm site – as a whole – does not qualify as being outstanding in terms of s6(b) RMA.⁷⁴

[61] Considering these matters separately, Mr Brown is stating that, internally, the Turitea Reserve and the whole of Hardings Park could be considered outstanding when viewed from within, while the external slopes of pasture, plantation, scrub and houses are not. We understand this simple proposition and accept it. Mr Brown then proceeds to combine these two areas to find that – as a whole – the landscape of and around the proposed wind farm site is not outstanding. Again, we understand this simple proposition and accept it. We see, however, no reason for these two separate areas to be considered ‘as a whole’, as this causes the more modified external slopes to diminish the internal values, thus preventing the ‘whole’ of most of the reserve from being outstanding. The amenity nature of the external slopes may have a role to play when considering the visual effects and appropriateness of the proposed wind farm when viewed from the plains to the west and east, as these slopes hide some of the internal outstanding areas, but that is a separate issue to the actual classification of the internal and external areas as ONL, ONF or otherwise.

[62] This internal/external issue appears again with Mr Brown’s opinion that the Tararua Forest Park clearly starts to emerge as an ONL from around the Tokomaru Conservation Area southwards, affording an iconic backdrop to the west coast plains stretching down towards the Kapiti Coast.⁷⁵ North of this point,

⁷⁰ Brown, EIC para 30.

⁷¹ Ibid, NOE 3036.

⁷² Ibid, NOE 3054, 3055.

⁷³ Ibid, *Turitea Wind Farm Assessment of Landscape and Amenity Effects*, June 2008, p59.

⁷⁴ Ibid, p66.

⁷⁵ Ibid, EIC paras 54.3–5.

the pastoral foothills reduce the visibility of the main ridgeline and the high peaks of the central core of the Tararua Ranges. Mr Wyatt supported this by stating that, in his opinion, the only area that qualified as an ONL was that part of the landscape that appears coherent and where ‘forested ranges’ are visible from the surrounding plain.⁷⁶ This starts opposite the township of Shannon and continues southwards towards Upper Hutt.⁷⁷

[63] While visibility of this ONL may be limited, we were not at all convinced that this precludes the ONL from existing until south of Shannon. We have determined that the internal area either is outstanding or is not outstanding with the qualities that make it so, and the location of the viewer is a separate matter. We accept Mr Brown’s apparent agreement in response to questions from the Board that the internal Turitea Reserve is an ONF,⁷⁸ but do not see this reflected in his mapping.

[64] We agree with the statement of Ms Lucas that an area need not be highly prominent from beyond to be recognised as an ONL, rejecting any suggestion that rural–residential development outside the Forest Park/Turitea area precludes the area inside from contributing to an ONL.⁷⁹

[65] At the risk of repeating our summaries elsewhere, this is what Mr Brown variously stated in his earlier reports of assessment of landscape and amenity effects for MRP:

2.2 The Site’s landscape setting

The immediate landscape setting for the TWF [Turitea wind farm] project mostly comprises cut-over, high country, native forest and shrubland. This cover is extensive along the main slopes and valley corridors that face back towards the Manawatu Plain and along the higher hill country of the main range further south, however, it is substantially restricted to lower level, shrub species around the main ridge crests and many of the proposed turbine sites.

Local vegetation is accordingly stratified into a sequence of botanical groupings that reflect the transition from high to lower altitudes:

- alpine tussock grasslands and herb fields near the main ridge crests (mainly south of Turitea)
- subalpine leatherwood shrublands and silver beech forest
- montane miro/kamahi forest
- Rimu/kamahi forest at lower levels
- Tawa dominated forest in the western foothills with some emergent rimu.

This broad spread of vegetative classes is spread across Turitea Reserve’s water catchment and would provide the main ‘land cover’

⁷⁶ Wyatt, EIC para 8.25.

⁷⁷ Ibid, para 8.27.

⁷⁸ Brown, NOE 3077

⁷⁹ Lucas, EIC para 71.

both affected by, and ultimately surrounding, the proposed wind farm and its turbines. Harding's Park, to the immediate south-west of the proposed Turitea wind farm site contains much the same continuum of vegetation, but is also used for recreational purposes, a function excluded from the water catchment.⁸⁰

2.3 Generic Landscape Values

A similar degree of transition is reflected in terms of the landscape values evident within and around the Turitea Wind Farm site, with mountainous, forest landscapes of the central Tararua Range displaying high levels of naturalness, a distinctively New Zealand character (in terms of both landform and vegetation cover), and high values overall.⁸¹

[66] This is contrasted with the modification to the foothills which display significantly reduced levels of appeal. He goes on:

3.4 Direct Effects Findings

Existing Values & Sensitivities

Turitea and, in particular, its main ridges are part of the continuum of subalpine montane land that stretches across the Tararua Forest Park and extends northwards towards the Ruahine Ranges. It is a focal feature in views from Palmerston North, across the Manawatu Plain and from the valleys of the Tararua District. As such, the wider Range is undoubtedly a signature feature in relation to the communities of both areas and the *mantle of native forest along the crest of the Range – from Tararua Forest Park to almost the Pahiatua Track – reinforces the sense of naturalness and integrity associated with its main ridge sequence*. Certainly Hardings Park, and possibly the Turitea water catchment, have the feeling of being part of the periphery to the core Tararua Ranges [our emphasis].⁸²

[67] Further, in that assessment, Mr Brown again describes the landscape of Turitea as undoubtedly having high habitat and broader ecological values.⁸³

[68] In his evidence-in-chief, Mr Brown said this:

... from Turitea Reserve southwards a narrow strip of native forest sitting atop the Tararua Ranges gradually climbs skywards to become more prominent and establish a dark mantle along its crest. *Although sizeable in its physical extent from close to the Pahiatua Track, this core sequence of native forest-covered high country is largely buffered/screened and visually suppressed by pastoral foothills on its western flank until close to Levin – at which point the serrated hills and mountain ridges of the Forest Park attain much more visual*

⁸⁰ Brown, Exhibit 9 Turitea Wind Farm *Preliminary Assessment of Landscape Effects* (2006), section 2.2.

⁸¹ Ibid., section 2.3.

⁸² Ibid, section 3.4.

⁸³ Ibid, section 2.2.

presence in their own right and become a key entity within the broader matrix of visible hill country.⁸⁴

[69] These extracts confirm an indication of Mr Brown's views on aspects of Turitea Reserve's naturalness. When determining an ONL we look to it being underpinned by seamless natural character and this is what we conclude exists from Mr Brown's earlier assessments prior to his EIC.

[70] It also became apparent to the Board that parts of this internal outstanding landscape could be perceived from outside the reserve, such as those visible from Public Viewpoint (VP) 2 along Fitzherbert Avenue.

[71] In response to questioning, Mr Brown confirmed that the view along Fitzherbert Avenue as shown in VP2 symbolised the area he had described as a signature landscape.⁸⁵ He considered that the turbines within these views would have a moderate to moderate/high effect on this natural feature, affecting the ridgeline and skyline, which he accepted as outstanding from a statutory perspective.⁸⁶

[72] During questioning, Mr Bray stated that the internal Turitea Reserve contained outstanding features and agreed that, together, these features made the internal Turitea Reserve outstanding.⁸⁷ He also stated that Back Ridge, as seen in VP2 along Fitzherbert Avenue, would form part of the ONF within the Turitea Reserve and also part of the Tararua Ranges ONF ridgeline classified in the RPS.⁸⁸ He went on to state that there were several viewpoints like that from streets running parallel to Fitzherbert Avenue, and that the effect of the turbines on the ONF within Turitea Reserve as seen in VP2 would be significant and adverse.⁸⁹

[73] The adverse effect on views from Fitzherbert Avenue and such parallel streets was also discussed by Ms Lucas, citing examples in her attachments of views along Weston, Ruahine, Albert and Rangitikei Streets⁹⁰ and in Mr Baker's booklet of photos.⁹¹ Our own site visit confirmed this wider effect, including other streets where the similar effects occur.

[74] Mr Anstey confirmed in questioning that the internal Turitea Reserve and most of Hardings Park was an ONF. He stated that the view down Fitzherbert Avenue as shown in VP2 was viewing an internal part of the Turitea Reserve, the ridgeline of which was part of an ONF, and that the effects of the turbines would

⁸⁴ Brown, EIC para 52.

⁸⁵ Ibid, NOE 3076.

⁸⁶ Ibid, NOE 3076–9, see also *Turitea Wind Farm Preliminary Assessment of Landscape Effects*, June 2008, p66.

⁸⁷ Bray, NOE 2104.

⁸⁸ Ibid, 3281–2.

⁸⁹ Ibid, 3282.

⁹⁰ Lucas, EIC p27, Attachments 18–23.

⁹¹ Examples of such views can be seen in VP2, VP4, VP12 and also a number of RVPs, plus in photographs contained in Document 17, being Mr Baker's PNCC photo booklet from public locations throughout the city.

be significantly adverse.⁹² We note that this is an external view of an internal ONF within Turitea Reserve.

[75] Mr Wyatt remained consistent that these areas were not outstanding, and it was only when further south and the higher parts of the Tararua Ranges rose up above the enclosing farmland that the ranges become outstanding. We note, however, that, in his AEE assessment, Mr Wyatt considers VP2 with the Tararua Ranges terminating the vista at this location, stating that it represents a key pedestrian and vehicular axis, with high viewer numbers located in Palmerston North.⁹³ In his evidence-in-chief, Mr Wyatt assesses the effects of the turbines from this viewpoint also as being more than minor⁹⁴ – short of removing six to eight turbines.⁹⁵

[76] All experts except Mr Wyatt accept Hardings Park to be an ONF or ONL, although Mr Brown and Mr Anstey at times express reservations about some parts of the park's outstanding character. Ms Lucas accepts the Turitea Reserve as part of an ONL, while all other experts except Mr Wyatt accept Turitea Reserve to perhaps be outstanding when viewed from within, with agreed concerns about the diminished quality at the northern end. Ms Lucas, Mr Bray and Mr Anstey accept external views are gained of the ridgeline ONF within the reserve from viewpoints, including VP2, and these are adversely affected by the proposed turbines, while Mr Brown accepts the ridgeline ONF as defined by the RPS as seen from the external VP2 will be moderately affected.

[77] Ms Williams, in her s42A Report, refers to the amended *Pigeon Bay* criteria as an evaluation system that provides a starting point for landscape assessment.⁹⁶ While we share her acknowledgement of its limitations and recognise it is but one of the techniques available to assess landscape significance, we note that this has been applied by a number of witnesses and we generally accept their findings on the facts of this case in this regard.

[78] We are mindful of Mr Brown's concerns over thresholds when using the *Pigeon Bay* criteria, but it is our view that most of the Turitea Reserve clearly meets the threshold required to be outstanding, with these characteristics being self evident and confirmed by evidence, analysis of the relevant planning provisions and our own site visits.

Findings on the ONL and ONF

[79] We find that the northern end of the Tararua Forest Park plus the vast majority of Hardings Park and the internal Turitea Reserve are an ONL. Mr Anstey notes the frayed western edge of Hardings Park and all note the modified character at the northern end of Turitea Reserve as areas that would not qualify as

⁹² Anstey, NOE 3216.

⁹³ Wyatt, Turitea AEE *Assessment of Landscape and Visual Effects*, 8.2.

⁹⁴ That is 'significant', 'high' or 'unacceptable' in his reinterpretation of 'more than minor'. See Chapter 13.

⁹⁵ Wyatt, EIC para 10.18.

⁹⁶ This appears to be carried through to the POP (Decisions Version), Table 7.2 and Policy 7.7A.

outstanding. We accept these minor qualifications. This ONL area is distinct from the pine plantation and cleared land to the north, and the modified external slopes on which the proposed wind farm is also located. These remain a significant amenity landscape as distinct from an ONL.

[80] The common ground of all landscape architects, except one, supported the view to varying degrees that Turitea Reserve is outstanding when viewed from within, while Mr Anstey, Mr Bray and Ms Lucas are of the view that it contains ONFs and/or is part of an ONL. This carries considerable weight with us, with the commonality of opinion and emerging consistency of view reinforcing our own analysis. While it was also common ground to some that there are outstanding natural features, we are of the view that they are part of a whole, which is greater than the sum of the parts, and combine to reinforce the ONL status of the continuum of Tararua Forest Park, Hardings Park and Turitea Reserve. We find that:

- most of the Turitea Reserve is part of an ONL contiguous with Hardings Park and the northern parts of the Tararua Forest Park noting all main findings here relate to the Turitea Reserve;
- the Turitea ONL qualities correspond generally with native vegetation cover, diminishing at the northern end and adjacent edges;
- within Turitea Reserve, there are ONF, including the prominent ridges;
- views of the internal Turitea Reserve ONF can be obtained from outside the reserve from locations throughout Palmerston North.⁹⁷

[81] Having made these findings, we then looked at the appropriateness of turbines as seen in VP2, knowing that their effect on this ONF had been described variously as moderate to moderate/high (Mr Brown), significant (Mr Bray), significantly adverse (Mr Anstey), and more than minor – short of removing six to eight turbines (Mr Wyatt).

[82] As Mr Wyatt states, there are six to eight turbines affected in VP2. We find that due to the scale of these effects (as stated above) on the Back Ridge ONF and internal features of the Turitea Reserve, they should be removed.

[83] However, as Mr Bray and Ms Lucas suggest, when this same ridge is viewed from parallel streets, similar effects occur. This could be seen by reviewing other photomontages, Ms Lucas's attachments⁹⁸ and Mr Baker's booklet of photos.⁹⁹ It became apparent that views from Palmerston North of Back Ridge and the internal slopes that form this ONF within Turitea Reserve decrease to the north as Bryant Hill rises in the foreground to meet Back Ridge at WT11.

⁹⁷ An example is Back Ridge and its western facing internal slopes, which are clearly visible from streets in Palmerston North.

⁹⁸ Lucas, EIC Attachments 18–23 Views along Weston, Ruahine, Albert and Rangitikei Streets.

⁹⁹ Examples of such views can be seen in VP2, VP4, VP12 and also a number of RVPs, plus in photographs contained in Document 17, being Mr Baker's PNCC photo booklet from public locations throughout the city.

Turbines south of this point have similar effects on the Back Ridge ONF as those seen in VP2, and should be removed. Game Ridge rises to screen turbines on Back Ridge at the southern end and itself becomes a prominent ridge which is also an ONF (see Skyline finding below).

Skyline

[84] The status and location of the skyline was a critical issue, both in terms of interpretation of planning provisions and in terms of visibility. The RPS recognises the skyline of the Tararua Ranges as outstanding, as it meets the criteria of Policy 8.1. There was extensive discussion in evidence and during questioning as to the application of relevant RPS provisions.

[85] Using the *Pigeon Bay* criteria, Mr Bray concluded that the skyline of the upper ridgelines of the Tararua and Ruahine Ranges (the Forest Park sections) could be classified as outstanding and agreeing with the POP that the skyline of the whole ranges is particularly significant, especially when viewed from the western side.¹⁰⁰ In questioning, he clarified this to include the back ridgeline of the Turitea Reserve as an ONF,¹⁰¹ just as Mr Anstey also found the main ridgeline, as visible down Fitzherbert Avenue, to be an ONF.¹⁰² Mr Brown saw the ridgeline as being part of the area the RPS identified as an ONL,¹⁰³ and that south of Marima contains the most significant parts of the skyline within the site.¹⁰⁴ Ms Lucas found the main ridgeline to be an ONL, and went on to define the ridgeline quite precisely as being the summit of the main range, the highest crest, running along the eastern ridge of Turitea Reserve, then following the northern boundary of Hardings Park, before traversing Hardings Park through Red Rock Knob to Arawaru. She emphasised that the skyline was more than the centre line of the watershed, it was actually a broad summit. She mapped the summit as a dotted blue line on her Attachment 9. This was based on her interpretation of the RPS explanation, which defines the skyline as being:

The skyline is defined as the boundary between the land and the sky at the crest of the highest point along the ridge. The skyline of the Tararua Ranges is the land/sky boundary as viewed at a sufficient distance from the foothills so as to see the contrast between the solid nature of the land and the crest at the highest points along the range and sky.¹⁰⁵

[86] Mr Wyatt did not agree with Ms Lucas, finding that because the RPS did not map the skyline ridge, it was a movable target and that a defined skyline did not exist. He had considered this in relation to the POP, but still could not see that this helped in defining a skyline ridge.

¹⁰⁰ Bray, EIC para 71.

¹⁰¹ Ibid, NOE 3282.

¹⁰² Anstey, NOE 3218.

¹⁰³ Brown, NOE 3077.

¹⁰⁴ Ibid, NOE 3051.

¹⁰⁵ Manawatu–Wanganui Regional Policy Statement.

[87] Other experts also stated they had difficulty interpreting the skyline plan provisions. In light of these statements by experts, it is relevant to review the applicable RPS definition in terms of landscape.

[88] The explanation above defines the skyline in the RPS. Within this definition, ‘skyline’ is defined using two alternative methods:

- (a) the boundary between the land and sky at the crest of the highest points along the *ridge*, and
- (b) the land/sky boundary as viewed at a sufficient distance from the foothills so as to see the contrast between the solid nature of the land at the crest at the highest points along the *range* and the sky [our emphasis].¹⁰⁶

[89] Ms Lucas mapped on her Attachment 9 the watershed ridgeline of the Tararua Ranges, being the crest at the highest points along the ridge ((a) above). It is apparent that this ridge, however, is screened by higher foreground ridges in some locations, so therefore does not form the skyline.

[90] This situation occurs with Game Ridge, which screens much of Hardings Park Ridge when viewed from Palmerston North. At this point, definition (b) applies, as Game Ridge becomes part of the crest of the highest points along the range. Palmerston North is considered to be sufficient distance from the foothills to make this assessment.

[91] The skyline definition refers to both the watershed *ridge* **and** the highest points along the *range*. In places they coincide. The result for *Turitea* is that where Back Ridge and Game Ridge form the skyline, they are deemed to be an ONF.

Finding on the Skyline

[92] Considering the expert opinion, combined with our conclusion of the skyline being an ONF and Turitea Reserve/Hardings Park being part of an ONL, the Board finds that the skyline ridgeline of the Tararua Ranges, including specifically Back Ridge and Game Ridge of the Turitea Reserve as seen from Palmerston North, has high scenic qualities and natural character provided by its ONF characteristics, its prominence and backdrop vista to the city. These are in contrast to the region’s plains. The proposed wind farm would have a significant adverse effect on the contribution these values make to these outstanding features and landscape, and the natural character would not be protected.

[93] We find that the wind turbines on the southern end of Back Ridge would be an inappropriate development and would not protect this ONF. The affected turbines are WT15–WT29 and WT39–WT43, which should be removed. Turbines WT56–WT66 on Game Ridge also break the skyline and should also be removed.

¹⁰⁶ Manawatu–Wanganui Regional Policy Statement.

[94] Turbines WT127–WT131, WT134–WT136 and WT56 on Love Ridge act as a picket fence, piercing the skyline when seen from public viewpoints within and around Palmerston North. Although not located within the reserve, we have concluded that their presence on a parallel ridge would extend the prominence of turbines across much of the visible internal parts of the Turitea Reserve, negating efforts to protect its skyline, the ONL and the ONF. These turbines should also be removed.

Board Consideration of Comments on Draft Report

[95] The MRP submission on the Draft Report noted Mr Brown’s position being that Turitea Reserve is potentially outstanding when viewed from within, but that he has not agreed that the internal qualities are outstanding when viewed externally. Mr Brown acknowledged the reserve is outstanding from within. It therefore has outstanding natural features which make it outstanding.

[96] In response to submissions on the Draft Report, the Board’s assessment using *the Pigeon Bay* criteria has been reconsidered. Based on information received during the inquiry, we are of the opinion that a compilation in the form set out at para 81 of the Draft Report is simply an analysis of evidence given, which then leads to findings made. In response to MRP’s comments, however, we have removed this paragraph from this Final Report. Where the Board accepts evidence as to the extent of the ONL and ONFs, which relies on those witnesses’ application of the *Pigeon Bay* criteria, we accept those assessments. Other submitters also made comments about the Board’s findings on landscape matters. The Board notes that using the *Pigeon Bay* criteria was but one of a number of methods used to support the evidence that forms the basis of the Board’s findings of fact regarding the Turitea Reserve’s ONL status.

[97] This chapter of the Final Report has been rearranged and rewritten from that set out in the Draft Report to more clearly express the Board’s views on the evidence and its findings. Notwithstanding, none of the findings have changed between the two reports.

Chapter 13: Landscape and Visual Amenity Effects

Introduction

[1] The existing wind farms in the Tararua Ranges already impact on the large population base of Palmerston North. Visual amenity landscapes and the potential effects that *Turitea* may have on viewers' perceptions and lifestyles were thus one of the most significant issues to be discussed during the inquiry. It is complicated because many of the rural residential landowners live in the lower foothills/slopes of *Turitea* and its valleys, some in close proximity to the wind farm, with topography intermittently providing shelter from, or exposure to what would be, multiple layers of wind turbines. It is a significant issue too for the residents of the urban area and the environs of Palmerston North itself, because of the potential visual impact from public places. A project of the scale of the original and/or redesign would encompass a great deal of the main spine of the Tararua Range with a potentially significant proximity 'distance' impact, depending on the viewpoint and the viewer. The Tararua Range has been described as a 'signature feature to Palmerston North'.¹ We questioned whether the wind farm would alter this? Or, would the wind farm, if approved, even in a redesigned form provide an important energy 'signature' to wind farms in the Manawatu.²

[2] Mr Bray, for TAG and FOTR, described the difficulties of covering the potential effects of the various groups of turbines on every property in close proximity to the proposal, or from every location in which the proposal would be seen. These difficulties, engendered by both the terrain and design/redesign layout of the wind farm, and intervening forestry plantations were experienced by many of the experts and they became apparent as the Board attempted to connect the visual impact of the proposal with the affected rural residential areas and its residents.³ The Board's task was not made any easier by the fact that all the landscape experts used differing techniques by which to reach their conclusions. But all the experts generally approved of the photomontages provided by MRP through its expert Mr Wyatt as to the location and number of viewpoints, although there were reservations about the accuracy expressed by Mr Bray⁴ and to a lesser extent by Mr Brown.⁵ These photomontages were to become a central tool in our inquiry (noting here that actual site visits are the only way to capture the reality of landscapes – an issue we discovered to the benefit of the evidence).

[3] Meanwhile, the landowners leasing their pastoral lands to MRP for the development were concerned that the redesign/mitigation of the turbine layout by

¹ Brown, NOE 1465. See also Exhibit 9 *Turitea Wind Farm Preliminary Assessment of Landscape and Amenity Effects*, 2006.

² Ibid, Exhibit 10 *Precis of Preliminary Assessment of Landscape and Amenity Effects*, February 2006, p7. Wyatt, NOE 1150.

³ Bray, EIC paras 111–114.

⁴ Ibid, EIC para 146.

⁵ Brown, NOE 3102.

MRP meant some of the turbines they had previously agreed to locating on their properties were removed. Counsel was engaged to protect their interests while a few personally took part in challenging the landscape evidence, particularly after the redesign. We acknowledge here it has been a difficult time for all landowners involved, particularly where farmers and rural residential residents have had strong neighbourly ties until now.

Submitters

[4] As we have already noted in Chapter 1, there were 702 written submissions on the project and 120 presentations during the first hearing.⁶ The more substantial of these were generally, with one exception, of high quality, carefully thought out and well documented. We were appreciative of the thought and time that went in to their preparation. They helped us understand the project much more comprehensively than we might have because of its scale and the difficult terrain in which it was to be situated.

[5] Almost all submitters excluding the landowners were in opposition to the proposal; however, a small number stated that they believed that the turbines on such a scale were ‘beautiful’ or ‘graceful’ or ‘spectacular’.

[6] The most common theme was that there are already too many turbines on the Manawatu skyline or that the turbines would adversely affect residents’ amenity values. Other submitters highlighted visual effects in another way by saying that the turbines caused clutter or were distracting.

[7] The cumulative visual effect of all of the turbines in the area was another way effects were discussed. Many people noted that the proposed wind farm will ‘fill the only remaining gap’ in the ranges. This was before the *Motorimu* consent was withdrawn and before the *Te Rere Hau* extension was confirmed.

[8] A number of submitters stated that the Tararua Ranges are the only distinctive or beautiful part of the region, which is generally flat and does not have many prominent landforms. Most of the submitters who noted this believed that the ranges should be left in their current state, as the proposal would destroy the beauty of the ranges and its distinctive feature – the Turitea Reserve.

[9] It was also noted that the proposed turbines will be larger than any of those existing in the area. At least one submitter believed that members of the public would not realise the size difference and therefore would not be aware of the likely visual effects even at a distance. A number of submitters noted that the increase in turbine size would mean that they are more dominating for residents living in close proximity to the proposal.

⁶ A further 126 written submissions were made after the redesign of the turbine layout in 2010, although only 31 were heard because those unheard reiterated what they had stated in their original submissions.

[10] The transmission lines proposed were considered by various submitters to have visual effects in addition to the turbines, considering the lines to be ugly and a blot on the landscape.

[11] A large proportion of submitters were concerned about having human-made structures in such an environment. Some referred to the proposal as the ‘industrialisation’ of the rural landscape, as they considered the turbines to be industrial facilities which are inappropriate for the rural and natural character of the area.

[12] A common comment was simply that the turbines are proposed in areas that are ‘just too close to too many residents’. Noise issues and visual amenity effects were a frequent mention in many, many submissions.

[13] The fact that landscaping, including trees, in the MRP report as mitigation for both noise and visual effects was highlighted in a number of submissions. These submitters noted that trees planted for this purpose are not permanent, as some are harvested on a regular basis in this region, and trees are vulnerable to storm damage and fire.

[14] The above rather bland description of the majority of submitters’ concerns does not do justice to their commitment to their environment, their passion about the values of the Turitea Reserve and their affront at the concept of such a very large energy project being injected into their valued locations. This is despite the fact that the land use for wind farms is expressly provided for as a discretionary activity in the rural provisions of the PNCC District Plan and as a result other wind farms are already creating cumulative effects on the landscape. Many of the submitters felt, however, that the area was protected from wind farms because the Turitea Reserve was protected from development, that is, until the High Court, on submission from PNCC, changed the status of the reserve to include renewable energy as a legitimate purpose of the reserve.⁷

Issues

[15] There are a number of issues arising from the landscape/visual amenity evidence of the experts which we wish to identify here as they are germane to the public/private residential viewpoints we wish to concentrate on elsewhere in this chapter. They are as follows:

- the distance factor;
- community relationships with amenity landscapes;
- turbine heights;
- viewers: a numbers game?;
- visual effects assessment;
- tracking, earthworks, substations and transmission lines;

⁷ *Friends of Turitea Reserve Society Incorporated v Palmerston North City Council* (HC) CIV-2006-454-879. Baragwanath J.

- mitigation by planting;
- public perception studies;
- public viewpoint factors;
- residential viewpoint factors.

The Concept of Amenity

[16] Mr Brown, one of the two landscape architects advising MRP, describes the concept of ‘amenity’ as:

... often bound up in the identification and maintenance of values that have even more to do with qualities and dynamics experienced at the local or location specific level, than “landscape”. For instance, whereas the concept of landscape may pertain to a wide ranging mixture of open pasture, remnant bush, hill backdrop and farm buildings that create a certain bucolic imagery and distinctive sense of place, amenity values may relate to the outlook to a single hill, ridge, stand of trees, stream course or other feature that is of little significance to the wider community. Consequently, amenity tends to be bound up much more in locally ‘known’ and appreciated elements and features, and a more subtle array of landscape patterns.

In the rural domain, such values often coalesce to create the very essence of rural character, ie, a balance of natural elements, productive uses (typically expansive as opposed to intensive) and structures, which is underpinned by the enduring dominance of non human-made elements.

Residential amenity is inevitably a core component of the amenity spectrum as it lies at the very heart of most New Zealanders’ quality of life. In addition to being fundamental to the lifestyles that most of us enjoy, it also affects our social status and spills over into our economic well-being simply because houses are most New Zealanders’ single most important investment. In the case of New Zealand’s smaller towns and settlements, but also its farming communities, such amenity often relates to the outlook or views beyond either an urban periphery or the farm yard to key natural features, such as mountain ranges, rivers, lakes and countryside. These are effectively ‘borrowed’ to enhance the experience of living either in such settlements or farmhouses.

The essence of all amenity landscapes, however, regardless of their underlying nature (rural, peri-urban, coastal, montane, etc) and related audiences, is an existing character that is ‘glued together’ by a certain cohesion of expression and unity of elements that gives rise to it being ‘pleasant’, ‘aesthetically cohesive’ and by having cultural or recreational appeal. The essence of maintaining such values is usually the retention of the status quo, or at least the maintenance of the major building blocks that contribute most to a locality’s present-day appearance and imagery.

Consequently, appropriate descriptors of such landscapes may include terms such as ‘distinctive’ and relate to a locality’s ‘sense of place’ and identity. They also retain at least some of the key elements or components – typically landform profiles and/or vegetation.

[17] He then goes on to describe ‘amenity’ landscapes as:

Those where both the characteristics and some physical elements described are prominent and / or typical. Such landscapes must have a sense of aesthetic coherence and physical continuity. Although human modification may be readily apparent in such landscapes, it will either integrate reasonably harmoniously with the natural landscape patterns and structure evident (such as the interplay between pasture and remnant stands of native forest) or will remain a minor overall component of the visible landscape.⁸

[18] Mr Brown, in this careful, thoughtful analysis, provides the background against which we wish to address visual amenity issues in an area which four landscape witnesses in particular describe as having ‘significant amenity’. It is a description of an amenity landscape against which all the elements Mr Brown addresses, that informs both the public and private visual amenity issues arising in this case.

Evidence

MRP

[19] Mr Wyatt, as noted, was consultant to MRP in the joint fields of landscape and visual amenity. He undertook four site visits to carry out the necessary fieldwork, including a flight over the Manawatu, to understand the region’s landscape characteristics. Mr Wyatt began his extensive brief with an assessment of the positive public perception of wind farms here and in Australia, highlighting the level of support for *Turitea* at 60% of those who live within a 15 kilometre radius of the project area (19% opposed, 21% neutral or undecided), which he considers is the most sensitive location for the residents. He identifies such support as unique to wind farms as a subset of large infrastructure projects.⁹ Seeing this as a key factor to bear in mind in evaluating the acceptance by the public of the visual impact of a wind farm in an area considered to possess high landscape values, Mr Wyatt added a rider – ‘they are generally accepted by the majority of viewers in all but the most sensitive locations’.

[20] Mr Wyatt regards the areas of the Tararua Ranges to the north of Mt Dundas as having high amenity value bringing it within s7 RMA. This assessment is based primarily on the ranges’ importance as a skyline feature in the Manawatu region, the ruggedness of the topography and the presence of

⁸ Brown, EIC paras 33–39.

⁹ Wyatt, EIC paras 5.1–5.16. He acknowledges data collected by Research New Zealand March/April 2009. Figure 5.

vegetation. He considers, nevertheless, that the wind farm's visual landscape effects will be acceptable having regard to:

- the small section of the ranges that will be affected;
- the landscape's sensitivity and capacity to absorb change, having already been substantially modified by human activities;
- the distances from which relevant views will be obtained;
- the fact that people remain able to enjoy the landscape once the wind farm is in place, albeit under different circumstances.

[21] And while the greatest impact will undoubtedly be on the residential properties close to the wind turbines, Mr Wyatt identifies landscape planting and treatment can be effective in mitigating potential visual impacts; they will reduce a visual impact from 'more than minor' to 'minor' or even to a 'de minimus impact'.

[22] Further, while there are areas of Palmerston North from which visual effects may be more than minor, because of the (low) viewer numbers involved, Mr Wyatt does not consider there will be lasting concerns because of:

- the type of the landscape involved;
- the community tolerance for wind farms in the region;
- the wind farm's consistency with the objectives and policies of the relevant planning instruments addressing landscapes and visual amenity issues.

[23] Based on contextual analysis of the landscape and visual effects supported by a comprehensive series of photomontages, photographs, maps and drawings, and four distinctive landscape units – 'Cleared Flat Farmland', 'Vegetated Flat Farmland', 'Cleared Ranges' and 'Forested Ranges',¹⁰ Mr Wyatt notes that this rating is supported by reference to the *Pigeon Bay* landscape criteria. He then applies this sensitivity rating to determine visual effects by adding viewing distance and viewer numbers to the criteria, arriving at an overall visual impact from representative public viewpoints. Finally, for a viewpoint to have effects that are 'more than minor', all three relevant criteria (distance, sensitivity and numbers) must be assessed as higher than 'low' (ie, 'medium' or 'high'). On this basis Mr Wyatt considers the wind farm site is eminently suitable for its purpose in both visual amenity and landscape terms.¹¹

[24] Mr Wyatt's supplementary statement regarding the turbine layout design refinement project in 2010 reaffirmed his conclusions in his earlier evidence that the Turitea area of the Tararua Ranges has the capacity to absorb a further wind farm in this location for the reasons already given. In the redesign, 122 turbines from the original layout design were reduced to 104 with modifications to the placement of many other turbines. Even so, he considers there would only be a minor increase in the level of cumulative effects from sequential views as one moves through the Turitea landscape. With *Motorimu*

¹⁰ Wyatt, EIC paras 7.5–7.20.

¹¹ Ibid, EIC paras 16–16.3.

excluded, he provided a cumulative effects assessment with the *Te Rere Hau* extension, and also an assessment of different heights for the project and transmission line effects. His claim of a high level of community acceptance for wind turbines in all but the most sensitive locations was also stressed again as a significant factor in his findings.

[25] For the redesign/mitigation project, Mr Wyatt included 11 revision photomontages with change to a further three to incorporate additional amendments representing the reduction in the number of turbines.¹²

[26] After a meeting with Mr Brown, who had been called in to be the lead consultant landscape architect to MRP on the redesign, it was agreed that the factors they both considered in understanding the visual changes to be made were as follows:

- (a) the need to reduce complexity/overlapping of wind turbines;
- (b) the need to remove some wind turbines from foreground ridges;
- (c) the need to reduce the scale and/or dominance of wind turbines in the landscape (eg, differing placement allows other landscape features to dominate); and
- (d) removal of wind turbines from identifiable landscape features (eg, removal from high points).¹³

[27] Mr Wyatt in his conclusions on the redesign considered:

- that only ‘minor gains’ may be made by the removal of the identified wind turbines, especially those that are closest to individual residences; although he observed the removal of wind turbines around the Bryant Hill and Polson Drive areas has reduced visual impact;
- that the minor alterations to the alignment of individual wind turbines within their turbine zones make ‘minor improvements to’ or ‘slightly reduce’ the level of visual impact; but the project’s visual impact is still to a large degree dependent upon whether the landscape around Palmerston North in the foothills of the Tararua Ranges can accommodate a wind farm;
- that the level of acceptance for wind farms within the Manawatu and the *Turitea* project in particular support his earlier evidence that this is a landscape in which the wind turbines proposed are acceptable; this level of acceptance does not require the removal of rows of turbines to achieve an appropriate outcome;
- that close residential properties will be impacted upon especially if their owners are part of a community (or group) who find the presence of wind turbines unattractive and unacceptable.¹⁴

¹² Wyatt, SS paras 3.1–3.7.

¹³ Ibid, SE para 3.4.

¹⁴ Ibid, SE paras 8.4–8.6.

[28] Mr Brown, in his primary statement of evidence, provided an assessment of *Turitea* in a wider landscape context rather than visiting individual residential viewpoints.

[29] His statement included much of the material contained in his *Assessment Landscape and Amenity Effects* (2008) and a detailed assessment of the Tararua Ranges which had also been in the earlier document. This was a careful description of the area immediately surrounding the Turitea Reserve. But it goes further in its assessment of landscape and amenity issues relating to Part 2 RMA (s6(b) and s7(c)). The conclusions he reached are discussed in Chapter 12 of this report.

[30] Even with his rebuttal evidence at the first part of the hearing there was nothing from Mr Brown in 2009 to assist in our evaluation of the more specific adverse landscape/visual amenity effects of the rural residential dwellers around the *Turitea* site – he noted that this he left to Mr Wyatt.

[31] In the resumed hearing in 2010, Mr Brown provided supplementary evidence and an opening statement on the redesign/mitigation project he undertook for MRP summarising his involvement in the redesign process, outlining his conclusions as to the visual effects of the redesign layout, and addressing aspects of the further evidence of Mr Anstey, Ms Lucas and Mr Bray. He explained that the main purpose of his brief (which we have earlier touched on) was to assess:

- visual prominence/dominance of the turbine zones he considered particularly problematic around Ngahere Park Road, Pahiatua Track and Aokautere Drive;
- impacts on specific landscape features (eg, notable hills and knobs), comparing the Wyatt 2009 photomontage with the 2010 photomontage provided by Mr Wyatt for the redesign;
- intrusion into the foreground or middle distance views as opposed to background;
- the visual overlapping and visual jumbling of turbines as seen by comparing the 2009 and 2010 images;
- cumulative effects of *Te Rere Hau*;
- where the remaining or relocating turbines would result in a significant reduction of landscape visual effects.

[32] After completing this exercise Mr Brown concluded that:

Turitea will still be clearly visible from many locations and it will have significant visual effects, particularly when viewed as a whole from the Manawatu Plain, parts of the Tararua Valley and some nearby residential viewpoints:

- any reduction in turbine height would not significantly change this visual impact;

- in order to achieve any further meaningful reduction in Turitea's effects, MRP would be required to make major modifications to the whole project.

[33] Having removed or relocated what he considered to be the most dominant/prominent turbine zones, Mr Brown considered the revised proposal was still acceptable with the remaining 104 turbines.

[34] The witness identifies his approach was based on his assessment of the factual evidence in the first part of the hearing, including:

- an acceptance relating to the values attached to different parts of the Tararua Ranges;
- in undertaking the redesign, an acceptance 'that there would have to be' a wind farm of some size and scale as originally proposed on *Turitea* (his task was to undertake a redesign rather than a total removal);¹⁵
- the core of this would be the South Range Road ridge and some of the other ridges that would logically provide the focus for the development;
- if the wind farm was overly dominant then the whole project should be removed;
- if not, then the analysis moved to the dominance of particular turbines on the high parts;
- the analysis then continued onto the perceived intrusion into the foreground and middle distance and what was more perceivable from quite close up;
- excessive structural complexity as an issue – multiple turbines visually overlapping one another;
- cumulative effects.

[35] And in this evidence Mr Brown includes three factors he considers may ultimately be just as important in terms of the public perception of the configuration of the turbines. These are turbine design, turbine height and turbine scale relative to landform height – a measurement scale he called 'the golden mean'.¹⁶

Summary of the Position of MRP's Landscape Witnesses in Resumed Hearing in 2010

[36] It is useful here to provide a brief overview summary of where the MRP evidence on landscape/visual amenity evidence after the redesign brought us to at the end of the hearing:

- Mr Wyatt and Mr Brown approve of a wind farm in this location;

¹⁵ Brown, NOE 3070.

¹⁶ Ibid, SS para 8; NOE 3070–3072.

- Mr Wyatt and Mr Brown do not believe the Turitea wind farm site as a whole on the Tararua Ranges is an ONL as viewed from outside the reserve;
- Mr Brown accepts that the wind farm will still have a significant impact on the skyline of the Tararua Ranges;¹⁷
- both Mr Brown and Mr Wyatt are clear the Turitea site and its rural surroundings have very high amenity value;
- both witnesses present a public viewpoints' analysis with Mr Brown giving especial consideration to a landscape analysis;
- only Mr Wyatt specifically addresses effects on the rural residential communities surrounding the Turitea site; Mr Brown says that he made his assessments of the redesign from all of Mr Wyatt's viewpoints, photographs and photomontages, and visits to some locations to confirm his perception of these;¹⁸
- Mr Wyatt relies strongly in both hearings on two factors only to mitigate what he terms in the first part of the hearing as 'more than minor effects' – MRP's public perception survey to indicate that members of the Palmerston North public accept the *Turitea* proposal – and landscape/vegetation planting to screen off affected rural residential or residential properties;
- Mr Brown does not rely on either, his only comment on the emphasis put by MRP's research on public perception studies was he 'is not surprised to find that those who participated in that study were conflicted, caught as they were between the two stools of environmental responsibility and concerns about *Turitea*'s potential for more direct impact on their environment'; and he provided Mr Love, a submitter landowner supporting turbines on his land, with a clear 'no' when he was questioned as to whether he supported mitigation planting to offset the adverse visual impacts of the turbines;¹⁹
- Mr Wyatt relies on low viewer numbers to mitigate effects from roads and public places, but both experts rely on them in respect of the outward views from Hardings Park;²⁰
- Mr Brown concluded that the main ridges of Turitea are part of a continuum that stretches across the Tararua Forest Park which is a focal feature in views from Palmerston North; as such, the wider range is undoubtedly a signature feature in relation to the Manawatu and Tararua communities, and the back ridgeline of the Turitea Reserve, as framed in the view south along Fitzherbert

¹⁷ Brown, NOE 2998.

¹⁸ Ibid, NOE 2999.

¹⁹ Ibid, NOE 3097.

²⁰ Ibid, NOE 2998, Wyatt, EIC paras 10.12c, 10.45, 10.50 and so on.

Avenue, symbolises this signature feature;²¹ Mr Wyatt does not agree with Mr Brown on this issue;

- having both proffered information in the first part of the hearing as to cumulative effects, both Mr Brown and Mr Wyatt consider that the redesign is unlikely to make a substantial difference to these;
- despite the very fact of the need for the redesign demonstrated that there was a problem with the effects of landscape/visual amenity issues at the end of the first hearing, Mr Wyatt maintains the mitigation provides only a minor or subtle (improved) impact;²² Mr Brown considers that, while the changes are quite subtle, they are less so with respect to the views towards and in Bryant Hill most notably from Ngahere Park where there has been a dramatic reduction in the level of intrusion and dominance and to a lesser degree from around Polson Hill Road and the western half of Pahiatua Track; meanwhile subtle improvements have been achieved in the relocations;²³
- as to cumulative effects, Mr Brown considers the proposed relocation of some turbines was not sufficient to achieve greater separation between *Turitea* and *Te Rere Hau*.²⁴

PNCC

[37] Mr Anstey, landscape consultant for PNCC, worked closely with Mr Jeff Baker, council planner for the PNCC, to develop an understanding of the foothills communities around *Turitea*. He also worked with Mr James Baines, the council's consultant on social impact issues, to engage with the community through focus groups to explore their perceptions, aspirations and concerns about the proposal.

[38] In terms of methodology, Mr Anstey visited all the viewing points chosen by Mr Wyatt on the western side of the Tararua Ranges, both public and private and many others. Along with other assessment methods, he undertook extensive site visits to round out his knowledge of the proposal and attempted to identify all rural and rural residential dwellings within 3 kilometres of the proposed turbines. He also grouped the turbines to assist in his assessment of effects – while acknowledging that the impact of individual turbines becomes more important than groups in his final analysis of adverse effects.

[39] Mr Anstey summarises his findings thus:

- the development, as originally proposed, would have serious and adverse effects on the foothills and the ranges that form the backdrop to Palmerston North City;
- the development would seriously undermine the integrity and coherence of the skyline of the Tararua Ranges and would

²¹ Brown, NOE 3076.

²² Wyatt, SS para 4.5 Resumed Hearing.

²³ Brown, SS para 17 Resumed Hearing.

²⁴ Ibid, SS para 20.

compromise the existing natural character and qualities of Turitea Reserve;

- the amenity values of the foothills of the Pahiatua, Turitea and Kahuterawa communities would be similarly compromised – areas currently regarded as central to the identity and quality of life in these communities would be seriously undermined by the presence of the turbines, their scale, numbers and movement;
- for the city and the surrounding plains, the wind turbines would be all pervasive because they are in such large numbers and are large structures;
- turbines would be seen in serried rows running along the skyline on the recurring ridges and spurs that provide orientation north west – their height would enable even the nearest rows to stretch above the skyline;
- there would be significant cumulative effects (this was before *Motorimu* was withdrawn and the *Te Rere Hau* extension granted);
- the legibility of the skyline would be enhanced as people's attention would be drawn to it due to the prominence of the turbines; this would certainly not enhance its quality, instead it would completely alter the experience and character of the skyline, having a major and very significant (adverse) effect.²⁵

[40] Mr Anstey supports Mr Brown's assessment of the landscape of the proposed wind farm site and also his more detailed analysis of the site itself, including around the Pahiatua Track and around Turitea Reserve – Hardings Park and down the foothills on either side of Ngahere Park and Browns Flat, which he stated as follows:²⁶

... it must be acknowledged that the combination of a major landform feature, and extensive native forests, still connotes significant amenity value because of the underlying 'naturalness' (ie non-structural/built character) of the landscapes' main building blocks and related qualities:

- the focal nature of the Tararua Ranges as a major topographic feature, especially when viewed from the wide expanse of the Manawatu Plains, Palmerston North, and other related towns;
- the rural, largely bucolic nature of views and outlooks towards much of the ranges and even from within it;
- the relatively quiescent, tranquil nature of the landscape within and around Turitea Reserve;
- the presence of a broad expanse of native vegetation within the reserve, its connection with Tararua Forest Park and ancillary pockets of native vegetation around both.²⁷

²⁵ Anstey, EIC paras 11–17.

²⁶ Ibid, para 25.

²⁷ Brown, EIC para 56.

[41] Mr Anstey also endorses Mr Brown's assessment that the Turitea landscape is a significant amenity one and has high amenity values, and also that the Turitea Reserve has a high degree of natural character.²⁸ He acknowledges that the skyline is recognised in the planning instruments as an ONF and goes on to agree with Mr Brown's view that the internal areas of the site may qualify as an outstanding landscape.²⁹ As noted in the previous chapter, he confirmed this view during questioning that the Turitea Reserve internally was an ONF, as was Back Ridge as seen in VP2 down Fitzherbert Avenue.³⁰

[42] Mr Anstey considers that if *Turitea* were to be developed as proposed in the original design, it would have serious and adverse effects on the foothills and ranges that form the backdrop to Palmerston North City. The turbines are of such a scale and in such large numbers that they would compromise the existing natural character of the ranges and qualities of the reserve. And from the city, the plains and the foothills, the ridgeline turbines would be all-pervasive creating major visual effects. He was also in absolutely no doubt whatsoever that there would be significant cumulative effects.³¹

[43] Mr Anstey concluded after a detailed assessment of the varying levels of effects of the wind farm turbines on public and private viewpoints, that all but 11 of the turbines proposed would result in adverse visual amenity effects more than minor both for the foothills and their communities and Tararua landscapes – those wind turbines being contained within Group E WT99–WT109.

TAG and FOTR

[44] Mr Bray analysed his visual amenity viewpoints from major and minor landscape units as identified in a recent Opus Consultants Report (Stage I). This report identifies 19 landscape units overall within the district, including a description of landscape character, visual amenity and sensitivity for each one.³² Like Mr Anstey, he too grouped the turbines, and at the end they elected to share the same groupings.

[45] Mr Bray's focus was on the visual amenity effects of the wind turbines only. He did not make an assessment of the roading or network utility requirements, although he did consider cumulative effects as did Messrs Wyatt, Brown and Anstey. Basing his assessment of the project through the major and minor landscape units based on early work undertaken by Opus from an amenity point of view, Mr Bray considers Marima as providing a more visible and understood southern boundary for turbine development than the Turitea Reserve boundary. In his opinion, turbines south of that hill on the back ridge of the Tararua Ranges would begin to compromise the integrity of a significantly different landscape unit, with dramatic differences in the visible elevation

²⁸ Anstey, EIC para 50.

²⁹ Ibid, para 44.

³⁰ Ibid, NOE 3217–8.

³¹ Ibid, NOE 3179.

³² Bray, EIC para 28. *Palmerston North Landscape Study*, November 2008, Opus International Consultants PNCC.

between the groups of turbines. Additionally, turbines south of this point would have diminishing effects on aesthetic, recreational and ecological values, especially for users of Hardings Park.³³ Like Mr Anstey, Mr Bray concludes that turbine development should be restricted to the main ridgeline which balances where the existing pattern of wind farm development is located.

[46] Of significance for the inquiry in the discussion of visual amenity effects is his statement that:

... I consider that the foothills south of the Pahiatua Track have an important significance in the wider landscape, appearing almost separate from the main ridgeline. Turbines on these lower landscape units, assuming that turbines were consented on the main ridgeline, would be a 'doubling up' of the apparent density of the windfarm, the effect being a greater saturation of windfarm development in this part of the landscape. Were turbines not consented on the main ridgeline, the pattern of development on the foothills would be in stark contrast to the existing pattern of turbine placement elsewhere. ... the significantly lower elevation of these foothills into upper terraces of the Plains means that turbines would appear almost more dominant over the landscape (particularly if tall machines were installed) than turbines located further back.³⁴

[47] Like Mr Anstey, Mr Bray made extensive site visits to both the eastern and western sides of the ranges, having driven every road within 5 kilometres of the proposal and making stops at over 100 properties within 5 kilometres of the proposal and another 25 properties within 2 kilometres of the proposal to make an assessment from outdoor living spaces around the houses. He also drove to distant points 15 kilometres away. He did not undertake an assessment of visual amenity effects from locations beyond houses and immediate gardens of properties. His evidence therefore focuses on the visual amenity effects for residents he deems the most significant.

[48] Nevertheless, from public viewpoints, although they were not his main focus, Mr Bray considers the turbines on the ranges along South Range Road would be dominant, with recurring elements from streets in Palmerston North many of which are oriented directly to the wind farm site.³⁵

[49] Using a scenic aesthetic assessment model, by which to analyse this landscape in terms of appropriateness for further wind farm development, Mr Bray considers that wind turbine zones Groups D and E, WT1–27, WT38–41, WT43, WT99–109 would fit within his declared sphere of acceptance for the proposal. But, under questioning, he stated that 'he would be very comfortable with stopping at WT8 or perhaps WT10, around that area'.³⁶ He defines the models as:

³³ Bray, para 88.

³⁴ Ibid, EIC para 91.

³⁵ Ibid, EIC para 191.

³⁶ Ibid, NOE 3279–80.

The ‘ecological aesthetic’ model is based upon a notion that the more pristine an area is ecologically, the greater its perceived aesthetic value will be. This is then developed into the cultural notion that if it is ecologically good, it is therefore beautiful.

The ‘scenic aesthetic’ model, on the other hand, is based on the premise of what an ideal landscape should look and function like, and culturally derived expectations. This model draws on the concepts of the ideal landscape being a construct of nature with human intervention. It is derived from the theories of the picturesque put forward within the formal arts.³⁷

Discussion of Issues Arising

The Distance Factor

[50] Mr Wyatt identifies that the varying zones of visual impact in assessing landscape issues (‘the distance factor’) have long been a contentious issue.³⁸ When undertaking his assessment of visual effects, he employed a method that defined what he called the ‘viewshed’ and the zones of visual influence. The viewshed was not the same as the extent of visibility, but was the area from which turbines could create a measurable impact within a human modified landscape. This was determined with reference to the parameters of human vision, and was established by determining the extent to which an object is part of an observer’s static field of view. As his technical reference, Mr Wyatt based his method on the work of Julius Panero and Martin Zelnik from their book *Human Dimension and Interior Space*.³⁹ He considered that the overall height of the wind turbine (as opposed to width of the wind farm) was the relevant factor in determining the extent of the viewshed, and this needed to be based on an analysis of the extent to which wind turbines extend into the vertical field of view. He stated that a person’s natural or normal line of sight is usually a 10° cone of view below the horizontal, and if sitting it is 15° (our emphasis).⁴⁰

[51] We have added the emphasis to the word ‘cone’ as the reference that Mr Wyatt uses does not refer to a ‘cone’ but simply refers to a line, stating that ‘if standing, the normal line of sight is about 10° below the horizontal’.

[52] The Board was also directed to a number of other such tables by other landscape witnesses, namely:

- visibility tables used by Boffa Miskell for *Tararua 3*, which identified the ranking as – 0–1 kilometres (Immediate) effect,

³⁷ Bray, EIC para 32.

³⁸ Wyatt, EIC paras 1.4–1.6. Mr Wyatt gave a list of wind farm projects he has been involved in as a result. We note, however, that the wind farms he lists do not give the number of turbines built, their topography or their proximity to viewer audiences.

³⁹ Panero J and Zelnik M, *Human Dimensions and Interior Space*, 1979. Whitney Library of Design, Section 9.1, p286.

⁴⁰ Wyatt, EIC para 6.7.

- 1–3 kilometres (Local), 3–6 kilometres (Middle Distance), 6–10 kilometres (Distant) and 10–25 kilometres (Very Distant);
- the Sinclair–Thomas matrix mentioned by Mr Bray and identified also by Mr Anstey⁴¹ is a Scottish study applied to so-called ‘second generation’ wind turbines; but it does not address the scale of structures envisaged by *Turitea*, nor could it be used to address the variability in terrain, atmosphere and weather conditions in the Manawatu;
- Mr Brown’s Appendix C, which included criteria for the identification of outstanding and amenity landscapes,⁴² such identification consisting of landscape character, geophysical structure and value thresholds made up of pristine, less than pristine and modified landscapes.

[53] Mr Wyatt states the ranges of visual impact he uses are more conservative than Boffa Miskell’s, while concluding that the turbine height difference between the two is of no great consequence to his analysis (although he indicates the Boffa Miskell table is one he would use for turbines of lesser height than those proposed for *Turitea*).

[54] Mr Anstey appears to support both the LS&VA tables and those of Boffa Miskell, with which he is familiar, while Mr Bray places some emphasis on more recent case law in the Environment Court which indicated for those living within 2 kilometres there was ‘a real potential for the turbines to be a visually dominant feature’.⁴³ We observe here that Mr Brown also mentions ‘the golden mean’ as a measurement method assessing turbine scale to landform height which we have already referred to.⁴⁴ Whether the three measurements had any correlation was not addressed.

[55] Mr Wyatt and Mr Anstey appear to be in some agreement that ‘turbines 125 metres high have the potential to dominate the landscape out to 3 kilometres at least’.⁴⁵ They also appear to agree that there is the potential for the *Turitea* turbines to be ‘prominent’ out to 8 kilometres,⁴⁶ with Mr Wyatt disagreeing that they could ‘dominate’ at this distance for the reasons given in the LS&VA (low viewer numbers, the importance of public perception studies and his opinions on the parameters of human vision).

⁴¹ Parliamentary Commissioner for the Environment 2006: *Wind Power, People and Place*, p54.

⁴² Brown, EIC paras 32–39, Appendix C p47.

⁴³ Bray, EIC paras 119–120, citing *Motorimu Wind Farm Limited v Palmerston North City Council* [Environment Court] Decision No W 067/2008.

⁴⁴ Brown, NOE 3070–3072.

⁴⁵ Wyatt, RE para 3.5; Anstey, EIC para 53.

⁴⁶ Bray, EIC paras 117–118, citing the matrix prepared by Boffa Miskell Ltd.

[56] Mr Brown in his analysis goes further than Messrs Wyatt and Anstey as to prominence in his assessment for MRP in 2006, where he states:

... the wind farm would remain visually prominent on the Manawatu Plain until beyond Palmerston North – at more than 12 kms from Turitea.

[This certainly raises questions about the ‘Zones of Visual Influence’ employed in other studies and the potential for the visibility of wind farms to be misconstrued because of the differences in contrast between the human eye, computer monitors and printed material cited at page 19 and in Appendix C].⁴⁷

[57] We were to experience the prominence of wind farms at a distance for ourselves as we sat during the hearings in the Palmerston North’s FMG Stadium and could see on clear windy days the frenetic activity of the small two-bladed turbines of *Te Rere Hau* to the left of our viewshaft; and in the far-left distance the larger blades of *Tararua 3* turning more languidly in the wind at a distance of approximately 10 kilometres, and further on again, *Te Apiti* presenting similarly.

[58] Mr Bray had a different approach again and appears to concur with Mr Wyatt’s opinion where he found that the turbines north of WT27 in Group D and all of Group E to have ‘less than minor effects on amenity’ because ‘distance is the main mitigating factor as from most locations east and west of the Ranges’.⁴⁸ He conceded that there is no magical line at 2 kilometres from which to provide a turbine ‘setback’ for amenity reasons (which he had appeared to endorse in the first part of the hearing).⁴⁹ He stated his approach around the Group C turbines on Pahiatua Track, for example, was to focus on the residential properties concerned and really understand the effects on them before suggesting they should be removed.

[59] Mr Bray in fact, in his evidence-in-chief, challenges any fixed matrix of visual impacts in relation to viewing distance (such as the one prepared by Boffa Miskell for *Te Apiti*), considering that such a method should be used as a guideline only, and that zones are not definitive. This is because the viewing distance ‘should be considered as a continuum rather than zoned ie, there is no magic line that differentiates effects at 900 metres from those at 1100 metres and it would be inappropriate to attempt to implement one’.⁵⁰

[60] We came to a similar conclusion as Mr Bray at this hearing – as much for Messrs Bray and Brown’s statements on this issue, as well as for what Ms Lucas had to say. In discussing the visual effects matrixes identified by Ms Williams in her s42A Report to the Board on landscape issues, Ms Lucas also finds such devices are ‘a coarse tool’ and just one ingredient in landscape assessment. ‘They

⁴⁷ Brown, Exhibit 9 *Preliminary Assessment of Landscape and Amenity Effects*, 2006, pp40–41. Appendix C is a summary from 2003 Scottish Material Heritage Workshop in 2003 – *Showing Good Practice: Visual Analysis of Wind farms*.

⁴⁸ Wyatt, RE para 3.47, citing Bray, EIC para 188.

⁴⁹ Bray, NOE 3257, 3260–3261.

⁵⁰ Ibid, EIC para 118, SS para 12 Resumed Hearing.

do not recognise landscape context, association and meaning. People's relationship with that land and landscape ... they are a rather crude measure of relative visual prominence'.⁵¹ Citing the Boffa Miskell study chart, Ms Lucas suggests that, at a distance of 10 kilometres, 'stating that turbines are not prominent' and 'that visual effects are "only slight" may be the case in some locations – but quite inadequate in others'.⁵²

[61] We consider that Messrs Brown and Bray and Ms Lucas made a strong case to be cautious of zones of visual influence, for each case will differ. As Ms Lucas maintains, again citing Ms Williams:

The attitude of the viewer to the proposed activity is one aspect. The other is the attitude of the viewer to that landscape. Both are valid considerations. It is not merely about someone liking or not liking turbines, but about how someone relates to the landscape in which they are proposed to be located.⁵³

Finding on Distance

[62] The Board was in no doubt that turbines 125 metres high in a clear view at a distance of 1.5 kilometres would be dominant, and that this distance could easily be greater depending on circumstances. Additionally, turbines clearly visible at a distance of 1.5–3.5 kilometres could be better described as 'prominent and potentially dominant' rather than 'visually evident and potentially dominant', as suggested by Mr Wyatt.

[63] When analysing Mr Wyatt's evidence, it was apparent that while he held the opinion that his spatial range of potential effects had been pragmatically and sensibly modelled, there were a number of inconsistencies between the method outlined in his evidence and the conclusions in the reference document. The key ones were:

- the variance between Mr Wyatt's definition of the binocular field as being 50°–60° and that contained in his reference as being about 60° 'in each direction' ie, 120°;
- the introduction of the notion of a 10° 'cone of view' when the reference does not refer to a cone but refers to the fact that, if standing, the normal line of sight is about 10° below the horizontal.

[64] While the dominance/prominence zones arrived at by Mr Wyatt coincided reasonably closely with those in more subjective reference tables, there were discrepancies in his technical justification for these.

[65] The overriding conclusion was that distance alone is not a satisfactory means of determining effects, due to all the reasons outlined above, such as screening and so on, but it is the factor that makes the greatest contribution to effects.

⁵¹ Lucas, SE paras 45–49.

⁵² Ibid, para 45.

⁵³ Ibid, SE para 49; also Williams, s42A Report 2009, *Summary*, p16.

Community Relationships with Landscapes

[66] The relationship of many of the submitters to the landscapes which surrounded them, and who opposed the proposal, was a major factor in their presentations. Counsel for MRP submitted, however, that submitter submissions and representations do not constitute evidence to the Board and cannot be relied upon in reaching any factual conclusion.⁵⁴

[67] This submission does not appear to take into account s41 RMA and the reference to the Commissions of Inquiry Act 1909, s4B, which provides:

The Commission may receive as evidence any statement document or information etc that may assist it to deal effectively with the subject of the inquiry, whether or not it would be admissible in a Court of law.⁵⁵

[68] Mr Wyatt, in his *Summary assessment of residential viewpoints*,⁵⁶ identifies many residential properties where there was a ‘significant level of impact’ – one which is ‘high or unacceptable’ if the impact could not be mitigated. Mr Wyatt’s sole solution for mitigation of such impacts was vegetation planting, which is not endorsed by MRP’s other landscape witness, Mr Brown, and was one which several divisions of the Environment Court consider do not necessarily assist in the New Zealand context of wind farms on wind swept ranges, in full view from dwellings on nearby footslopes and plains.⁵⁷

[69] MRP did not appear to undertake extensive consultation with the residents before the turbine layout was finalised.⁵⁸ And the ‘call-in’ process has meant they have not had a forum, such as a council hearing, in which to be heard earlier. Where such submitters have indicated to the Board they had difficulties with what is proposed, that resulted in a site visit from the Board – in fact several site visits to some areas – to identify whether what has been said is correct both before and after the redesign. And of course there was evidence – sound evidence – informed not only by submitters and our site visits, but by the experts themselves. Mr Brown was concerned that the question often missing from landscape assessments is that of the ‘community’.⁵⁹ It is to the credit of the foothills communities of the Manawatu proximate to *Turitea* that they provided a very clear representation as ‘community’ to the values they attributed to the surrounding landscapes and amenities of the area.⁶⁰

[70] We also heard details from the landowners, Mr Poff, Mr Waters and Mr Love and Dr Alley, which gave us considerable insight into why they supported turbines on their lands. Mr Poff and the other landowners provided a more

⁵⁴ MRP, Closing Submissions, NOE 4116.

⁵⁵ See s41(1) RMA which incorporates by way of reference this legislation: see Appendix 1 and referred to in Chapter 1 of this report.

⁵⁶ Wyatt, EIC Table 32, para 11.230.

⁵⁷ See the *Motorimu* and *Project West Wind* decisions.

⁵⁸ MRP Memorandum of Counsel, November 2009, para 2.53. This was a response to submitters.

⁵⁹ Brown, EIC para 24, NOE 3097.

⁶⁰ Anstey EIC, para 30.

rounded picture of rural development and subdivision in this rural landscape of the Manawatu.

[71] And in the context of landscape ecology, we also note that Mr Brown observes that Dr Rapson, also a submitter, indicates that some of the shrubland close to South Range Road had made a lot of progress in quite a few decades (although he did not think that was the issue).⁶¹

Finding on Admissibility of Submitter Submissions

[72] We find as a matter of law, submitter submissions and presentations are admissible as evidence to this Board of Inquiry. What weight accorded to them is a matter of judgement for the Board with the caveat that such information should assist only in dealing with the subject of the inquiry.

Turbine Heights

[73] Meridian Energy, the developer of *Project West Wind*, lowered the turbine heights for those originally planned for which allowed the turbines to be more visually acceptable in some locations. Mr Bray would like to keep the heights of any further wind turbines on the skyline ridge south of the Pahiatua Track at 110 metres in order to closely resemble the design of the *Te Apiti* and the *Tararua 3* turbines creating a greater aesthetic coherence.⁶² Mr Wyatt rejects this approach as he considers they create a ‘picket fence’ density, with their height and movement less pleasing to the eye. Also they are located much closer together. He points out that the newer larger turbines are spaced at much greater distances, also spin more slowly and are less frenetic. He says this is apparent both close to the turbines and from vantage points out to 3.5 kilometres.⁶³

[74] In caucus Messrs Wyatt, Bray and Anstey found the methodology (bands) for assessing turbine heights helpful, but Ms Lucas did not because of ‘the variation in the *Turitea* topography in the landscape context’.

[75] Mr Brown addresses turbine height in his evidence on the redesign. He considers it is very difficult to address in isolation unless it is directly referenced against other objects of known height/scale in the vicinity or the interaction with their immediate surrounds. ‘There may be little point in changing the height of *Turitea*’s turbines unless this is directly correlated with markedly increased (or reduced levels of) exposure, visual prominence/dominance and/or intrusion’.⁶⁴

⁶¹ Brown, NOE 1483.

⁶² Bray, EIC paras 95–97.

⁶³ Wyatt, RE paras 3.51–3.56.

⁶⁴ Brown, SE para 8, third bullet point.

[76] Ms Lucas states that she has ‘yet to see any changes in the proposed design or height that would lessen the significant effects’ she had previously identified.⁶⁵

[77] We did not come to any conclusion on the issue of how high the *Turitea* turbines should be as MRP has two options and we do not have a preference for either. But we were cognisant of the fact that:

- the design of the *Te Rere Hau* turbines has already compromised any ‘aesthetic coherence’ with other turbines;
- there is the simplicity of the larger turbines;
- our findings on avian issues support the 200-metre spacings required for these particular turbines as they would be less detrimental for the larger birds like falcons.

Finding on Turbine Heights

[78] We concluded the proposed taller turbines should remain an option because of the additional wind/energy resource they would capture as long as they were far enough away from dominating residential locations. Additionally, while leaving both options open to MRP, we are of the view that the additional 15-metre height of the 125-metre turbines is acceptable in this location, as opposed to the need to reduce them to 110 metres to match *Tararua 3* and *Te Apiti*. The greater spacing of the 125-metre turbines gives them an added simplicity, while the additional 15-metre height is not so great as to cause an imbalance when viewed in the context of 25 kilometres of ridgeline. The scale of the ranges is so great that turbines of this height can be accommodated without the need to reduce their height for visual reasons.

Viewers: A Numbers Game?

[79] Throughout Mr Wyatt’s evidence he cites low viewer numbers either from motor cars or publicly accessible viewpoints for supporting his opinion that, from some viewpoints, visual impacts will be minor, particularly for those who like turbines.⁶⁶ This arises out of one of the criteria he cites as acceptable in the context of his LS&VA table. He considers as an example that the *Turitea* turbines will create a minor adverse effect for the public users of Ngahere Park Road because there are fewer motorists in this location – and in respect of other public viewpoint photomontages, such as those relating to Hardings Park.⁶⁷

[80] Mr Anstey, in response to Mr Wyatt’s opinion, cites greater viewer numbers again which he had researched on the local roads from all sorts of activities (not just cars but cyclists, riders, walkers).

⁶⁵ Lucas, *Turitea Wind Farm Revision – Landscape Review* para 9.

⁶⁶ Wyatt, RE paras 4.7–4.12.

⁶⁷ *Ibid*, RE para 4.5, citing his LS and VA Section 8.5, p69.

[81] We consider that stating ‘the visual impacts of turbines will be minor because there are few people to see them’ is not useful in the s5(2)(a) RMA context, for we are assessing the impacts of the *Turitea* proposal in the context of meeting the ‘reasonable foreseeable needs of future generations’ – as well as the present.

Finding on Viewer Numbers

[82] We do not consider the number of viewers to be determinant of the visual effects of the proposed turbines.

Visual Effects Assessments

[83] Mr Wyatt undertook a ‘seen area analysis’. This is a computer-based analysis that identifies the areas within the viewshed from which any part of the wind farm may be visible. He notes one of the salient points from that analysis being that there are limited views of the development from (and therefore impacts on) the Tararua Forest Park.⁶⁸ This analysis was followed by an assessment of effects from 14 publicly accessible viewpoints. In this assessment, he considered the distance of the viewer from the site, the sensitivity of the surrounding landscape and the number of viewers. He used a four-point scale to rank effects, from ‘de minimus’ to ‘minor’ to ‘more than minor’ to ‘high’.

[84] He stated that distance is normally the factor that results in a ‘de minimus’ effect. Viewpoints are given a ‘minor’ rating if any one (or more) of the three assessment criteria (distance, sensitivity and viewer numbers) are assessed as low. Viewpoints get a ‘more than minor’ rating if all three assessment criteria are higher than low. A ‘high’ rating is given where an extensive adverse effect cannot be mitigated.

[85] As we note below, following his assessment of public viewpoints, he found that four would have more than minor visual impacts.

Finding on Visual Effects Assessments

[86] We had some difficulties with Mr Wyatt’s view analysis. We note that the *Pigeon Bay* criteria indicate significance and not sensitivity, while viewer numbers are not considered a determinative matter in assessment. Additionally, the need for all three criteria to score higher than ‘low’ for a viewpoint to have ‘more than minor’ effects appeared arbitrary and unduly prescriptive, not allowing for individual circumstances where one ‘low’ scoring factor may drag down the other higher scoring factors and prevent a ‘minor adverse effect’. Finally, the Board pondered the use of this method when, in all four cases that resulted in ‘more than minor’ effects, justification for no action was being based on:

- the community acceptance survey;

⁶⁸ Wyatt, EIC para 9.6.

- the limited extent of expansive views of the ranges from Palmerston North;
- the Massey University carpark as a selected viewpoint;
- the landscape not being of such sensitivity to require mitigation.

[87] If none of the public viewpoints resulted in any need for mitigation, we were left wondering why turbines were removed or relocated as part of the redesign. From Mr Brown's evidence, turbine removal did not appear to be solely due to effects from private properties.

Turbine Grouping

[88] Mr Bray and Mr Anstey grouped the turbines from the layout produced by MRP, and the experts' caucus (with the exception of Mr Wyatt) agreed this was helpful. But they also agreed that in the final analysis individual turbines can become critical in assessing effects.

[89] For PNCC, Map 2 from Mr Baker's EIC (Appendix 2) illustrates the turbine groups as indicated by Mr Bray. While they did not strictly relate to community groups, they were a useful tool for referencing different areas of the wind farm during discussion and provided a map of where the community groups are located. The turbine grouping is shown on the maps attached to this report Appendix 6, 7 and 8.

[90] In any event, the reference to 'Groups' became something of a non-issue for all experts at the end of the day, for senior counsel for MRP was using the term 'Groups' in cross-examination and as a way of identifying areas in his closing submission.⁶⁹

Finding on Turbine Grouping

[91] Grouping is a useful tool, providing assistance when referencing turbines within the wind farm. The grouping did not detract from assessing effects of individual turbines, as is evidenced by the fact that retention or deletion of turbines has not followed the group boundaries.

'Minor Effect' – or 'Significant', 'High', or 'Most Overly Dominant', 'Most Dominant', 'Dominant' or 'Prominent'

[92] Mr Wyatt appears to resile from the term 'more than minor effect' as the acceptable threshold for visual amenity impacts in his rebuttal evidence, because whilst 'minor effect' has become currency as a threshold for assessing effects under the RMA, it is in fact only a genuine threshold in relation to non-complying activities under s104D.⁷⁰ In his evidence-in-chief Table 32 *Summary Assessment*

⁶⁹ Davidson, MRP Closing Submission.

⁷⁰ Wyatt, RE paras 4.22–4.27.

of residential viewpoints, Mr Wyatt concludes threshold measurement as ‘more than minor’ – but he also states that he recognises ‘a more than minor’ level of impact is still ‘a significant one’ – which would be ‘high’ or ‘unacceptable’ – if the impact could not be mitigated.⁷¹ (Mr Wyatt adds the rider that he had not identified any residential viewpoints from which he considered a high level of visual impact of the Turitea wind farm would be unacceptable (ie, because it will be possible to mitigate with landscaping/vegetation planting)).

[93] We note Mr Brown uses a number of terms – ‘most overly dominant’, ‘overly intrusive’ ‘most dominant’ and ‘prominent’, while Mr Pollock under planning issues used the term ‘most dominant’.⁷² Messrs Anstey and Bray appear to use ‘dominant’ or ‘prominent’, not ‘most overly dominant’ or ‘overly intrusive’.

Finding on ‘More than Minor’ Effect

[94] Because of the attention Mr Wyatt rightly drew to the issues around s104D, we intend to address below ‘more than minor effects’ as ‘dominant’, ‘significant’, ‘high’ or ‘unacceptable’ on Mr Wyatt’s recommendation, while ‘dominant’ appears to be the common denominator from all witnesses around assessment of effects.

Support Infrastructure (Tracking, Earthworks, Substations and Transmission Lines)

[95] Mr Anstey contends that roads through the Turitea Reserve would significantly impact on its existing natural character creating a built industrial character.⁷³ Mr Wyatt observes that Mr Anstey provides no supporting analysis for this assertion. Mr Wyatt considers that the turbine pads and roading earthworks will be primarily in-cut and this solution means they will remain largely hidden from view and therefore minimise any visual effects.⁷⁴ He also considers the lattice towers of the transmission lines will be a minor component of the view given the distances to the nearest viewpoint from all but a few specific adjoining areas. Also the monopole towers (to be used for the 220kV line from the top of the ridge near Browns Flat to the existing Linton substation) are far less conspicuous in the landscape than the lattice towers used on wind farms elsewhere, appearing as they do as typical roadside power lines.

[96] Mr Wyatt concludes nevertheless that a section of the transmission lines outside of the reserve will have a significant adverse effect when visible from some nearby residences. But should there be a need for screening, both the towers and the associated substations can be addressed by way of vegetation planting either in front of or behind the transmission lines, smaller foreground planting

⁷¹ Wyatt, EIC paras 11.230–11.239.

⁷² Brown, SE para 24; see also NOE 3046. Pollock, NOE 3781.

⁷³ Anstey, EIC para 116.

⁷⁴ Wyatt, EIC para 13.1.

near a residential viewer, or by utilising deciduous trees in the foreground of a residential view.⁷⁵

[97] We accept that the visual amenity effects of transmission towers and lines in the context of residential viewpoints will have a significant adverse effect for residential viewers close to them. It is difficult, too, to assume that vegetation planting will mitigate their adverse effects because of their height and bulk: see the effect of the transmission tower in Figures 40 and 41 of Mr Wyatt's evidence-in-chief.⁷⁶

[98] Meanwhile, we consider there are three locations in the Turitea Reserve, namely Game Ridge, Back Ridge and Hardings Park Ridge, where roading to the proposed individual turbines will impact significantly on its natural character. These we have addressed under Chapter 8, 'Terrestrial Ecology of the Reserve'. Otherwise, the roading width aspects, while initially proposed at 10 metres wide, were earlier intended by the Board to be reduced back to 6 metres and re-seeded at the end of the project. A site visit to *Turitea* confirmed what we had seen in PNCC's decision (adopted 30 October 2006) *Alteration to Purpose of Turitea Reserve and Amendments to Management Plan*⁷⁷ – that the existing roading in the reserve appears (from some of the photographs) to be rock based, with existing side clearances appearing to exceed 10 metres along most of the *Turitea* main stem ridgeline. And if these 'roads' are seen at all, they are already seen. Only parts of the existing water catchment access road appear to be 6 metres wide. This became relevant information because initially we had considered the road width was 6 metres throughout to be widened to 10 metres to take construction of the wind turbines. South of Marima, along the boundary with Tararua Forest Park, there are two sections of road which are to be realigned. During the hearing we learnt from Mr Brown,⁷⁸ and then anecdotally since the inquiry hearing was completed, that this reduced width may be achievable along much of its length through the use of developing new technology, ie, the use of narrow-wheelbase cranes for tower erection. Following the request in our Draft Report for advice on the availability of narrower wheelbased cranes, MRP responded that these were now available and that, as a result, the access roads could be narrowed to 7.5 metres with the provision for passing bays. This is discussed in more detail in Chapter 5.

[99] If ever the turbines are removed, the concrete foundation platforms will remain. They will, in time, sustain limited revegetation in Dr Rapson's opinion, and in our view are most likely to create a patchwork appearance in the native bush compared with the regrowth in the rest. Mr Bray in referring to these platforms considers the landscape environment is 'going to end up with a gap in vegetation no matter what you try and do'.⁷⁹

[100] With respect to substations, Mr Wyatt identifies that of the two proposed – one at Browns Flat to the south-west of the site, and one in an area of pine

⁷⁵ Wyatt, paras 13.2–13.5.

⁷⁶ Ibid, paras 11.26–11.30.

⁷⁷ PNCC Document Bundle Volume 1, Section 1, Appendix 5(i)(ii)(iii).

⁷⁸ Brown, *Turitea Wind Farm Assessment of Landscape and Amenity Effects*, 2008, p10.

⁷⁹ Bray, NOE 3278. But see Anstey, EIC para 12.

forest to the north-east – no element will exceed 15 metres in height and their relatively low overall profile means they are seldom visible at their locations from 1 kilometre away. Mr and Mrs Adams wish to have the substation on pastoral land near Browns Flat moved for amenity reasons, but there was no other focus from submitters on this issue.

[101] Mr Wyatt sets out an example of a substation in the AEE. It is a large industrial facility, but sits discreetly on the edge of Browns Flat, and with an overall footprint, including the switch yard of 300 metres by 200 metres, the building will be 15 metres high. There is potential to plant out in a way that blends with the native revegetation planned elsewhere, but considerably more extensive planting than a simple perimeter strip will be required. Otherwise, we consider Browns Flat substation is one area where thoughtful mitigation planting may well assist the Adams' concerns in part.

Finding on Support Infrastructure

[102] Transmission lines will have significant effects, but landowners have granted permission where these are located on private pastoral land. Planting is unlikely to mitigate these effects for other rural residential dwellers.

[103] In its comments on the Draft Report, MRP provided details of a realignment of the transmission line through the reserve in response to concerns we had raised over unacceptable visual impacts of a section of the original alignment. We discuss this in more detail in Chapter 5.

[104] Tracking in areas of existing native vegetation will have significant effects. Where this tracking is beyond the existing access road and into undisturbed vegetation, the effects are unacceptable and should be avoided altogether. This is discussed in detail in Chapter 8.

[105] The landscape and visual effects of the substations are mitigated to a significant extent by their discreet locations, and can be further mitigated by planting. This planting must be more than perimeter planting and in Browns Flat it needs to integrate with the revegetation design of the wider area.

Mitigation by Planting

[106] Mr Wyatt was of the firm view that mitigation by planting is the solution to the impacts of the wind farm 'on significant locations', ie, residential properties. Mr Brown, as we have seen, was not of the same opinion. Mr Anstey responds that at Ngahere Park, for example, it would be his opinion that if the existing pines are potentially a mitigating factor of the turbines from residential viewpoints (they are from a list of properties), they would need to be replaced with native plants to a similar height as the plantations. 'There is no way that natives would grow to the height of the pines in 100 years because they are so slow growing, although pines, cypresses or eucalyptus and acacias might provide

mitigation in a relatively short period of time’.⁸⁰ In questioning he agreed that mitigation by planting is not entirely out of the question but the issue is whether or not people would want to do that.⁸¹ Mr Bray gives numerous reasons why attempting to screen turbines in this environment is not sufficient for residents in the foothills.⁸²

[107] Some submitters explained that they did not like trees being so close to their home and had their houses set back within their boundaries, so they could retain their views of the hills.⁸³ Others showed how difficult it would be for them to protect their outward views from the turbines on Bryant Hill because they have deep valleys in front of their homes.⁸⁴

[108] Many of the older houses in the foothills in fact are surrounded by shelter planting (from wind) but many of the homes we visited had built to the view – ie, to the ranges or across the ranges and were largely north-facing while others have built to have views over Palmerston North.

[109] What is important in the circumstances of this case is that Mr Brown, a New Zealand landscape architect of substantial landscape experience, differed from his colleague Mr Wyatt in the use of planting as sufficient mitigation. From what occurred in the redesign, Mr Brown’s option for addressing significant adverse effects appears to be ‘avoidance’, in terms of s5(2)(c) RMA, that is, deletion of the offending turbines or their relocation within the turbines zones as a remedy so they do not appear to create the ‘most dominant’ effects – or even ‘most overly dominant’.

Finding on Planting

[110] Planting as a general mitigation technique for dominant turbines in the *Turitea* situation where residents are badly affected is not appropriate.

[111] Given this finding, in its comments on the Draft Report, MRP elected to remove a condition it had originally proposed for providing landscape screening advice to private landowners affected by the wind farm. The Board accepted that, given its findings on vegetative screening, this was reasonable, despite a request from Dr Huffman in her comments on the Draft Report that it be reinstated.

Public Perception Studies

[112] Mr Wyatt concludes that there are very limited views of the ranges from Palmerston North and, anyway, it is not possible to mitigate the visual effects from several elevated locations. While they may be ‘more than minor’ the effects are ‘not of such significance in themselves to preclude consent’ because the

⁸⁰ Anstey, NOE 1598.

⁸¹ Ibid, 1598–9.

⁸² Bray, EIC paras 129–131.

⁸³ #664 Devey, #317 Huffman, Submissions.

⁸⁴ #301 Low, Submissions.

community perception studies undertaken in New Zealand and internationally consistently show that the clear majority of viewers' support or at least are not averse to the presence of wind farms, except in all but the most sensitive locations.

[113] The public perception studies, and the public's approval rating for *Turitea*, is partly Mr Wyatt's ground for dismissing any adverse effects from the *Turitea* turbine field from public viewpoints. We hesitated over the high percentage approval rating given in those studies, for the reasons given in Chapter 11. Dr Layton for MRP also has reservations, as discussed in Chapter 4, because the reasons show that these ratings vary considerably depending on where the residents live.

[114] While Mr Wyatt and other members of the caucus considered perception studies are useful (Mr Wyatt considered they are useful for visual amenity assessments because they show the difference between wind farms and other forms of more invasive infrastructure in the landscape),⁸⁵ and because of the clean renewable energy benefits they bring, Mr Anstey, Ms Lucas and Mr Bray believed they are of only limited use for such assessments. Mr Anstey considers that:

The critical issue is one of perception. While I might agree with Mr Wyatt that perception studies can help in comparing different forms of development in my opinion they are of very limited use in assessing the values of the landscape itself and whether these values can be sustained by either of the options Mr Wyatt might wish to compare.

Under the Resource Management Act it is my understanding that its purpose is to sustain resources in the relationships individuals and communities have with those resources. Managing the landscape of the northern Tararua's and foothills to sustain relationships of importance requires an understanding of the particular values and relationships existing.

Perception studies of other communities living in other landscapes are unlikely to assist in gaining this understanding. Mr Wyatt's assessment is entirely focussed on the sensitivity of the viewer, a globally average viewer in an unspecified landscape with a wind farm in it, rather than on the significance of the Tararua Ranges and foothills, firstly, in the context of legislation, policy and ecology and, secondly, in the context of those individuals and communities who have an association with the Tararua Ranges and foothills.

Mr Wyatt's now limiting exploration of perception is simply not adequate, which is why his position was not supported by the rest of us.⁸⁶

⁸⁵ Wyatt, EIC para 5.7.

⁸⁶ Anstey, Document 21, *Turitea Wind Farm Proposal – Introductory Remarks of Clive Anstey*.

[115] Mr Wyatt responds to this saying:

I did not base our study on perception studies. We did a visual assessment that was set aside from that. What the community studies do is test our results and support them in a way that is unique.⁸⁷

[116] MRP generally, and through its landscape witness Mr Wyatt, gave great emphasis to the fact that the public perception study highlighting the high level of support for *Turitea* at 60% of those who live within a 15 kilometre radius of the project area, from data collected by Research New Zealand, meant that the whole project is more or less underwritten or endorsed by members of the public of Palmerston North. This emphasis appears directed at the impact the wind farm will have on both the public and the foothills communities.

[117] Mr Wyatt may have carried out his visual assessment separately from the perception studies. But what he does do is use them as a mitigatory tool where he finds the effects of the wind farm on public viewpoints are more than minor ('high', 'significant') and so on.⁸⁸ We asked the question how could the majority of participants in the study know what is at stake if they were not potentially affected by noise, amenity and so on? We do not accept Mr Wyatt's opinion.

[118] We were therefore interested to read in *Visual Assessment of Wind Farms Best Practice: Scottish Natural Heritage Commissioned Report*⁸⁹ under 'Public Attitudes' that (like the Research New Zealand study) there is broad support for renewable energy in general and 80% public support for wind farms internationally but there are 'important' and 'significant differences in attitudes and opinions in the particulars'. It is recorded there that the authors of the report 'had not discovered any public attitude or opinion surveys that address the specific issue of the relationships between turbine, size, distance, visibility and impacts'. This did not happen in Palmerston North either – either through public consultation or consultation early enough with the residents by MRP about such matters. This should have been a factor in putting together a large energy proposal which had every hallmark of focusing concerns on noise, and landscape and visual amenity issues in particular.

Finding on Public Perception

[119] We do not consider a public perception study is an acceptable basis on which to 'mitigate' significant adverse effects to a controversial wind farm. We see it as an indication of support for the generation of electricity by the wind farm. But that support is not justification for proceeding irrespective of adverse consequences which may be 'significant' – even 'unacceptable'. We draw attention here to the fact that several of the most affected submitters against the proposal generally approved of wind farms as important to the production of renewable energy and as an effective tool against climate change; these were submitters who agreed to a limited number being sited in the *Turitea Reserve*.

⁸⁷ Wyatt, NOE 1144.

⁸⁸ Ibid, NOE 1145.

⁸⁹ PNCC Document Bundle Vol 1. FOIAA303A 2002, para 3.10.

The Public Viewpoint Factor – Notified Proposal

Evidence and Discussion

[120] After dividing his analysis into the visual impact of the proposed wind farm from publicly accessible viewpoints, and those from residential viewpoints, supported by extensive photomontages and diagrams, Mr Wyatt's overall conclusions from the publicly accessible viewpoints are that the visual impacts will be minor (or less) due to:

- the distances from the turbines;
- existing screening;
- low viewer numbers;
- the limited duration and 'background' nature of any views that would attract large number of viewers.

[121] Mr Wyatt introduced a series of Public Viewpoints (VPs) of the project in a series of photomontages undertaken by his Australian firm. These ranged from VP1 *Kingsgate Motel* [sic], VP2 *Fitzherbert Ave*, VP3 *Massey University*, VP4 *Turitea Road*, VP5 *Ngahere Park Road*, VP6 *Aokautere Drive*, VP7 *Makomako Road*, VP8 *Pahiatua/Mangahao Road*, VP9 *Sports Oval*, *Tararua College*, VP10 *State Highway 2*, VP11 *Awapuni Racing Club*, VP12 *Palmerston North Rugby Ground*, VP13 *Waterloo Park-elevated embankment*, and VP14 *Palmerston North Golf Course*. Mr Wyatt's defined areas of visibility demonstrate that these indicative viewpoints generally located in the north west and south east of the site should be within his 3.5 kilometre viewshed zone (visually evident and potentially dominant), and from there (depending on location) within the 3.5–8.5 kilometre viewshed zone.⁹⁰

[122] The caucus of landscape experts agreed that the selection of viewpoints undertaken by Mr Wyatt was fair and representative, that there are limits on the number of viewpoints that can be simulated, and it was agreed that the numbers simulated by Mr Wyatt were adequate. This was confirmed in the hearing by Mr Anstey.⁹¹

[123] Due to the surrounding topography there are no areas Mr Wyatt considers from which viewers could see more than 79 of the proposed turbines in their totality. But in questioning, Mr Wyatt acknowledges the 'massing of turbines' along the Tararua horizon on which the turbines are to be located does create a visual impact.⁹²

[124] The photomontages of public viewpoints presented by Mr Wyatt appeared to the Board to be generally taken in a range of conditions including hazy, mixed cloud and sunlight, clear, or cloudy conditions. They demonstrate the groupings of the turbines from their identified locations as clearly apparent–striding across the ranges, disappearing into partial cloudiness as 'dandelions on a

⁹⁰ Wyatt, EIC para 9.6(d).

⁹¹ Anstey, Document 21 Turitea Wind Farm Proposal – Introductory Remarks of Clive Anstey, p2.

⁹² Wyatt, EIC paras 9.6(d) and 10.15(a).

stick’.⁹³ Or they presented, as serried ranks of tiered rows of spaced turbines extending away into the distance, such as we see in VP1 *Kingsgate Hotel*, VP7 *Makomako Road Looking west through to northwest*, VP9 *Sports Oval, Tararua College, Pahiatua Looking west through to northwest* or VP10 *State Highway 2 Looking northwest*, and so on.

[125] A particular difficulty arises for viewers where the turbines are placed on foreground ridgelines with little vegetative or topographical mitigation so they present as a thicket (or ‘massing’ to use Mr Wyatt’s word) of turbines, complicated by ‘cross-over’ turbines which appear to collide with each other.⁹⁴ It is around these foreground ridgelines that small rural residential communities of Palmerston North live, some of them potentially confronted by these ranks of turbines as they will move around their properties, in and out of valleys and onto the roads.

[126] In his further *Assessment of Landscape and Amenity Effects* (2008) Mr Brown concluded that, given the scale of the development, it is hardly surprising that the impact ratings for the 16 public viewpoints he originally provided to MRP typically ranged from ‘moderate’ to ‘moderate/high’. In describing that the wind farm resulted in higher (adverse) ratings than he expected, Mr Brown concluded the wind farm would be visually prominent over 12 kilometres from *Turitea*, as opposed to Mr Wyatt’s opinion that it would be only potentially noticeable at 8.5 kilometres. He concludes (unlike Mr Wyatt), that a very wide range of audiences would therefore be exposed to the wind farm, from local residents and farmers to tourists and those using local commercial centres.⁹⁵

[127] In fact, in his evidence-in-chief, Mr Wyatt identified public viewpoints from which the wind farm is likely to have ‘significant’ or ‘high’ visual impacts these being VPs 1, 2, 3 and 7. We examine them here.

VP1 Kingsgate Hotel Fire Escape Stairway

[128] Mr Wyatt considers this photomontage is representative of the elevated views towards the ranges that may be obtained from some of the taller buildings in Palmerston North and decides:

- the closest turbine WT88 is 7.96 kilometres to the north – the turbines therefore do not dominate but the massing does create a visual impact;
- the relevant landscape units are ‘urban areas’ and ‘cleared ranges’ both having medium sensitivity to change;
- overall viewer numbers are medium.

⁹³ *Friends of Turitea Reserve Society Incorporated v Palmerston North City Council* (HC) CIV-2006-454-879 per Baragwanath J, para 103.

⁹⁴ Such examples are seen in Wyatt VP6 *Aokautere Drive* before the redesign at 4.97 kilometres south east from the nearest turbine and VP7(b) *Makomako Road* 1.8 kilometres north west from the nearest turbine.

⁹⁵ Brown, *Turitea Wind Farm Assessment of Landscape and Amenity Effects*, 2008, pp53–55.

[129] Mr Wyatt considers it is not possible to mitigate such visual effects from such locations. Whilst the effects are more than minor, he considers they do not preclude consent because:

- such views and effects are limited in extent and there are no expansive views to the ranges from Palmerston North;
- ‘community’ perception studies demonstrate that the majority of viewers are not averse to the presence of wind turbines.

VP2 Fitzherbert Avenue

[130] In this photomontage, indicating the nearest WT88 at 7.8 kilometres, Mr Wyatt considers this viewpoint, with the Tararua Ranges terminating the vista at this location, represents a key pedestrian and vehicular axis, with high viewer numbers located in Palmerston North. In his AEE assessment Mr Wyatt determines the viewer numbers as ‘high’ and the overall visual impact as ‘more than minor’ – that is ‘significant’, ‘high’ or ‘unacceptable’ in his reinterpretation of ‘more than minor’. In his text describing his Figures 8.5, 8.6 and 8.7 he determines that ‘in the event that this view and the preservation of the ranges was considered to be important in this context, then the removal of 5–6 turbines would be sufficient to retain this vista’.⁹⁶

[131] In his evidence-in-chief Mr Wyatt changes his original text slightly. It is ‘a common view experienced by many Palmerston North residents and visitors’. He assesses the effects of the turbines from this viewpoint also as being ‘more than minor – short of removing 6–10 turbines’. In his opinion, in the light of the positive results in the perception studies, he cites such action is neither necessary nor warranted, together with the fact that only a very small group of turbines would be seen in this location.⁹⁷

VP3 Massey University

[132] Mr Wyatt next addresses VP3 *Massey University* as having more than minor visual effects on the university’s views to the ranges, which is not screened by trees or buildings. He assesses the effects as having (significant or high) visual effects on such views given the relative proximity of the nearest turbines 5.75 kilometres (WT88), and 6.6 kilometres (WT133) which are medium sensitivity landscape units (urban area and cleared ranges). He considers that mitigation planting is not warranted here because of the high degree of planting already undertaken around the university (for campus amenity and shelter); it therefore seems preferable to leave such views. In any event, he also notes the viewpoint is taken from the edge of the carpark, not typically recognised as having high amenity values; any visual impact is therefore transitory.⁹⁸

⁹⁶ Wyatt, Turitea AEE Assessment of Landscape and Visual Effects, para 8.2.

⁹⁷ Ibid, EIC paras 10.17–10.18.

⁹⁸ Ibid, EIC paras 10.19–10.21.

VP7 Makomako Road

[133] VP7 *Makomako Road* is also described by Mr Wyatt here but we discuss it towards the end of this section of the chapter because it is also affected by the Groups D and E (public viewpoint) turbines.

Viewpoints from Sports Centres

[134] From the various sports centres identified by Mr Wyatt, he concludes because of:

- the distances of these facilities to the ranges;
- the intervening man-made modifications in these views;
- the focus of the various patrons that would be on the games being played not on the views;
- the presence of existing vegetation in some VPs;
- the low viewer numbers in some locations, which renders the turbines in these public viewpoints only ‘potentially’ noticeable, or visually insignificant ... the results in these locations are only minor;

there will be no substantial or high levels of impact caused by the wind farm on publicly accessible viewpoints.⁹⁹

[135] Mr Anstey challenges Mr Wyatt’s findings point by point on his public viewpoint analysis coming to opposite conclusions.¹⁰⁰

[136] And before the redesign under the heading ‘aesthetic’ Ms Lucas provides a strong analysis in the context of the accepted landscape criteria.¹⁰¹ We do not provide a full analysis here but it is sufficient to provide a window on her concerns noting:

- the Tararua Ranges ridgelines and skylines provide a very important natural landscape value to Palmerston North city and the rural plains;
- the proposal involves a plethora of large structures on ridgelines intruding into the skyline of the range ... the land would read for many as a plinth for the kinetic structures above;
- the detail, complexity and subtlety of the multiple ridgelines and subtle peaks on the ridgelines would lose their appeal with the distraction and detracting of the large kinetic structures.

[137] This witness concludes that, read together, the high, light structures frequently overlapping behind and above one another, would, out on the plains read together as a complex mass of structures, and the elegance that might be

⁹⁹ Wyatt, EIC paras 10.51–10.53.

¹⁰⁰ Anstey, EIC paras 11–17.

¹⁰¹ Lucas, EIC paras 20–50.

enjoyed of individual structures would be significantly diminished by the complexity of the turbine mass when viewed overlapping, moving at different speeds and not synchronised.¹⁰²

[138] This is how Mr Brown describes part of the Turitea site and the wider range and which has been identified earlier:

Turitea, in particular its main ridges, are part of the continuum of the subalpine montane land that stretches across the Tararua Forest Park and extends northwards towards the Ruahine Range. It is a focal feature in views from Palmerston North, across the Manawatu Plain and from valleys of the Tararua District.

As such, the wider range is undoubtedly a signature feature in relation to the communities of both areas and the mantle of native forest along the crest of the range from Tararua Forest Park to almost the Pahiatua Track, reinforces the sense of naturalness and integrity associated with the main ridge sequence. Clearly Hardings Park and possibly Turitea water catchment have a feeling of being part of the periphery to the core Tararua Range.¹⁰³

[139] In questioning, the witness acknowledged that the views down Fitzherbert Avenue and from Massey University symbolised part of the area he describes above.¹⁰⁴ We note public views from these vantage points were two of those from which Mr Wyatt stated that the turbines were to have ‘high’ impact.

[140] Ms Lucas’ attachment 16, demonstrates the views from *Wyatt public viewpoint 01 Kingsgate Hotel – left half of Turitea turbines* illustrating the landmarks of Ramiha behind, Mairehau (Bryant Hill) down to WT21, and *Wyatt public viewpoint 01 Kingsgate Hotel – the right half of the Turitea turbines* illustrating the landmarks of Marima and Tirohanga with the locations of WT22–WT119. These viewpoints demonstrate a wide horizon from that viewpoint with a massing of turbines.

[141] Contrary to Mr Wyatt’s conclusion that there are few public viewpoints from which the wind farm would be seen, the double-spread panoramas of Ms Lucas’ attachments 14–17, based on Mr Wyatt’s own photomontages, portray a very wide horizon with expansive views towards them. They provide examples of the broad views of the ranges the city might enjoy, the full expanse of the wind farm being clearly visible from these viewpoints as well as from the higher public buildings such as the Kingsgate, the State Insurance building (9 kilometres away) and the Palmerston North Hospital.¹⁰⁵

[142] In particular, Ms Lucas demonstrates the impact of the full field of turbines in her attachment 24 *Wyatt public viewpoint 03* and cumulative viewpoint

¹⁰² Lucas, EIC para 123.

¹⁰³ Brown, Exhibit 9 Turitea Wind Farm *Preliminary Assessment of Landscape and Amenity Effects*, 2006, p39.

¹⁰⁴ Ibid, NOE 3075–3076.

¹⁰⁵ Lucas, EIC attachment 15.

01 Napier Road looking east through to southeast; and attachment 25 Wyatt public viewpoint 06 and cumulative viewpoint 01. While *Motorimu* (which is pictured in Lucas attachment 25) has been withdrawn and therefore is no longer part of an accumulation of wind farms in that attachment, both her exhibits nevertheless identify the various landmarks on the ranges – Pahiatua Track, Mairehau (Bryant Hill), Marima and Tirohanga – along and over which the turbines traverse.

[143] It is not only these viewpoints that gain wide views of the ranges. Viewpoint VP4 from Turitea Road, being the SH57 turnoff from Aokautere Drive, illustrates the wide view of the ranges from this busy road, with turbines from Marima to south of Tirohanga in clear view. Turbines on the Back Ridge, Game Ridge and Love Ridge all impact on the scenic qualities of the skyline, and on what we have found to be an ONF within the reserve, collectively impacting on ‘the mantle of native forest along the crest of the range and the sense of naturalness and integrity associated with the main ridge sequence’, which Brown refers to as being a signature feature in relation to the local communities.¹⁰⁶ Collectively, we consider from these viewpoints the turbines have a significant and major adverse impact.

[144] When assessing the effects from VP4, Mr Wyatt described the viewer numbers as low and the distance to the nearest turbine (visible from this location) as 6 kilometres to WT133. He stated that the road is primarily used for local travel and would have low traffic numbers. This contradicts with the fact that the road is part of SH57, being a busy highway carrying both local and regional traffic.

[145] Mr Anstey makes an interesting observation in answer to criticism from Mr Love who questioned him that there were limited opportunities for visibility of turbines from Kahuterawa Road. While acknowledging that views were limited, he found that this did not belittle their importance. In fact, the opposite can occur and such views can take on greater importance due to their mystery and prospect. He cited the example of Swedish forest management, where trees are deliberately retained or cut to control views from the road, with the result that such views are more greatly appreciated by motorists.¹⁰⁷

[146] Such a situation not only occurs in Kahuterawa Road, but similarly occurs for a far greater number of motorists on SH57 at VP4 where a panoramic view of the ranges is presented, with clear views of the ONF ridges and skyline within the Reserve. Turbines along Back Ridge, Game Ridge and Love Ridge collectively impact on the landscape character of these features. If turbines were removed from one of the ridges, the effect of turbines on the remaining ridges would increase. Similarly, if turbines were removed from two of the ridges, such as Back Ridge and Game Ridge, the effect of the remaining turbines on Love Ridge would be particularly apparent. While VP4 has been used in this discussion, retention of Love Ridge in isolation would have similar issues for other public and private viewpoints, such as those discussed by Mr Brown and some of those illustrated by Mr Baker in his photo booklet.

¹⁰⁶ Brown, Exhibit 9 Turitea Wind Farm *Preliminary Assessment of Landscape and Amenity Effects*, 2006, p39.

¹⁰⁷ Anstey, NOE 3200–1.

[147] The full exposure of the turbines on the Tararua Ranges will also be seen from the various sporting centres, which currently have similar views to the FMG Stadium. For the other landscape settings these centres provide, the ranges provide a significant visual amenity close to the city. It was not, we considered, that the focus of the visitors would ‘only be’ on the events taking place. We were not provided with evidence to demonstrate this is the case.

[148] Mr Wyatt also did not assess the ‘City Grid Viewsheds’ as set out in Ms Lucas’ evidence attachment 13 *Palmerston North City Grid Vistas*. That provides a depiction of how many viewsheds exist from Palmerston North to the Turitea wind farm 9 kilometres away from Maxwells Line, Botanical Road, Cook Street, Rangitikei Street, Victoria Avenue, Albert Street, Ruahine Street, Weston Avenue, Keith Street, Roberts Line – giving some guidance to the location of the turbines with some numbered. Ms Lucas particularly addresses Wyatt VP2 *Ferguson Street and Fitzherbert Avenue looking east* in her attachment 19. It illustrates the viewshaft to the Tararua Ranges main ridge from the second row of traffic lights on the avenue.

[149] Mr Brown, like Mr Wyatt, found it very difficult to find locations from which the wind farm would be clearly visible and comments that intervening development, gardens and vegetation largely restrict such exposure to ‘key viewshafts down strategically aligned streets – such as Fitzherbert Avenue’, which at least appears to support Ms Lucas’ particular focus on Fitzherbert Avenue.

[150] Mr Anstey, however, points out there are at least eight major and several minor roads traversing the city that are oriented towards the wind farm. Also, there are parks and walkways along the boundary of the built environment from which the whole wind farm would be seen. This was further supported by Mr Baker’s photo booklet illustrating a range of roads that align towards the Turitea wind farm site and the public views that these would provide.¹⁰⁸

Finding on Public Viewpoints – Notified Proposal

[151] We conclude here that many of Palmerston North’s streets, public facilities and spaces gain clear views of the ranges, with some having varying exposure to individual segments and others seeing wider aspects of the wind farm site. These all contribute to the character and experience of the city, which the RPS describes as a backdrop vista in contrast to the region’s plains. Public views of this backdrop vista, particularly if the skyline and ONF of Back Ridge and Game Ridge had turbines, would be significantly adversely affected.

Impact of the Redesign on Public Viewpoints

[152] Mr Wyatt in his conclusion on the redesign states that only ‘minor gains’ are made by the removal of the identified wind turbines, especially those that are closest to individual houses or their removal has a ‘subtle’ overall impact and they

¹⁰⁸ Baker Document 17, PNCC Photo Booklet, 3 July 2009.

only ‘slightly reduce’ the level of visual impact through the minor alterations to the alignment of the turbines.

[153] We began this part of the chapter by identifying Mr Wyatt’s acknowledgement that if what he described as ‘a more than minor effect’ could only apply to non-complying activities, then his substitute or alternative descriptions of ‘significant’ effects, ‘high’ effects or ‘unacceptable’ effects become his descriptors for the effects the wind farm would have on the various public viewpoints. If Mr Wyatt, as MRP’s lead public and private viewpoint landscape consultant, concludes that the viewpoints he identifies as ‘significantly’ impacted upon by the wind farm are the recipients of only ‘minor gains’ or the impact is ‘slightly reduced in the redesign’, then his conclusion is the one we are left with. For as Mr Wyatt himself observes, addressing the adverse effects of the turbines in VP1 *Kingsgate Hotel* at this distance (7.8 kilometres from the nearest turbine), the visual effects from elevated locations could not be mitigated.¹⁰⁹ But it is not only from elevated locations that they could not be mitigated. Ms Lucas’ attachments demonstrate other public locations from which the turbines have a significant impact.

[154] And after discussing whether the Tararua Ranges were outstanding in terms of s6(b) RMA (at the risk of repeating ourselves), we note Mr Brown said this:

... it must be acknowledged that the combination of a major landform feature, extensive native forest, open pasture, and even exotic forests, still connotes significant amenity value because of the underlying ‘naturalness’ (i.e. non-structural /built character) of the landscape’s main building blocks and related qualities:

- the focal nature of the Tararua Ranges as a major topographic feature, especially when viewed from the wide expanse of the Manawatu Plains, Palmerston North and other local towns;
- the rural, largely bucolic nature, of views and outlooks towards much of the Ranges and even from within it;
- the relatively quiescent, tranquil nature of the landscape within and around the Turitea Reserve;
- the presence of a broad expanse of native vegetation within the Reserve, its connection with Tararua Forest Park and ancillary pockets of native vegetation around both.¹¹⁰

[155] As we have already noted, the Board sat for most of the inquiry in Palmerston North’s FMG Stadium, and in the days when the eastern skies were free of cloud, the Tararua Ranges presented as a significant visual amenity landscape including the foothills/footslopes as described by the landscape experts. And as a fact on those days, turbines from two other wind farms *Te Rere Hau* and *Tararua 3* could be seen very clearly from our vantage point, although they were not in the mainframe view. *Turitea*, however, was always centre stage.

¹⁰⁹ Wyatt, EIC paras 10.15–10.16.

¹¹⁰ Brown, EIC para 56.

[156] In addition, many of Palmerston North's streets described by Mr Anstey are within 6 kilometres of the proposed wind farm and while there is visual mitigation potentially in many of these views, the foothills and ranges generally remain prominent and therefore a significant feature of the views.

[157] Finally, on this issue of public views we acknowledge the *PNCC Photo Booklet* put in evidence by Mr Baker that contains 30 images of streets and reserves from which the *Turitea* site may be directly viewed. Here 'mere visibility' is not the issue. For where an important landscape is significantly affected by the presence of a massing or congestion of turbines, as here, its amenity values are significantly diminished. From our site visits and walks around the city, we confirmed many of Mr Anstey's opinions as to the invasive nature of the turbines from public viewpoints.¹¹¹

[158] The evidence indicates that the citizens of Palmerston North are riding, driving, recreating and walking as well as living in and around these foothills, with views over and up the ridges as a central backdrop to their activities. This situation is not at all like the turbine fields at *Te Apiti* or *Project West Wind*, both wind farms as a Board we visited, where views of turbines by adjacent residents 'up to' or 'over' those wind farms can be much less adverse because they are extensive turbine fields in greatly expansive landscapes. They can, in certain weather conditions, be called 'beautiful' or 'spectacular' in those settings. The construction of MRP's turbines on linear ridgelines to capture the wind resource in this area of narrow linear features makes them, however, much more invasive and prominent, if not dominant altogether, in the *Turitea* landscape in our view.

[159] Mr Brown told us he considered (inter alia) the impacts of the turbines on specific landscape features, (such as notable hills, knobs and/or intrusion of the turbines into middle distance views) by removing Group C Bryant Hill (East) and two of the turbines on Love Ridge and four of Group H that all the most dominant/prominent turbines had been removed. We come to the conclusion from carefully studying all the evidence that the remaining turbines on two notable hills or ridges were not affected by the redesign – namely Love Ridge and Bryant Hill (West).¹¹² We consider that in so many of the photomontages put in evidence it is these two features, when covered in turbines, which contribute to the isolated or picketfence effect noted by experts, and the intrusion into middle distance views as assessed by Mr Brown.

[160] Nevertheless, there were major gains for the landscape and visual amenity in the redesign. The worst of the cross-over effects of multiple turbines had been adjusted or removed and this was acknowledged by several of the experts, and Messrs Anstey and Baker were forthcoming in their praise about what had been achieved in the redesign.

[161] But whilst in the redesign some of the foremost turbines had been removed or relocated, even if we could still see some of the open pastoral landscapes of *Turitea Reserve*, it is our conclusion that the *Tararua Ranges* would no longer remain a significant amenity landscape without further modification

¹¹¹ Anstey, EIC para 57.

¹¹² See Pollock, NOE 3794.

because of the scale and range of the turbines affecting these public and private vantage points. We return to this issue when we have assessed the impact of the wind farm under the various ‘Groups’ identified by Messrs Anstey and Bray.

[162] What is happening at Palmerston North is that, as a matter of fact, there will be many public views of *Turitea* from the plains, from the city, and down the end of a number of viewshafts, as the local roads that wind in and out of and up and down the valleys and around the foothills. In discussing viewshafts, Mr Anstey considers that ‘framing the view’ (as occurs at the end of Fitzherbert Avenue and Kahuterawa Road as examples) focuses attention on the ranges – where they, the turbines, become the dominant features in the view.¹¹³

Findings on Redesign of Public Viewpoints

[163] *Turitea* is part of a focal feature in public views from Palmerston North, across the Manawatu Plain and from valleys of the Tararua District. It is part of a signature feature in relation to the communities of both areas, with significant amenity values.

[164] There were major gains for the landscape and visual amenity in the redesign, particularly in relation to nearby communities and residents.

[165] But even after the redesign it would no longer remain a significant amenity landscape without further modification because of the scale and range of the turbines.

[166] The remaining turbines on Bryant Hill (West) and Love Ridge were not affected by the redesign. The Bryant Hill turbines contribute to an isolated effect, while the Love Ridge turbines contribute to a picketfence effect across the Game Ridge sequence and skyline. Both effects are significant and adverse on amenity values associated with the signature feature of the *Turitea* Reserve as seen from public viewpoints.

Turbine Groups and Public Viewpoints

[167] Here we discuss the turbine groups as identified in the map in Appendix 8 attached to this report. In doing so, we begin with Group D and E at the northern end of the Back Ridge, progressing clockwise around the wind farm as we consider the other Groups.

Groups D and E – Back Ridge (North)

[168] Mr Brown describes the landscape as ‘mostly cut over, high country, native forest and shrubland with some areas of pasture’. The native forest and shrubland he identifies as extensive along the main slopes and valley corridors facing the Manawatu Plains and in the higher hill country and the main range

¹¹³ Anstey, EIC paras 58–59, NOE 3201.

further south. Areas of pasture and pine forestry exist on the edge of the reserve on its western, northern and north-eastern margins. He describes the more rounded ridges and hills in this area as giving way to the more dissected hill country down towards Tararua Forest Park. While he maintains the native forest and shrubland cover is restricted to 'lower level' shrub species around the main ridge crests and many of the proposed turbine sites, we have identified under Chapter 8 this is a rather sweeping generalisation which we address further below.¹¹⁴

[169] We find also that the turbines' locations when viewed from Palmerston North occupy what might be classified as three types of landscapes – the ONL and ONF in the Turitea Reserve and the skyline – the so-called 'working landscape' made up of pastoral lots, plantations and wood lots (with few obvious buildings) and – the cultural landscapes (made up of rural residential activity gardens, shelter belts and so on). The distances from the relevant public viewpoints are not a mitigating factor in this regard; the visual massing the turbines create on those locations collectively change the nature of the overall landscape.

[170] We acknowledge nevertheless that some people, particularly the landowners, will enjoy the landscape even if the remaining turbines are retained.

[171] Before the redesign, Mr Bray considered that the turbines in Group D (South Range Road, Primary Road) and Group E (South Range Road, Secondary Road) had less than minor visual effects, though he limited the acceptable turbines to north of WT27 in Group D. He considered the acceptable turbines contribute to the aesthetic continuum (of the turbines to the north) with development limited to high on the main ridgeline and running down from there but not continuing further to the lower foothills.¹¹⁵ In the context of Groups D and E, he identifies that the turbines run in a 'picket fence' arrangement along the top of the main ridgeline in two distinct rows. Because the ridgeline here is somewhat flattened for the most part, both rows of these turbines are seen at approximately the same location,¹¹⁶ while WT13 and WT14 sit slightly in front of the main row of turbines and effectively create a third row. Combined with an increase in the density of blades here, with WT7, WT8, WT9, WT108 and WT109, the effect in this area is a concentrated overlap of blades visible from a number of locations. This cross-over increases these turbines dominance, even though they are 12 kilometres away from the Palmerston North FMG Stadium. In Mr Bray's opinion, the removal of two turbines from this tight cluster would be beneficial in reducing the blade 'cross-over' effect.

[172] But while Mr Bray considers that these turbines in Groups D and E increase the recurrence of views of the turbines, he considers the distance at which this occurs is acceptable, as from the western side the main ridgeline of the ranges appears significantly set back from the dominant foothills. And north of Marima the ridge is seen as remarkably lineal and strongly coherent with the skyline north of the Pahiatua Track. He argues that in most locations from within 2–3 kilometres of the base of the footslopes, the ridge is completely screened from

¹¹⁴ Brown, EIC para 13–14.

¹¹⁵ Bray, NOE 2032–4.

¹¹⁶ Ibid, EIC paras 186–194.

view by this foreground topography. In his opinion, in the wider public views the effect of the turbines on this part of the ranges would appear as remarkably similar to the *Tararua 3* turbines and seen as their extension.

[173] At a more prescriptive level again, Mr Bray sees the landscape on the eastern (Tararua) side of the ranges as complex, with a number of small valleys and ridgelines running parallel to the ranges, although at a higher elevation. Here, the ranges appear to be subservient to some of the lower ridgelines, particularly the low foothills on the eastern side of the Mangahao River. There are few residences in this valley but, from the viewpoints visited, Mr Bray notes a smaller ridgeline is the focus of the view, while the ranges themselves have a significantly more distant appearance. A further dominant ridgeline rises up on the eastern side of the Mangatainoka River and again forms the dominant foreground ridge when driving along SH3.¹¹⁷ Groups D and E are the most visible on the eastern side of the ranges but they would also, in his opinion, be seen as an extension of the wind farms further north.

[174] Mr Anstey's concession in favour of any proposed turbines comes down to the 11 in Group E that he identifies at the northern end of the site; he considers that this number only could be (visually) contained, so that their effects were not unduly adverse for those living on the western side of the ranges. Further, he considers that the group to the south of Pahiatua Track on South Range Road, while having adverse effects, would have no more than minor effects for the residents of Palmerston North because of their location. In his view WT99–WT109 would be acceptable.¹¹⁸

[175] During the redesign process, Mr Brown deleted turbine zone 108 from Groups D and E and provided the relocation of turbine zones WT1–WT4, WT8–WT10, WT18, WT38–WT41, WT43, WT97–WT107 and WT109 away from the more exposed sites originally selected, so as to align them closer to the main ridge that covers South Range Road.

[176] After the redesign, Mr Anstey's opinion remained very much the same as stated in his evidence-in-chief. All of the proposed turbines would have adverse visual effects and only a few of the more distant turbines located at the back of the skyline as seen from the Manawatu Plains would be less intrusive as 'they could be absorbed within the broader vista of the hills and ranges'. The only change in his position is to include WT97–WT98 because the owner of an affected property on North Range Road has given written approval to their location.¹¹⁹

[177] Mr Bray, after the redesign, also considers the new layout along the top ridgelines on the ranges makes negligible difference to the adverse landscape and visual amenity effects, although he is pleased with the removal of WT108 and relocation of WT109 to reduce the diversity of the turbines in this location.¹²⁰ He observes it is not possible from VP1 *Kingsgate Hotel* to determine what impacts the redesign of the wind farm have had on the wider viewpoints – if any. But he

¹¹⁷ Bray, EIC para 190.

¹¹⁸ Anstey, EIC paras 114–115.

¹¹⁹ Ibid, SE para 24.

¹²⁰ Bray, SS paras 15–24. Resumed Hearing.

also agrees with Mr Brown's reasoning, however, that by moving turbines back from the more exposed ridgelines this is likely to have some positive effects from a selected number of viewpoints.¹²¹

[178] In terms of MRP's 'landscape review', Ms Lucas identifies that Mr Brown describes the redesign on the Tararua Range summit as some 24 turbines being 'relocated from mostly ridge spurs onto the main range summit'. She considers that, in assessing the Tararua Ranges backdrop to the city grid's valued vistas in the light of the redesign (such as east on Fitzherbert Avenue), none of the turbines on the Tararua skyline are proposed to be moved at all so there has been no revision in this section.¹²² Mr Brown disputes this, saying that Ms Lucas has incorrectly represented the number of turbine zones that have been relocated from their original position as outlined in her appendix. And he defends the redesign by observing that his revision was largely designed to address effects in relation to closer residential viewpoints rather than vistas from the city grid.¹²³

[179] Senior counsel for MRP sums up the issue here when he submits 'while the compromised landscape is part of the MRP case, the place of the ridgelines as a backdrop to the city [Manawatu] Plains is for determination'.¹²⁴

[180] Mr Anstey, in questioning from MRP, acknowledged that his very conservative approach to the number of turbines on the ridgelines had come from his involvement with the focus groups formed from the various communities around *Turitea* involved in questioning MRP's proposal. He acknowledged the emotion behind their responses had influenced the decision he had come to in the evidence he provided.¹²⁵

[181] We note those focus groups, however formed, were meeting when *Motorimu* had been agreed to by the Hearing Commissioners and *Turitea* was proposed to 'fill the gap in the skyline'. That feelings were riding high at that point in time is perhaps understandable. But equally, during the inquiry, many of the residential submitters, who were concerned for their own visual amenities, considered that some limited wind farm development could occur on *Turitea* in order to meet New Zealand's sustainable energy requirements. Whether they approved Mr Anstey's number of turbines or Mr Bray's was not explored and nor was Mr Baker's 'Acceptable Envelope Area' of 28 turbines which he formulated as PNCC's planner after the redesign and which he provided to us on Map Version 2 *Turitea Windfarm – 2009/2010 Turbine Zone Comparison*.¹²⁶

Makomako Road

[182] Because the turbines in Groups D and E affect other public views, we then turned to Makomako Road on the eastern side of the range and the

¹²¹ Anstey, EIC para 11.

¹²² Lucas, *Turitea Wind Farm Revision, Landscape Review*, para 3.

¹²³ Brown, NOE 3006.

¹²⁴ Davidson, MRP Closing Submission, para 13.

¹²⁵ Anstey, NOE 1531, Davidson MRP Closing Submission, para 6.

¹²⁶ Baker, SS paras 21–22, 2010 Exhibit 85, Resumed Hearing.

descriptions given there of the effects of the turbines on that ridgeline which differed quite markedly from those of Mr Bray. Mr Wyatt describes the VP7 *Makomako Road* photomontage series as located in the south-eastern side of the ranges almost directly west of Pahiatua. The area has medium traffic numbers and the most visible landscape unit (cleared ranges), which he assessed as having medium sensitivity. He says this:

However, I have assessed the visual effects of the wind farm from such viewpoints as more than minor, primarily because the closest turbine is only approximately 1.81km to the north-west, located on an elevated ridge. In addition, this is one of the few locations where the entire spread of the wind farm will be visible with approximately 45 wind turbines visible from this location. These turbines will be visible, and will dominate the landscape.

As with Viewpoint 3, it would be possible to mitigate these effects through the use of roadside planting (with the agreement of the relevant regulatory agencies). However, I do not consider this landscape to be of such sensitivity that any mitigation is presently necessary, or even recommended. This is because most people driving along Makomako Road will find the wind turbines on the ridge an attractive element. Roadside planting that obscures views to the wind turbines will also obscure views to this ridge, a very attractive element for users of Makomako Road.¹²⁷

[183] Mr Wyatt's Figure 16 *View from Makomako Road Looking west*¹²⁸ demonstrates the alluvial plain in the foreground and the (cleared ranges) foothills of the Tararua Ranges presenting as undulating pastoral lands with varying shades of green and little or no vegetation. Wyatt VP7 *Makomako Road Looking west to northwest* depicts the wind farm site with 45 turbines ranging across the landscape with the nearest turbine WT103 located 1.81 kilometres north west. This photomontage places the relevant expanse of the turbine field in a public context from this viewpoint.

[184] We looked, too, at Mr Brown's original public viewpoint Preliminary Assessment of Landscape and Amenity Effects: Viewpoint 2 Makomako Road near the Mangahao River.¹²⁹

[185] He identified the rating of existing landscape values in this location as follows:

- in terms of naturalness of the Tararua Ranges and their margins as having 'very high value';
- existing sensitivities in the vicinity of the Turitea site in terms of physical elevation, prominence, existing land use, vegetation cover and outlook/key views as also having 'very high value';

¹²⁷ Wyatt, EIC paras 22–23.

¹²⁸ Ibid, EIC para 7.14.

¹²⁹ Brown, Exhibit 9, *Preliminary Assessment of Landscape and Visual Effects*, 2006, pp25–26.

and in terms of effects, he assesses:

- the prominence in terms of the visibility/legibility of the wind farm to be dominant;
- the impact on physical landscape elements and its impact on the integrity of the Tararua Ranges as having severe effects;
- the impact on perceptual values (structure and patterns, visual coherence/unity, naturalness, rural character, level of intrusion) as having severe effects;

with the overall impact rating as ‘high’. This was a damning review and contradictory to Mr Wyatt’s analysis. But in spite of those earlier findings, in discussing the redesign, Mr Brown considers that ‘subtle improvements’ have been achieved through the deletion of WT108 from the ridge and relocation of turbine zones WT1–WT4, WT8–WT10, WT18, WT38–WT41, WT43, WT97–WT107 and WT109 when publicly viewed from this location.¹³⁰

[186] In assessing the effects of these elements of the revision on this location we addressed RVP19 *Makomako Road Looking west through to the north* which demonstrated a more coherent but still dominant turbine landscape 1.44 kilometres north west of WT103. VP19(a) of the same turbine series, however, illustrated somewhat more clearly some of the modifications made by MRP to the west from 933 *Makomako Road*. RVP19(b) 933 *Makomako Road looking northwest through to the north* indicates these views as even closer. These two latter photomontages overall demonstrated the mitigation achieved in the redesign from this part of Makomako Road, but nevertheless we considered they remained dominant and intrusive on the ridgeline.

Finding on Groups D and E Back Ridge (North)

[187] We agree with Mr Brown’s public viewpoint assessment of line effects of Groups D and E on Back Ridge – North from Makomako Road. This is that these turbines will be dominant and that their effects on the integrity of the Tararua Ranges will be severe. We examine possible mitigation for the affected residents who live on Makomako Road when we evaluate the effects of these turbines from the perspective of the private viewpoints and MRP’s redesign.

[188] In its comments on the Draft Report, MRP requested that three further turbines be added to this group of turbines. Our consideration and finding on this request are set out at the end of this chapter.

Group D South of Marima on Back Ridge (South)

[189] Mr Brown considered that south of Marima contained the most significant parts of the skyline within the proposed site. When it was put to him that a parallel drawn between WT16–WT39 delineates shrubland and forest and was the most significant part, Mr Brown acknowledged that most of South Range

¹³⁰ Brown, SE, para 19, Resumed Hearing.

Road (by which we consider he means the water catchment access road) has significant remnants of shrubland merging with bush and forest with a continuum that in effect exists for most of the length of the site, but nothing ‘so significant’ that it should preclude the location of the turbines on the ridgeline.¹³¹

[190] As noted earlier, Ms Lucas dissents to the proposal to locate turbines on the back ridge of the Tararua Ranges. She argued that the Tararua Ranges in this location are an ONL and an ONF. She does not agree with Mr Wyatt nor Mr Bray that any large turbines constructed along the summit of the range south from Ramiha between and across Marima or on towards Arawaru are appropriate in the context of s6(b).

[191] Referring to the scale of the turbines proposed, Ms Lucas refers to her Attachment 18 *Wyatt Public Viewpoint 2 Fitzherbert Avenue*, which illustrates 10 turbines across that street vista – namely WT21–WT27, WT42–WT43 from the Group D turbines – located on the main ridge. In her opinion, the aesthetic values of that significant public/private vista would be significantly affected by the turbines very obvious presence.¹³²

[192] In describing this location, Mr Anstey citing Mr Brown provides a more general view around Turitea Reserve–Hardings Park down the foothills on either side of Ngahere Park and Browns Flat.

The ‘internal’ forest landscape of the Turitea Reserve and part of the Tararua Forest Park has a high level of coherence and integrity. On the other hand, when viewed from ‘external’ locations, such as the Manawatu Plain or the river valley either side of Pahiatua, the landscape is substantially dominated by open slopes that are grazed, and a scattering of pine woodlots.” ... “Even so, the interplay of open pasture and the Tararua Ranges’ bush spine still creates a certain feeling of distinction and sense of place – certainly when compared with the landscapes of the Manawatu Plain and Pahiatua Track. The hills also afford a highly visible backdrop to Palmerston North, Feilding, Pahiatua, and related lowland areas that contribute to the rural character of the wider landscape. Consequently, the hill country around, and including, both Turitea Reserve and Hardings Park is consistent with an Amenity Landscape’.¹³³

[193] Mr Bray considers that south of Marima the turbines occupy a distinctly new part of the landscape and would lack coherence with the existing pattern of wind farm development. Using the scenic aesthetic model, he found that turbines north of Marima on the Back Ridge and in South Range Road, being his grouping D and E north of WT27, had less than minor effects on visual amenity.¹³⁴ He went on to conclude that these would be seen as an extension to existing wind farms further north,¹³⁵ and when seen from distant locations, such as Fitzherbert

¹³¹ Brown, NOE 3051–3053.

¹³² Lucas, EIC para 127.

¹³³ Anstey, EIC para 24.

¹³⁴ Bray, EIC para 188.

¹³⁵ Bray, para 195.

Avenue, turbines on the main ridgeline are at a sufficient distance to be acceptable if it is clear they have a logical ‘natural limit’. He considers the natural end point for turbines on the main ridgeline would be at the northern base of Marima (proposed WT27).¹³⁶ He considers certain turbines south of Marima ‘to be beyond the natural limit’ of the wind farm expansion on the landscape. His reason as to why he considers WT27 to be a ‘natural limit’ was that it was principally topographic coherence that gave him that stopping point, and beyond that point ecological values rise and access becomes more difficult.¹³⁷ He found that the main ridgeline from the existing Te Apiti wind farm through to Marima on the Turitea main ridge was the appropriate window for wind farm development. Turbines south of Marima would significantly increase the perceived footprint of wind turbines in the wider landscape.

[194] During questioning, Mr Bray accepted that an ecological aesthetic model rather than a scenic aesthetic model would be appropriate to use in assessing the turbines within the Turitea Reserve. Based on this, he modified his position regarding the extent of acceptable turbines along the Back Ridge. His original position was that turbines on the Back Ridge as far south as Marima were appropriate, but he acknowledged that he had struggled with the question of where exactly the end point should be. He suggested in response to questioning that WT11 could be an appropriate end point, but vacillated and concluded that WT8–WT27 would be marginal.¹³⁸

[195] MRP submits that there is no ecological reason not to extend turbines to WT27 and no reason through topography not to extend to WT33.¹³⁹ We disagree and the issue here lies with Mr Brown’s observation that ‘most of South Range Road has significant remnants of shrubland that merge with the bush and forest forming a continuum that exists along most of the length of the site’. As a fact, the roading alignment of Group D carries a number of turbines which require substantial disruptive earthworks in significant revegetating natural bush.¹⁴⁰ Mr Bray identified that turbines in this area of landscape were ‘marginal’ due to the ecological aesthetic values of this landscape. But while recognising the ecological factors between the Turitea Reserve boundary and the peak of Marima, he also considers that ‘the wider context to the landscape could be appropriate to consider turbines in this location’.¹⁴¹

Finding on Group D – Back Ridge (South)

[196] Turbines south of WT11 will have significant adverse landscape and visual effects. We have already set out in Chapter 12 our reasons for deleting these turbines. From an abundance of caution, we repeat those reasons here. Group D, WT15–WT29 and WT39–WT43, will adversely affect the valued public amenity views of the Tararua skyline and internal views of the Turitea Reserve’s

¹³⁶ Ibid, EIC para 89.

¹³⁷ Ibid, para 203, citing WT 33, 35, 55, 56, 58.

¹³⁸ Ibid, NOE 2096.

¹³⁹ Davidson, MRP Closing Submission, para 58.

¹⁴⁰ Such as WT38–WT41, WT43.

¹⁴¹ Bray, NOE 1985.

Back Ridge ONF from Fitzherbert Avenue and other public viewing points in Palmerston North. These turbines are to be deleted.

[197] In its comments on the Draft Report, MRP requested that WT15–WT20 be reinstated. Our consideration and finding on this request are also set out at the end of this chapter.

Groups G, F and H (Red Rock Knob and Hardings Park)

[198] Turbine Groups F and G (Browns Flat and Red Rock Knob) are identified as being located on the highest parts of the site running down a ridgeline from peak 622 and wrapping around an important local landmark Red Rock Knob at 556 metres, which is within Hardings Park.¹⁴²

[199] In his description of around Turitea Reserve – Hardings Park, and down the foothills of Ngahere Park and Browns Flat, Mr Brown describes the internal area of Turitea Reserve and part of Tararua Forest Park as having a ‘high level of coherence and integrity’. But when viewed from external locations, such as the Manawatu Plain, the landscape is substantially dominated by grazed open slopes with a scattering of pine lots. Although the bush and dramatically dissected terrain of the reserve and Tararua Forest Park remain partly visible, Mr Brown considers they are also partly enclosed and ultimately suppressed by the farm and forest landscapes that flank them. He considers pockets of rural residential development fronting Palmerston North erode the native and natural qualities of these areas. But on a more positive note, as noted above, he identifies the interplay of open pasture and the Tararua bush spine creates a certain feeling of distinction and sense of place.¹⁴³

[200] He goes on to discuss the effect the surrounding farmland has on screening the ONL of Hardings Park as seen from the west. He states that if you do get glimpses of the forest that makes up the backbone of this part of the ranges, and Hardings Park. These views, nevertheless, still tend to be dominated by the farmed foothills, even the areas of forestry which are more in the foreground. So in looking at the perception of Hardings Park from without, it is his assessment that the effects really related to the rural character for the most part, as opposed to the natural character of that environment.¹⁴⁴ Mr Anstey had a similar view, and even considered including the turbines in the southern end of the wind farm for these reasons, but ultimately dismissed them due to their effect on views up Kahuterawa Valley towards Arawaru.

[201] Hardings Park is a scenic reserve the status of which Mr Wyatt considers is not in itself a sufficient reason to decline the proposal.¹⁴⁵ He states:

Many views from Hardings Park are over the Manawatu Plain. The Sledge Track, which provides access to the Park, traverses closed

¹⁴² Bray, EIC para 215.

¹⁴³ Brown, EIC para 20.

¹⁴⁴ Ibid, NOE 3054.

¹⁴⁵ *Minister of Conservation v Marlborough District Council* [Environment Court] W 89/97, p11.

bush, and views are in the main internal to the bush. When reaching the high point of Red Rock Knob the Manawatu plain and the foothills in the middle distance are visible as obvious human-modified landscapes, which include the city of Palmerston North – an obvious non-natural element within the view from Hardings Park. Therefore views from the Park juxtapose “natural” elements with signs of human activity and built form.¹⁴⁶

[202] Mr Brown sees Hardings Park as the area where the changeover from the Turitea catchment into the ‘edge’ of what is effectively an extension of Tararua Forest Park (as an ONL) is seen very clearly.¹⁴⁷ But he agrees with Mr Anstey that views from Hardings Park in the redesign remain essentially unchanged – that while there has been some minor reduction of effects, the redesign process here has not made a significant impact. This is because the area offers such broad sweeping views of the wider Tararua landscape and the proposed wind farm.

[203] Mr Brown considers the turbines here would be dominant and create an adverse effect on views outwards from Red Rock Knob. Nevertheless, he determines that these effects have to be balanced against the very much more limited impact that the proposed wind farm would have in respect of the rest of Hardings Park. They are not sufficient to warrant the significant amendments required to address the impacts on Red Rock Knob in isolation.¹⁴⁸ In an oral addition to his evidence he added ‘I accept when looking from that viewpoint, (Red Rock Knob) views would be significant. But that viewpoint will have limited usage’.¹⁴⁹

[204] Mr Bray considers that the landscape unit containing Hardings Park and Turitea Reserve scores very highly as a special amenity landscape. In being questioned by counsel for the landowners about the views from Red Rock Knob, a recreational destination, he acknowledges that there would be locations on the bush walk through Hardings Park where views would be limited, but the most dominating effect would be when the walker emerges from the park and looks at the view.¹⁵⁰

[205] Mr Bray, in his evidence, explains that from the wider views – from the Manawatu Plains towards *Turitea* – the eastern portion of the Group G turbines are largely screened from view in the near distance by the foreground Tirohanga at the site of WT55 (now removed), and by the ridgeline of Game Ridge. He considers that, notwithstanding the cumulative effects of all turbines south of Marima, the additional effect of these Group G turbines in conjunction with the more foreground turbines is negligible as at most they contribute only to a degree of cross-over.¹⁵¹

¹⁴⁶ Wyatt, EIC para 3.7.

¹⁴⁷ Brown, NOE 3056.

¹⁴⁸ Ibid, OS para 17, NOE 2997.

¹⁴⁹ Ibid. Interpolation. We note here this is in contradiction to what he said in the first hearing: see Brown, NOE 2997–2998.

¹⁵⁰ Ibid, NOE 2082.

¹⁵¹ Bray, EIC para 216.

[206] But Mr Bray also agrees with Messrs Brown and Anstey that the greatest impact these turbines will have will be on the outward view from Red Rock Knob and says this:

This peak is a destination on the Sledge Track a walkway that rises up from the carpark at the top of the Kahuterawa Valley ... traversing through native vegetation and historical sites before reaching the knob when expansive views open up to reward the climber ... the walkway is unique in that it is one of the only publicly open tracks where views of the city can be obtained from a recreational reserve In conjunction with the Group H, J, K turbines they will significantly ... [change] the character of the immediate landscape from open bush to total immersion within a wind farm ¹⁵²

[207] Mr Bray therefore sees the 40 turbines in Groups G to K (and the residual Group D turbines) as a significant contribution to a 'perceived excessive occupation of turbines in [this] landscape'. He considers as a result there would be significant effects on local residents and the wider viewing audience. As a result, Mr Bray concludes that no turbines should be permitted in any part of this location – even after the redesign.

[208] No adjustment to the turbine zones in the Group G turbines was made by Mr Brown in the redesign. Mr Anstey did not consider them in his assessment of the turbines' effects on Hardings Park, only Groups H and F. Mr Bray was disappointed that the redesign failed to address either his evidence, or that of Mr Anstey and Ms Lucas, by retaining a significant number of turbines on the southern parts of the site. He does not consider that the removed or relocated turbines in this part of the site go anywhere close to reducing the potential landscape and visual amenity effects of the proposal. Although he agrees with Mr Wyatt that there have been subtle advantages gained from some selected locations, he believes that the remaining turbines would continue to dominate this part of the landform, and, for him, would be an unacceptable addition to the landscape in this particular location.¹⁵³

[209] In describing the landscape values of Hardings Park, Ms Lucas describes how, when the traveller walks up to Red Rock Knob, the Group G turbines would appear just to the north west. In that viewpoint, Toi Toi Flat 'presents like a bowl' and around that bowl 'there is podocarp bush to the skyline'. In enjoying that open space you can hear the trickle of the stream and hear the kereru above – it is a highly natural area with a very complex ecological sequence except for its transition areas.¹⁵⁴ In her opinion, the Group G turbines would enclose the bowl – and therefore have a significant impact.

[210] In her Appendix 3 *Viewshed from Red Rock*, Ms Lucas also portrays the very significant effect the Group F, G and H turbines will have on the outward views from Red Rock Knob.

¹⁵² Ibid, para 217.

¹⁵³ Ibid, SE (2010) paras 33–34, citing Wyatt SE (2010) para 4.6.

¹⁵⁴ Lucas, EIC para 133.

[211] Wyatt RVP20 (Amended Layout) and RVP21 (Amended Layout) also illustrate four turbine deletions from Group H which we consider are a significant improvement in this location. The series is peripheral to the view and in hilly topography, from several locations only half of two turbines are seen and the tips of two others. They are the northern-most turbines in that series and, in her Appendix 4, Ms Lucas illustrates their location on a hillock between two views of Palmerston North.

[212] Mr Brown's approach to the views from Red Rock Knob is that they are limited in scope, or the scale of those effects on Hardings Park do not justify the significant revisions that would be required to address the impact from one confined viewpoint and its relatively small audience.¹⁵⁵

[213] We do not agree with Mr Wyatt that because the view from Red Rock Knob is at the end of a three-hour walk its significance can be diminished or because amenity viewpoints have limited usage that downgrades their status. For the area is part of the recreational hub for Palmerston North which Mr Brown notes contains much of the same continuum of vegetation as the water catchment 'and is also used for recreational purposes, a function excluded from the water catchment'.¹⁵⁶ Our first consideration is that while it may have few visitor numbers now, no one can predict what may happen over 35 years and beyond to this recreational hub. In all likelihood it will develop. TAG and the FOTR and numerous submitters told us of PNCC's promotion of this area as a recreational destination and of promotion of the opening of Sledge Track which follows an old roadway to Hardings Park.¹⁵⁷ Ms Lucas, in her Appendix 3 *Viewshed from Red Rock*, demonstrates in red the extensive visibility from Red Rock Knob with a 2 kilometre range.¹⁵⁸

[214] Mr Anstey considers an (unspecified) number of turbines are very intrusive on Hardings Park,¹⁵⁹ with Mr Bray stating that Group F along with Group G will have a significantly dominating effect on the view from Red Rock Knob.

[215] We note that while both the Groups F and G can be seen in Lucas K2Vi screen shots from Red Rock Knob, Group F is in pastoral land to the left of that viewpoint. They are intrusive on the view across the plains, not on the view along Hardings Park.¹⁶⁰

¹⁵⁵ Brown, NOE 3007.

¹⁵⁶ Ibid, Exhibit 9 *Turitea Wind Farm Preliminary Assessment of Landscape and Amenity Effects*, para 2.2.

¹⁵⁷ TAG, *Discover Sledge Track Essence of Aotearoa*, PNCC Publication.

¹⁵⁸ Lucas, EIC Appendix 4, Photographs West and Northwest across to Te Mata.

¹⁵⁹ Anstey, NOE 1509–10.

¹⁶⁰ Bray, EIC para 219.

Finding on Groups G, F and H

[216] We concluded that most of the Group G turbines present a significant adverse effect on the outward scenic views from Red Knock Knob from a relatively confined viewpoint.

[217] We also empathise with Mr Brown's view that these effects have to be balanced against the very much more limited impact that the proposed wind farm would have in respect of the rest of Hardings Park and that they are not, in his opinion, sufficient to warrant the significant amendments required to address the impacts on Red Rock Knob in isolation.¹⁶¹

[218] We similarly empathise with the opinions of Messrs Brown and Anstey regarding the potential acceptability of turbines in the southern part of the site, acknowledging Mr Anstey did not ultimately support turbines here. We accept Mr Brown's evidence that effects really related to the rural character for the most part, as opposed to the natural character of that environment, with the rural side slopes screening the Hardings Ridge ONL.¹⁶²

[219] We similarly accept Mr Bray's evidence that external views from the west of Group G are screened to varying degrees by the topography of Game Ridge and Tirohanga. This can be seen in photomontages including VP4 and VP12. We find that turbines in Group F and H are primarily seen from the west in terms of a rural character rather than a natural character context. A more natural character prevails for views from the east. We consider their removal or otherwise under our Part 2 analysis in Chapter 19.

[220] We return later to discuss the effects on the Groups F and H turbines from private viewpoints following the redesign.

Group J – Game Ridge (Western Ridge)

[221] Group J, WT56–WT66, is on Game Ridge (described also as Western Ridge) and related to a dominant but short ridgeline that juts out into the Turitea catchment. Mr Bray states that, for the most part, the turbines are visually associated with the turbines in Group K and cannot be seen from locations on Greens Road or Kahuterawa Valley where they are 'largely screened from view, from external to the site'.¹⁶³

[222] Mr Brown does not consider the Game Ridge group as clearly distinguishable or discernable from other turbines when viewed as an entity from outside the site but within the reserve itself the group is 'reasonably prominent'.¹⁶⁴ Attachments 17 and 24 of Ms Lucas' evidence (of elevated viewpoints) illustrate that Game Ridge is distinct but a little less distinct than other parts of the skyline. Mr Brown does not see Group J as having a sense of distinction that PNCC does.

¹⁶¹ Brown, OS para 17, Resumed Hearing.

¹⁶² Ibid, NOE 3054.

¹⁶³ Bray, NOE 2068.

¹⁶⁴ Brown, NOE 3048.

He acknowledges nevertheless from an internal perspective, Game Ridge turbines would be clearly apparent in their own right.¹⁶⁵ He also observes they are visible (see Lucas attachment 17) or viewed in the backdrop on and around South Range Road. But when looking from Palmerston North or other external viewpoints it is difficult to distinguish or differentiate one grouping of turbines from another.¹⁶⁶

[223] While Mr Brown may have difficulty in distinguishing the Game Ridge turbines from the Love Ridge turbines or other turbines to the south and east, this does not lessen their visual presence when seen from the west. However, with the other turbines, they form part of a larger group. Without the other turbines, they would be seen clearly as a single entity located on a ridge that forms the skyline from Tirohanga to just south of Marima.

Finding on Group J – Game Ridge

[224] We find elsewhere that the Game Ridge turbines (apart from WT56) should be deleted for ecological reasons. In our assessment of public viewpoints from the Manawatu Plains and Palmerston North all of the Group J turbines (WT56–WT66) are seen clearly on the skyline (see VP4, VP12A, RVP8) and would have significant adverse effects on the natural character of this ONF. This reinforces the ecological reasons for their removal and also confirms our decision as set out in Chapter 12.

Cumulative Effects: Public Viewpoints

[225] Mr Wyatt sets out his approach to the potential for cumulative adverse effects arising from the wind farm noting that they be either ‘simultaneous’ – when more than one wind turbine is visible from the same location) or ‘sequential’ – where a viewer observes a series of wind farms one after another in a linear manner. Such effects can also arise in a number of ways:

- simple numerical additions of turbines in the landscape;
- increasing the number of wind farms visible within a view or views in different directions from a single viewpoint;
- increasing the number of wind farms experienced in sequence when travelling through a landscape.

[226] As there are no other wind farms proposed within the project area itself Mr Wyatt considers there would be no cumulative effects in terms of simple numeric addition and there is only the potential for both simultaneous and sequential cumulative effects.

[227] Mr Wyatt assessed simultaneous and sequential cumulative effects from eight separate sites, concluding that the simultaneous cumulative effects from the project will be acceptably minor. The main reason was distance from the

¹⁶⁵ Brown, NOE 3050, 3048.

¹⁶⁶ Ibid, NOE 3048.

viewpoint, while other reasons included limited locations in each area from which views could be obtained and low sensitivity of the relevant landscape.

[228] When considering sequential cumulative effects, Mr Wyatt compared the area from which wind turbines will be visible once *Turitea* is constructed, to the area from which other existing or proposed wind farms can already be seen. Using the seen area analysis, he found that there are few areas within the combined viewshed for all existing and proposed wind farms (including *Turitea*) that have additional exposure to wind turbines as a result of *Turitea*. The key areas from which sequential views may be obtained are along SH2, 3, 56 and 57.

[229] Considering sequential views travelling along SH57 to SH3, Mr Wyatt found that because viewers will only travel through areas from which turbines are currently visible, *Turitea* does not have the potential to create any sequential cumulative effects along this route. However, the addition of *Turitea* may increase the likelihood of turbines becoming visible generally. He noted that trees losing their leaves can increase the visibility of turbines. Based on these factors, he concluded that any sequential cumulative effects from this route will be minor, at worst, and acceptable.

[230] Mr Wyatt repeated that process for sequential views from SH2, finding similarly to above except that the greater distance from the viewpoint to the turbines meant that the impacts for viewers would be de minimus.

[231] While the existence of *Motorimu* is no longer in consideration, the *Te Rere Hau* extension will be just over 1 kilometre from the closest *Turitea* turbine. Citing a number of viewpoints from Woodville, Pahiatua, Ashhurst and Palmerston North, Mr Wyatt concluded that there were only a limited number of public viewpoints from which the *Turitea* turbines will be seen either simultaneously or sequentially with other turbines. And he considers there are few simultaneously panoramic views of the ranges from publicly accessible places. Sequentially, limited opportunity for views arises because the existing and approved wind farms mean this is an area where wind turbines are common – to the extent the landscape may be described as an ‘energy landscape’. Finally, there are very few locations from which existing or consented turbines cannot already be seen.¹⁶⁷

[232] Mr Wyatt nevertheless considers *Turitea* potentially to be part of the ‘energy landscape’ of the Manawatu. This, he says, may be created within a viewer’s mind based on transitory and segmented views. This model landscape can be built up in the residents’ or viewer’s mind and is a process which is referred to as a ‘cognitive landscape’ which results from frequent glimpses and denotes the overall picture of the landscape created in the mind of the viewer and so it can be described as a consequence.¹⁶⁸

[233] In the caucus of the landscape experts (with the exception of Mr Brown who was not present) all but Mr Wyatt concluded the cumulative effects of *Turitea* together with all the other wind farms are unacceptable. This was before

¹⁶⁷ Wyatt, EIC, para 12.7(a)–h.

¹⁶⁸ Ibid, SRE paras 8.1–8.4.

Motorimu was taken out of the landscape by MRP and before the *Te Rere Hau* extension consent was granted. Nevertheless the views of the remaining experts are worth recording here:

- the turbines on *Turitea* would fill the last gap on the city's backdrop;
- the variation in turbine style either side of Pahiatua Track would exacerbate the adverse visual impacts;
- there are internal cumulative effects because turbine rows overlap and the turbines register as dense groups from many viewpoints.

[234] Mr Brown's redesign has addressed a number of the so-called 'internal cumulative effects' resulting in better design effects. Further, the removal of many of the back ridge turbines for ONL and ONF reasons means the march of the turbines along the range has been truncated at WT11. Should *Motorimu* ever be resurrected, the significant amenity landscape currently presented by the Turitea Reserve will no longer be in jeopardy.

[235] Mr Anstey in his assessment of potential cumulative effects is critical that Mr Wyatt touches only briefly on the matter of travel as people go about their day-to-day activities. In his opinion, the combination of turbines being in views from houses as well as roads, parks and even workplaces makes them all-pervasive, because there are so many viewpoints from which *Turitea* and the other wind farms would be seen in the same view. 'There are many public views which take in the whole of the ranges as many of Mr Wyatt's images illustrate.' As an example, Mr Anstey describes the *Tararua 3* and *Te Apiti* turbines as being clearly visible from Longburn in clear light even though they are 8–10 kilometres away.¹⁶⁹

[236] When questioned about the extent of the views to *Te Rere Hau* from Pahiatua Track and Ridgeview Road, Mr Brown made the point that the terrain is very dissected and so the degree of visibility to individual turbines and to the wind farm as a whole varies from being completely screened to being quite exposed to it. As for the redesign, Mr Brown concluded that the redesigned proposal is not sufficient to achieve any greater separation from the *Te Rere Hau* extension. He acknowledged that from a number of locations within the settlement of Ridgeview Road *Te Rere Hau* may be seen in total or in part.¹⁷⁰ Mr Devey, a resident of 428 Pahiatua Aokautere Road, made the point that, from his home, his family members see 27 wind turbines from *Te Rere Hau*, the nearest being only 2 kilometres away. He observed 'this side of the hill looks really crowded now'.¹⁷¹ The Devey/Huffman homestead will already be one of the worst affected residences due to the multi-layers of the *Turitea* and the existing *Te Rere Hau* wind farms. We also had representations from a number of other submitters who identified, if *Turitea* goes ahead, they would have adverse cumulative effects from *Te Rere Hau*.

¹⁶⁹ Anstey, EIC paras 103–115.

¹⁷⁰ Brown, NOE 3016–3020.

¹⁷¹ #664 Devey, Submission.

[237] Ms Lucas considers the revision or redesign does not address the experiential overlap of the two wind farms.¹⁷² She, like Mr Bray, provides an assessment of the variety of turbine styles, differing heights and differing blade numbers and lengths and the varying scale and character of the turbine farms adjacent to *Turitea*. She makes an assessment of how the wind farms together would appear from Palmerston North identifying that *Te Apiti*, *Tararua 3* and *Te Rere Hau* are already clearly visible.¹⁷³ The addition of *Turitea* would therefore multiply the existing effects by extending across the main immediate slopes and the summit of the range directly associated with the city and directly visible from the main city viewshed and street vistas. In Ms Lucas' opinion, to extend the effects through quantity, density and spatial scale of the wind farms with the addition of *Turitea* to those already existing, would result in 'a bulk lot' aesthetic, spread down the ranges. She concludes by saying the landscape values of the range in this location would be very significantly affected by *Turitea*'s cumulative impact.

[238] In considering views from out on the plains, Ms Lucas identifies from those locations most views of the ranges would involve several wind farms. While she observes that there is enjoyment to be had from the visual elegance of seeing some turbines (such as some of the 55 at *Te Apiti* – an experience shared by the Board on its site visit to that location), the existing wind farms include a variety of turbine styles with obviously differing heights, structures of masts with differing blade numbers and lengths. Even absencing *Motorimu* from this equation, inserting *Turitea* with its elegant structures alongside *Te Rere Hau* would create considerable landscape and visual effects. For Ms Lucas identifies, while considerably smaller, due to the two-blade action, the *Te Rere Hau* turbines result in an apparent stilted movement – 'Closely spaced in a mass, viewed overlapping and not being synchronised the resulting agitated kinetic' results in a very different aesthetic than those proposed for *Turitea*. In her opinion, if *Turitea* proceeds (even as redesigned) the ranges would read from *Te Apiti* – down to Hardings Park – as one long wind farm (see Lucas attachments 14, 15, 16, 17).

[239] It is also Ms Lucas' opinion that the visual effect would be highly significant and adverse in terms of simultaneous, successive, sequential views and intervisibility. While no detailed analysis was carried out beyond referring to panoramas in her attachment and Mr Wyatt's cumulative photomontages, this conclusion appeared to be based on the fact that turbines would be located along the entire length of the ranges from *Te Apiti* to *Turitea*, they would be visible, and would be seen as a mix of styles, designs and layouts, and would descend down the side slopes as well as occupy the ridgelines of the ranges – ie, an analysis of the evidence of Messrs Anstey and Bray.

[240] Mr Bray began his evidence by referring to the cumulative effects that can occur with wind farm development in the Palmerston North area, noting that with the addition of the proposed *Turitea* wind farm, the resulting collection of turbines would result in one of the largest wind farms in the world. He, too, did not carry out a specific assessment of cumulative effects, but instead incorporated this into the initial part of his assessment overall. His premise was that, if an

¹⁷² Lucas, *Landscape Review*, para 7.

¹⁷³ Ibid, EIC paras 152–166.

aesthetically ideal window for development could be identified, turbines within this window would have acceptable cumulative effects. However, if development was extended beyond this window into potentially a new landscape unit, then the potential for cumulative effects would be significantly greater.¹⁷⁴

[241] Mr Bray considers that the different appearance of the *Te Rere Hau* turbines draws attention to its two-bladed machines which have a distinctive utility appearance which in turn has a negative impact on the potential aesthetic appearance of the whole linear array of wind farms along the ranges. He concludes this by comparing the *Te Rere Hau* turbines with the smooth sculptural rotation of the three-bladed machines on *Te Apiti* and *Tararua 3*. While the MRP turbines would have similar characteristics to those two wind farms they are noticeably taller – 20% bigger than *Te Apiti* – and 14% bigger than *Tararua 3*. Given the strongly coherent skyline along this landscape 6.5 kilometres from the southern-most wind turbine at *Tararua 3*, Mr Bray considers the difference in turbine height and proportion would be immediately discernable. Thus, introducing a third large ‘format’ turbine design in the landscape would have an adverse effect on the aesthetic coherence of the turbine fields and therefore amenity value. Before the *Te Rere Hau* extension was granted (as we were sitting), he considered that should any further turbines be consented on this skyline then they should very closely resemble the design of *Te Apiti* and *Tararua 3*. A maximum height of 110 metres would be appropriate together with a blade length no more than half the height of the tower as is the case with the *Te Apiti* turbines.¹⁷⁵

[242] Mr Wyatt examined the cumulative effects of *Te Rere Hau* as a result of MRP’s redesign and the resource consent to the *Te Rere Hau* extension. He concludes that, from his assessment, the cumulative impact of the two wind farms will be subtle. While existing wind turbines within *Te Rere Hau* lie to the north of the Pahiatua Aokautere Road, the proposed wind turbines associated within *Turitea* will be located closer to the Pahiatua Track. And while both the *Te Rere Hau* extension and *Turitea* will be visible from some viewpoints, especially at the crest of the hill on the Pahiatua Aokautere Road, in Mr Wyatt’s opinion this is not a significant change. For the *Turitea* wind turbines will be visible at the crown of the hill and appear to be a dominant element in the experience of a driver crossing the ranges at this point. Mr Wyatt was not called to be questioned at the resumed hearing after the redesign. But Mr Brown included in his opening statement on the redesign the following opinion:

Although both wind farms would be exposed to the valley corridor north and south of Pahiatua, the sequence of hills around the Mangahao River effectively divide this catchment into a number of lesser sized pockets. The *Turitea* proposal would therefore be viewed from within one sub-catchment south of Pahiatua, as well as near Makomako, Inglis and Nikau Roads, whereas the *Te Rere Hau*

¹⁷⁴ Applying this premise, he found that the main ridgeline from the existing *Te Apiti* wind farm through to Marima on the *Turitea* main ridge was the appropriate window. We have already discussed this under Groups D and E above.

¹⁷⁵ Bray, EIC paras 95–97.

proposal would mainly be viewed from a quite discreet sub-catchment around Ballance and Ballance Valley Road.

The overlap between these two sub-catchments would occur near the confluence of Ballance Valley Road and Makomako Road. More dynamically, the wind farms would be viewed consecutively as one travels either along Ballance Valley Road and/or towards Pahiatua-Aokautere Road on Makomako Road near Matarua Creek. However, I do not consider that this “overlap” between the two wind farms gives rise to any significant or unacceptable cumulative effects.

[243] In addition, because over 40 turbine zones were originally proposed by MRP in the vicinity of the South Range Road ridgeline, Mr Brown considers there would have to be a massive reduction in that number – more so near Pahiatua Aokautere Road – before the two wind farms would be wholly or appreciably divorced from one another visually. He concludes that, in effect, the potential to significantly reduce the cumulative effects associated with both proposals is quite restricted. In his opinion, he also does not consider that any reduction of cumulative effects is necessary or required.¹⁷⁶

[244] In cross-examination, Mr Brown was questioned as to how he regarded the extent of views to *Te Rere Hau* from the Pahiatua Track and South Range Road. He responded that the terrain is very dissected, varying from being quite exposed to it being completely screened. But the viewers from those locations would be looking in quite different directions from exposure to *Turitea* at the same time. Mr Brown, however, accepted that from RVP23 *Harrison Hill Road Looking east through to southeast* there will be a number of locations in this community from which *Te Rere Hau* would be seen.¹⁷⁷ In relation to RVP23 specifically, Mr Brown considers that Mr Bray had significantly overstated the level of potential cumulative effects from this location. The *Te Rere Hau* turbines visible from this quarter would ‘have quite limited impact on its overall character and the value of individual views’. Although jointly visible, both wind farms would tend to be seen in differing quadrants.

[245] Mr Anstey was also critical that Mr Brown considered the redesign proposal makes little difference in terms of *Turitea*’s cumulative effects with *Te Rere Hau* (including the proposed extension).¹⁷⁸ Mr Brown, however, reiterates that he had made it clear that he thinks any such effects will be acceptable, particularly given the very limited area, from Makomako Road, approaching Pahiatua Aokautere Road, from which both developments would be visible.¹⁷⁹ Mr Brown therefore disputes that Mr Anstey can claim that both the *Turitea* and *Te Rere Hau* turbines will register as overlapping rows of frenetic activity.¹⁸⁰ In Mr Brown’s opinion this greatly overstates the position. He considers that only turbine zones 101 and 102 might be seen to achieve this effect – when approaching the Pahiatua Track along Makomako Road. Viewed from

¹⁷⁶ Brown, SS, paras 9–10.

¹⁷⁷ Ibid, NOE 3005.

¹⁷⁸ Anstey, NOE 3178.

¹⁷⁹ Brown, OS, Resumed Hearing, para 20.

¹⁸⁰ Ibid, OS, Resumed Hearing, para 32.

further south and east again, the two wind farms would either read as separate entities or, as is commonly the case, closer to Pahiatua itself, and would be entirely screened from view.¹⁸¹

[246] Mr Bray agrees with Mr Brown's conclusion that the redesigned proposal is not sufficient to achieve any greater separation from the *Te Rere Hau* extension project. In fact Mr Bray does not consider this is necessary because 'any further spacing between these projects is likely to increase the perceived spread of wind farms across the Tararua landform as a whole'.¹⁸²

[247] The Board had some concern about what appeared to be the simplicity of Mr Wyatt's analysis and the numeric/visibility approach it appeared to embody. For example, just because turbines are visible in a scene, it does not mean that additional turbines can necessarily be added without cumulative effects. Additionally, we do not accept what appeared to be the notion that because motorists will travel through areas from which wind turbines are currently visible, this prevents an additional wind farm (*Turitea*) having sequential cumulative effects.¹⁸³ Also, Mr Wyatt appeared to give little analysis of landscape character and the effects an additional wind farm will have on this in terms of simultaneous and sequential views.

[248] Mr Wyatt refers to a cumulative assessment of the wind farms of Palmerston North as more of a 'social construct'.

You do not make your entire perception of Palmerston North or the Manawatu Plain from a fixed point (giving as an example VP1 *Kingsgate Hotel*) – you make it as you travel through these roads and that is one of the viewpoints you build up – the mental map of the area – your understanding of the landscape as you move through this area – it is a visible assessment rather than a cognitive one. You build up pictures in your head and you are aware of the wind farms that do exist. Palmerston North is, therefore, 'part of a rural wind energy landscape'.¹⁸⁴

[249] There are several issues arising from this statement. With *Motorimu* out of the landscape frame adjacent to *Turitea*, only part of the Manawatu could be termed a rural wind energy landscape and that currently is the hilly rural land north of the Pahiatua Track, not Palmerston North itself.

[250] It is our clear impression from listening to Mr Anstey and most of the submitters particularly, that the residents of Palmerston North who care about landscapes and visual amenity effects issues, have created their social constructs by building a mental map from the areas through which they travel the roads to the extent that their perceptions appear to be that the *Turitea* site and its environs is a significant amenity landscape – as described by all the experts – not an energy one. Theirs is indeed a cognitive one built up of natural elements – the

¹⁸¹ Brown, paras 20–21.

¹⁸² Bray, SS para 31, Resumed Hearing.

¹⁸³ Wyatt, EIC para 12.11

¹⁸⁴ Ibid, NOE 1434–1436.

pastoral lands, the reserve in the background, the large pine forests and pasture lands, including (for a few) their own working landscapes with shelter belts, gardens, small farm buildings and the like, as well as the newer well-cared-for lifestyle blocks.

[251] The intrusive unnatural features here will be the large energy structures down at the end of some viewshafts and across ridgelines, whether travelling either by car, horse, bike or on foot.

[252] And, from a public viewpoint, we consider there will be a serious disconnect between the design layout of *Te Rere Hau* and *Turitea* – the latter with its larger, more sculptured dimensions, and the ‘distinctive utility appearance’ of the former at significantly greater density. But this disconnect is likely to be more visible from out on the plains than closer to the foothills communities.

[253] While Mr Brown indicated that he has taken into account the cumulative effects of the *Te Rere Hau* extension in locations around Harrison Hill, it is the cumulative effect with the existing *Te Rere Hau* wind farm that is the key concern to Mr Bray. He believes more could have been done in the redesign process to reduce the potential cumulative amenity effects on Harrison Hill and the Pahiatua Track residents. But Mr Brown states that it is only at the top of the Pahiatua Track that you see both *Te Rere Hau* and *Turitea* cumulatively.

Finding on Cumulative Effects

[254] As the view of *Te Rere Hau* and *Turitea* from Pahiatua Track is likely to be a brief one, and cumulatively prominent/dominant for only a short period when travelling, we do not consider that the accumulation here is unacceptable.

[255] On Makomako Road both wind farms will be seen consecutively, but in their own small catchments. We do not consider that accumulation here is unacceptable either.

[256] In terms of effects from Harrison Hill, these are partially addressed by removal of the Bryant Hill (West) group, while the cumulative visual effect of *Te Rere Hau* and *Turitea* for residents is not unacceptable due to the different quadrants that the two wind farms occupy.

[257] But we agree, even after the redesign, effects of the collective wind farms with the addition of *Turitea* will have an adverse cumulative effect from the Manawatu Plains. From there, we agree with Ms Lucas, Messrs Anstey and Bray the addition of *Turitea* would have an adverse cumulative effect. From most viewpoints whether the wind farms are viewed successively or simultaneously they would present as extensive coverage of a significant natural landform.

Amenity/Landscape Effects on Foothlope Communities

[258] Before moving on to consider the remaining turbine groups, as well as revisiting Groups D and E and F and H, it is appropriate here to provide an overview of the amenity landscape effects on the foothlope communities.

Turitea in the Context of Rural Residential Development

[259] Ms Lucas' attachment 16 *Wyatt VP01 Kingsgate Hotel right of half of Turitea turbines* illustrates by numbers the turbines that are moving down the ridgelines towards the residential communities in the foothills/footslopes around the *Turitea* site. As noted at the beginning of this chapter, Mr Brown captures what people in those communities who brought their concerns to the Board feel about their environment and how they consider it will be impacted upon if *Turitea* proceeds.

[260] But in late 2005–2006, when he first began assessing the landscape effects of MRP's proposal, Mr Brown acknowledged that it was difficult for him to gain full appreciation of the extent of rural residential development that was unfolding around Ngahere Park and Pacific Drive at that time.¹⁸⁵ And, in fact, he acknowledges he did not look at the current proposal in any detail until 2008. In answering a question as to how the sparse residential development in 2006 compared with where it is now, he recognises that:

It's a bit of a two-edged sword, because on one hand you seem to have a strategy or the council appears to have a strategy of pushing more development close to the ranges and actually onto the foothills of the ranges, which inevitably means that there's a certain tension between that development and the type of proposal that is being looked at presently.

But the other thing of course what happens is that that very same development alters the landscape, alters its character, alters its values and ... reinforces the transition into a cultural landscape as opposed to a more natural landscape.¹⁸⁶

[261] Counsel for PNCC identifies that rural residential subdivisions in the foothills close to Palmerston North have been actively encouraged by the district plan since notification in 1994 in response to the public's demand to enjoy the amenity of those areas close to Palmerston North. He submitted that that encouragement has occurred without the plan provisions being challenged by rural landowners. The consequence is that they have accepted the encroachment of this development and the consequence of that is that this becomes part of the receiving environment against which the effects of any activities requiring a discretionary consent is assessed. In other words, it could equally be said that rural landowners, if they did not want the reverse sensitivity issues created by the increasing lifestyle dimensions of the foothills, should have

¹⁸⁵ Brown, NOE 1463.

¹⁸⁶ Ibid, NOE 1476.

ensured the largely rural production character was maintained (by not permitting subdivision down to 1 hectare).¹⁸⁷

[262] But Mr Love, the landowner of the land on which the Group H turbines are located, had earlier said this:

From the sales history of our district it is evident that over the last 19 years the Council had the opportunity to secure the future of the foothills landscape from further development, but did not. If the foothills landscape were truly looked upon as being pristine, and therefore worthy of protection from any further development, why was the land zoned rural residential, and why did the District Plan include a clear signal that such things as quarries, sawmills and wind farms could be considered? As we have pointed out, in our case the land was cheap. At very little overall cost to the ratepayers, the Council could have been the purchaser of our land, instead of ourselves, and resold it with necessary caveats, or retired it.¹⁸⁸

[263] We continually asked ourselves this question because the extremely varied topography of the site, with rural residential properties nestled in the valleys or prominently displayed on footslopes, causes difficulties for MRP's intention to place turbines close to residents in numerous locations and equally causes amenity difficulties for some of the residents who may live close to turbines. In using the word 'close' we recognise there are many interpretations of how close is too close – 1.5 kilometres (usually dominant) in this environment – or 1.5–3.5 kilometres (visually evident and potentially dominant). Mr Anstey, in relation to Mr Wyatt's vegetation screening plan for the residential properties most adversely affected by visual intrusion of the turbines on the foothills, noted that Mr Wyatt had indicated that in Mr Wyatt's country of origin (Australia) turbines were usually not located on elevated ground so they were somewhat easier to mitigate with fast-growing species.¹⁸⁹

[264] The Board recognises and endorses the financial/farming reasons why the landowners of marginal hill country seek turbines on their properties. *Te Apiti* is an example of an excellent design layout on, and use of, pastoral land. But we have been concerned throughout about the concern the closest rural residential landowners feel about this project – a disquiet which we consider goes much deeper than just the NIMBY¹⁹⁰ syndrome. Most of the submitters we heard from are genuinely disturbed at the prospect of having turbines so close to them – because there are so many they will become a visually significant intrusion in their lives and are therefore unacceptable. As Mr Wyatt identified in his supplementary evidence on the redesign 'Close residential properties will be impacted, especially when their owners are within that group who finds wind turbines unattractive and unacceptable'.¹⁹¹ As Mr Pollock points out, the PNCC

¹⁸⁷ Maassen, PNCC Closing Submission, para 32.

¹⁸⁸ #683 Love Submission.

¹⁸⁹ Anstey, NOE 1512.

¹⁹⁰ NIMBY refers to "not in my backyard"

¹⁹¹ Wyatt, SE para 8.6, Resumed Hearing.

District Plan makes few concessions to the protection of the amenities of the rural residential landowners.¹⁹²

[265] The PNCC District Plan identifies wind farms as ‘industrial structures’ in the Rural Zone¹⁹³ and, however the term ‘wind farms’ is addressed by public perception studies or turbine fields are described with qualifiers such as ‘beautiful’ or ‘striking’, there is no avoiding the fact that the Turitea wind farm is a very large industrial facility made up of:

- 104 turbines after the redesign, with associated roading and an equal number of large concrete foundations reinforced with steel which will remain permanently in the ground;
- up to 20 lattice structure towers up to 56 metres high for the transmission lines;
- a geographic spread of turbines and transmission towers over a plan area of around 45 kilometres;²
- two substations each covering an area of about 350 metres by 200 metres.

[266] Mr Wyatt considered ‘The wind farm site would undoubtedly be described as lying within an area of high amenity value’ and observes that this proposition generally accords with the views of Messrs Brown, Anstey and Bray.¹⁹⁴ He further endorses this description by identifying in his supplementary rebuttal evidence that the ‘Turitea Reserve in particular, has high visual amenity and is at the very least a high amenity landscape’ but ‘the area of the foothills outside the Turitea Reserve is [also] a high amenity landscape’. Once again, however, he qualifies these very clear statements with another opinion that development is acceptable because ‘this view is based on community perception studies which show that the majority of people would support the construction of the Turitea wind farm’.¹⁹⁵

[267] In spite of Mr Wyatt’s opinion, we have a well-founded concern from the evidence and from our site visits that the expansive nature of the Turitea wind farm development despite its linear layout – over the reserve lands and flowing down the high amenity landscapes of the foothills – is on a collision course with the communities who value that landscape and its visual amenities. Mr Wyatt provides some insight into this in a debate as to whether Mr Bray can say that ‘the foothills create a natural boundary to urban development’ and that the area between Bryant Hill and Pahiatua Aokautere Road ‘is valued for its simple rural character that contrasts strongly with the more developed plains and Pacific Drive Terrace’. Mr Wyatt responded as follows:

This claimed division between the foothills and urban development is not correct. Pacific Drive is not on a terrace of the Manawatu River,

¹⁹² Pollock, NOE 3808.

¹⁹³ PNCC District Plan, Para 9.9 Rules: Discretionary Activities (unrestricted): R9.9.2 Sawmills, Rural Industries and Wind Farms. *Explanation* 9-27.

¹⁹⁴ Wyatt, SRS para 2.13; Wyatt, RE para 5.10.

¹⁹⁵ Ibid, RE para 2, citing LS and VA section 6.7.

but rather is a continuation of a low ridge that extends in a north westerly direction from the Ranges. Bryant Hill is a local high point on the same ridge on which the Pacific Drive residential subdivision has occurred.

This is clearly shown on Figure 4 below. The foothills in this section do not create a “natural boundary” to urban development. In fact, recent urban development has occurred *in* these foothills, including the Pacific Drive and Polson Hill Drive examples that are apparent in the 3D view. The existing Pacific Drive development is planned to extend closer to both the Ranges and Bryant Hill along the same ridge.¹⁹⁶

[268] Mr Wyatt’s Figure 4 is revealing. It discloses the march to the foothills/slopes of the range by rural residential subdivision and development both along Pacific Drive and Polson Hill Drive. Mr Wyatt confirms this when he explains the existing Pacific Drive development ‘is planned to extend even closer to both the ranges and Bryant Hill’. And this is clear also from Mr Green, a submitter,¹⁹⁷ who affirms that there are numerous sections around Pacific Heights for development, although as Mr Pollock points out many of these have not yet acquired resource consent and the *Hawthorn* principles apply.¹⁹⁸ Nevertheless, Mr Wyatt thus confirms rather than alleviates our concerns about the gradual merging of communities and energy activities. We also heard from Mr Love that he and Ngawai Farms Limited (Mr Waters) had consent to subdivide some areas of their farms in the *Turitea* area down to 1-hectare rural residential lots.

[269] Mr Brown in his detailed observations of the significance of landscape to communities in relation to the examples of rural development discussed by Mr Wyatt says this:

... even though the landscape and amenity value of the wider ranges have undoubtedly been compromised to some degree by recent rural-residential development at Ngahere Park and around the Pahiatua Track, that same development has, if anything, reinforced the amenity ‘significance’ of the reserve lands around the Turitea Wind Farm site. In particular, the northern end of the Tararua ranges has significance with respect to new residential communities’ experience of visiting, living and recreating within the western margins and foothills of the Tararua Ranges ...

Whereas the focus for discussion of amenity values might otherwise have been directed towards the experience of either travelling through and past the Tararua Ranges, or viewing them from Palmerston North, Feilding, Ashhurst, Pahiatua and other areas of significant settlement, this recent development means that potential effects upon this physical quarter become potentially more significant.¹⁹⁹

¹⁹⁶ Wyatt RE, paras 3.28 and 3.30.

¹⁹⁷ #344 Green: Redesign #586 Submissions.

¹⁹⁸ Pollock, BECA Planning Expert Report, pp6–7.

¹⁹⁹ Brown, EIC paras 57–58, cited with approval by Anstey: see Anstey, EIC para 28.

[270] In his submission, Mr Green, a property developer whose group of companies is the largest privately owned development/investment company in Palmerston North, identified the issue he had with MRP's proposal. In the year 2000 one of his companies owned 88 hectares of rural land running parallel with Turitea Road. In 2003/2004 the bulk of this land was rezoned residential and rural residential. It adjoins residentially zoned land in Pacific Drive and rural/residentially zoned land in Valley Views Road and Turitea Road. Mr Green told us the area has been highly successful for new housing, partly because it has great views from most of the sections over the mountains and Tararua Ranges on a clear day, and over Palmerston North City as well.

[271] But the rezoning of the Green company lands had conditions placed upon them to avoid the visual impact on the surrounding landscapes and skyline from any structures and earthworks from built development above a certain height. Houses in that rezoned land are restricted to 6 metres in height on certain parts of the sections so they will not impact views of the skyline from houses in Turitea Valley. The land between those restricted height limits on the houses and the top of the ridge is also restricted to have no structures or facilities such as a fence, tennis court and so on above a certain height either.²⁰⁰ Clearly, if the wind farm goes ahead on the rural land adjacent with 125-metre high turbines, this would be inconsistent with PNCC's present policy for the Green's residential development nearby (although at the time of this hearing we do not know if Mr Green's company has applied for and obtained resource consents which are discretionary in this area).

[272] Mrs Harker, a submitter from Kahuterawa Road, attached to her first submission a revealing Beca map of the location of where she lives in relation to the project. While this in itself was helpful we were interested in the number of rural residential subdivisions which exist around the wind farm. We acknowledge some of these belong to the landowners and other supporters of the proposal but it was significantly illustrative of how peri-urban development is moving into the foothills/slopes of the Tararua Ranges.²⁰¹ Mr Brown acknowledges that the wind farm and residential development on the eastern side of the river in 2006, at the time of his first report to MRP, was hardly apparent.²⁰² In acknowledging a strong spatial relationship between Palmerston North and the Tararua Ranges, he states the significance of these landscapes may well have been reinforced, from an amenity point of view, from the patterns of development in the foothills. We consider this indeed to be the case.

[273] Mr Anstey adds to this observation by questioning whether the turbines proposed can be absorbed into foothill locations without compromising the amenity values of the residents and other users of the area. In his opinion, these locations are highly visible from many viewpoints and the development will not be set 'within' the already developed environment, but rather 'beyond' or at the back of what has already been intensely developed. He considers the ranges in

²⁰⁰ #344 Mid City Holdings Ltd, #586 Palmerston North Industrial and Residential Developments Ltd, Submissions.

²⁰¹ #579 Harker, Submission. Initial Hearing.

²⁰² Brown, NOE 1463.

the foothills are currently seen and valued as the natural backdrop to the developed plains.²⁰³

[274] We further heard from Ms Lucas that PNCC's strategic planning effort:

... involves encouraging expansion of the built city across the Manawatu River toward the Tararua range to avoid the Class 1 soils and flood-prone lands in other directions e.g., Summer hill shopping centre, Aokautere, educational complexes and Pacific Drive. From within new residential areas, such as Pacific Heights where I understand there are some 700 further sections to sell, there are clear views to the proposed turbines. Mr Wyatt shows an example from Pacific Drive, RVP2, 3 km from the closest of many turbines. RVP22a, RVP22b and RVP22c indicate a plethora of turbines, as close as 2.17 km.²⁰⁴

[275] Mr Anstey also lists many community locations which he considers will be adversely affected by the wind farm, many of which have, as yet, a considerable number of undeveloped lots. It is to some of the existing more particular private viewpoints we now turn.

Finding

[276] We find the location of turbines from this proposal on the footslopes of the Tararua Range is encroaching on the peri-urban development advancing from below and compromises the amenity values of the residents.

Residential Viewpoints and Micro-Siting

[277] In discussing the 'amenity values' of MRP's proposed wind farm site (as defined in s2 RMA), Mr Brown identifies these may range in scope right down in outlook to a single hill, ridge, stand of trees and so on. He identifies 'character' as that which is glued together by a certain cohesion and unity of elements to become pleasant and for having cultural or recreational appeal.²⁰⁵ A 'sense of place' and that which is 'distinctive' are elements of this. The amenity landscapes are thus those where such characteristics and physical elements are prominent and/or typical. Human modification may be readily apparent but will integrate reasonably harmoniously with the natural landscape patterns and structures evident.

[278] Many of the potentially affected resident submitters who appeared in this case reflected Mr Brown's opinion in their approach to how the wind farm would disrupt their visual amenity values. Many submitters, with rural residential properties on the footslopes, demonstrated how their developments had already integrated harmoniously with the landscape patterns and low-key farm structures

²⁰³ Anstey, EIC para 4.

²⁰⁴ Lucas, EIC para 132.

²⁰⁵ Brown, EIC para 36.

currently evident. For many, being on the footslopes of the Tararua Ranges, their amenity landscapes came from outlooks over hills, the ranges/ridgelines and surrounding rural properties composed of pastoral hills and plantation forests/wood lots both essentially natural in their presentation.

[279] For residential viewpoints, Mr Wyatt assumed:

- an occupant of a residential property will have a high degree of sensitivity to change in the surrounding landscape;
- viewer numbers for residential properties are not applicable;
- residents may be able to see the wind turbines as they move around their properties but the selected location for his assessment was the one most used (ie, a patio);
- landscaping may mitigate the visual impact of the turbines in many locations.

[280] Mr Wyatt gave an assessment of the number of houses he established were within 1.84 kilometres and those that were within 1.85–3.5 kilometres. They totalled 545. Other experts provided somewhat differing numbers but, whatever the number, Mr Wyatt's figures demonstrate they indicate a large number of houses within 3.5 kilometres.

[281] Mr Wyatt then commented:

The greatest potential impact is on neighbouring non-participatory residential properties.

Residential viewpoints have been selected that are either indicative of the range of views from a group of residences, or on the basis of being a residence with a significant potential visual impact ...²⁰⁶

[282] Mr Wyatt's residential viewpoints are taken only from one location and show the view from that location; the reality is that people can dramatically change the view by moving a few metres to the left or right and, as these are lifestyle properties, owners are likely to be moving around their properties rather than looking from one fixed point.

[283] Mr Bray was asked how many of the 283 private residences he had visited within 3 kilometres would have a view of the turbines. Mr Bray's response around the Group A turbines was that generally these turbines in those locations are going to be dominant²⁰⁷ but not including every turbine in the entire group. We noted earlier both Messrs Anstey and Bray spent a considerable amount of time visiting sites within the foothill communities affected by the wind farm based initially on the areas presented by Mr Wyatt in his photomontages. Mr Bray states he had visited hundreds of viewpoints within a 2 kilometre radius which he rated as the most sensitive amenity areas of the turbines ('occasionally finding a locked

²⁰⁶ Wyatt, EIC paras11.4–11.5.

²⁰⁷ Bray, NOE 2051–2052.

gate’).²⁰⁸ In explaining how he came to his conclusions that the *Turitea* wind turbines should be limited to the spine of the Tararua Ranges, the witness said this:

I could have gone through and given you an individual turbine, you know how significant it is and I chose not to because I thought actually most of this area is, I believe, about the major, major scale [of the wind farm] and whether and how much of this will go ahead altogether.

And I guess all I can say is I do feel sorry for those people, I would not want to be those people and so yes, there is a balance that has to effect ... I felt that generally weighing everything up the whole assessment together, that [what] I put forward was okay.²⁰⁹

[284] In an interchange with counsel for the landowners, Mr Brown acknowledged the high amenity value of the *Turitea* landscape and its foothills, despite the modification that has occurred on the foothill periphery.²¹⁰ He acknowledged this is a difficult area from which to make landscape assessments – to compartmentalise – and that there are always areas of transition – that this is a very grey area for landscape architects to evaluate.

[285] Mr Brown, we consider fairly, describes what is happening now in the foothills:

And what is actually happening is that the foothills are actually becoming at present more modified. Because there is certainly more rural residential development going onto them. But I can also see them becoming more vegetated over time as a result of that because people will start to put up boundary planting. There will be amenity planting. They will want to define their own areas, their own spaces.

So the landscape in many respects could become more attractive but it will be more of a cultural – it will be a very cultural landscape.²¹¹

[286] How close the foothills areas are to becoming cultural landscapes is demonstrated by the draft subdivision map included in Mr Green’s evidence as a submitter to the proposal.

[287] Mr Bray identifies in his evidence the areas of community interest we wish to focus on here. The foothills minor landscape units of Bryant Hill, Ngahere slopes above the Ngahere Park forest and Te Mata are seen as forming a dominant rural backdrop to residential and productive development. He mapped these areas as significant landscapes because they project that quality in their contrast to the productive plains. They are also seen as significant in contributing to the dominance of the Tararua Ranges in the wider landscape appearing as almost separate in that landscape. He suggests turbines on these lower landscape units

²⁰⁸ Bray, NOE 2110.

²⁰⁹ Ibid, NOE 2086.

²¹⁰ Brown, NOE 1469.

²¹¹ Ibid, 1484.

would be a doubling up of the apparent density of the wind farm, the effect being a greater saturation of the wind farm development in this location.²¹²

[288] Mr Wyatt specifies in his supplementary evidence on the redesign refinement process the factors he and Mr Brown considered important to implement were to:

- reduce the visual complexity/overlapping of the wind turbines;
- remove some turbines from foreground ridges;
- reduce the scale dominance of some turbines allowing landscape features to dominate;
- remove turbines from identifiable landscape features;
- reduce cumulative effects.²¹³

Effects of Redesign on Residential Viewpoints and Micro-Siting

[289] In relation to the redesign, Mr Wyatt starts from the position that, because of the linear topography involved (topography deeply incised by ravines, very different from the rolling pastoral hills and knobs of *Te Apiti*), it was very hard to modify the *Turitea* turbine layout. As a result, Mr Brown indicates in his further evidence that he only considered relocation or removal of problematic turbines rather than consider the new wind farm layout as a new entity. We considered that to be the correct approach because had MRP contemplated a new entity (as Mr Bray and many submitters appear to suggest it should have) it would have had significant legal implications for the company.

[290] We now turn to the areas which PNCC and the TAG and FOTR expert landscape witnesses consider the most affected by the redesign.

[291] Mr Brown went to the areas about which he had the greatest concern from a visual/landscape perspective in the redesign. The B Group (Bryant Hill (East)) turbines made up of WT72–WT73, WT82–WT89, WT90–WT92 and WT94 were deleted in their entirety. They were closely associated with the 1 kilometre contour – either within it or just outside. From all the evidence, we consider the removal of the B Group turbines has had a significant positive effect on residential amenities – and that was acknowledged by Messrs Bray and Anstey. MRP is to be commended for the result.

[292] In addition, under MRP's redesign, the Group H turbines were modified, with the deletion of WT122–WT125 as the most dominant at the southern end. The rest of the Group H turbines remain. Again, we consider the removal of these turbines had a significant positive effect on residential amenities, and MRP is to be commended for the result. We comment at the end of this chapter on MRP's (and Mr Love's) later requests to reinstate and relocate WT122–WT124.

²¹² Bray, EIC para 75.

²¹³ Brown, NOE 2990.

[293] The Group A (Bryant Hill (West)) turbines WT74–WT78 remain after the redesign, some within the 2 kilometre range of residential properties.

[294] The Group C (Pahiatua Track) turbines WT67–WT69, WT70–WT71 and WT95–WT96 remain, some within a 1 kilometre range of residential properties, with WT94 deleted.

[295] The Group K (Love Ridge) turbines WT127–WT129, WT130–WT131, WT134–WT136 and WT54 also remain with four within a 1.5 kilometre range of residences, but with WT132–WT133 removed.

[296] In his supplementary evidence Mr Brown discussed the difficulties with the redesign:

It is very difficult to achieve appreciably more positive outcomes without making major changes to the entire project. I must also acknowledge that it is very difficult to have pared back one layer of turbines and go back and remove successive layers that still appear prominent.

This is particularly true in relation to views of the proposed wind farm from around 126 Pacific Drive (RVP02) 406 Pahiatua Aokautere Road (RVP03) Polson Hill Road (RVP 25) and south of Aokautere Road (VP04) in which the removal of some dominant turbines has still left others in a dominant/prominent position.

However, I am satisfied that the most dominant/prominent zones about which I was concerned have been removed.²¹⁴

[297] The qualification of ‘most dominant’ as opposed to ‘dominant/prominent’ was a qualification which Mr Anstey picked up, affirming for him that some of the remaining turbines in these locations were still dominant. Mr Brown, however, considered Mr Anstey was confusing visibility with dominance/prominence in these areas. But we understand Mr Anstey was referring back to his original evidence where he had visited each one of Mr Wyatt’s photomontage locations and made his own broader assessments of properties in the same streets, noting at Pacific Drive, for example, Mr Wyatt’s Figures 40–41 are very representative of views from a number of houses along that road. Mr Wyatt assesses the visual effects there as more than minor and adverse. At a viewing distance of 3 kilometres, the turbines would be ‘very dominant’.²¹⁵

[298] In any analysis of effects in this hearing, ‘dominance’ we understand from Mr Wyatt’s evidence, denotes significant adverse effects. Counsel for MRP enforces this understanding when he submits that Mr Brown’s focus was on the effects he thought ‘particularly problematic’ and he did this against the tests of

²¹⁴ Brown, SE para 24, Resumed Hearing; see also Anstey, NOE 3148–3150.

²¹⁵ Anstey, EIC para 71. See also Wyatt, EIC paras 11.23–11.30.

visual prominence/dominance imposed on specific features and so on. ‘The acid test’ he submits ‘is evaluation of his revision’.²¹⁶

[299] Thus, if Mr Brown focused on the ‘most dominant/prominent’ turbines, and even ‘most overly dominant’ in the redesign then we concluded close evaluation needs to be made of the visual dominance of the remaining ones. Mr Bray had already identified some turbines at 3 kilometres as ‘dominant’.

Groups D and E: Makomako Road Private Viewpoint Perspective and After the Redesign

[300] Earlier in this chapter we considered the effects on Makomako Road from a public viewpoint perspective. We now return to the same location to consider the effects of the wind farm from a private viewpoint perspective following the redesign.

[301] There are two private properties which are affected by the domination of the turbines across the ranges in this location. The first is 933 Makomako Road, an older rural residential lifestyle dwelling set in an old garden full of beautiful trees. And in this rural setting is also located the colonial villa of the Percy family at 789 Makomako Road, which has been recently restored. Wyatt, RVP17 *Makomako Road 2.2km northwest of the nearest wind turbine (WT106)*, indicates the Percy property has an extensive garden planted around the residence and intersects of plantation forest in front of their view of approximately 21 turbines, some of them tips.

[302] Mr Wyatt’s evidence before the redesign indicated the living areas of the Percy family faces away from the proposed wind farm site and even views from within the garden area are very limited. In his Table 23: ‘Summary Assessment’ of his evidence-in-chief, Mr Wyatt gives an evaluation rating of the dominant landscape unit and sensitivity as ‘high’ for residential living in this location, with nil for ‘no’ living/courtyard views towards the wind turbines, and visual evidence as ‘high’ also. He considered there is no adverse effect from the living area but a more than an adverse effect from the garden. Mr Wyatt considered that any adverse views could be screened out by planting mitigation.

[303] Meanwhile *Public Viewpoint 2 Makomako north of Inglis Road* of Mr Brown’s earlier assessment (closer to the Percy family than the Mangahao River) has even slightly stronger impact ratings than it did for his first viewpoint 2.

[304] Mr Low, President of TAG, which was formed to maintain the existing benefits and characteristics of the land for future generations, in an oral interpolation at the end of his submission on 6 August 2009 referred to the people affected on Makomako Road, and stated that one of the reasons TAG opposed the whole project was because of its effects on this group.²¹⁷

²¹⁶ Davidson, MRP Closing Submissions, para 20.

²¹⁷ #301 Low, Submission.

[305] The Board visited the Percy property and also heard a presentation by Mrs Percy at the inquiry. On our site visit we first of all spent some time addressing the overall impact of the turbines on the ridgeline as seen in Wyatt RVP17, 933 *Makomako Road, looking west through to the north*. We also addressed Figures 93 and 94 of Mr Wyatt's evidence-in-chief and the questioning of Mr Wyatt by Mrs Percy.²¹⁸ We also visited 933 Makomako Road. There was no one at home in this location, but we were able to see the potential impact *Turitea* would have on the back working landscape of this property. As noted under Public Viewpoints earlier, the changes in the turbines in this location are subtle but they still remain dominant.

[306] At 789 Makomako Road Mr Wyatt suggested using open canopy or deciduous trees in the back garden to screen the turbines from what turned out to be the expansive views of the turbines from the large open-plan living area consisting of dining room, kitchen and living room within the house and other windows that face directly north west. In an oral interpolation to his evidence when discussing the view of the turbines from this location Mr Wyatt referred to the turbines as 'massing along that view'.

[307] Our concerns for the Percy family at 789 Makomako Road therefore did not change. Looking north they have little relief from dominant turbines. Looking south, however, they are more prominent rather than dominant on a receding basis.

[308] We do not consider the original planting plan or any plan as outlined by Mr Wyatt would screen the views of the turbines from that location at all adequately. First, it would bring trees closer to the house which already experiences shadow effects from large existing trees on the adjoining fence line even in January (the New Zealand summer). Second, the ridges with high turbines on top are too high to sustain any mitigation planting at all because of the way the family appear to move around that property. And third, we took note of Mr Brown's entirely negative response to a question from Mr Love as to whether he had used planting as a mitigation tool when involved with previous wind farms. By his reply, Mr Brown effectively endorsed what two different divisions of the Environment Court have now held about mitigation planting in such rugged terrain, made up of ridges, valleys and foothills such as this in *Project West Wind* and *Motorimu*.

[309] In his supplementary evidence concerning the redesign, Mr Wyatt provided a graph depicting large and small improvements in two shades of green. For RVP19 933 *Makomako Road*, his graph indicates a small improvement with the nearest wind turbine (WT103) at 1.4 kilometres. But he omitted to include an assessment of RVP17 789 *Makomako Road* at all, the residence we consider to be very adversely affected.

[310] Putting to one side whether some of the back ridge turbines on *Turitea* should be removed because they are located on an ONL and ONF, we consider that taking out all turbines on the back ridge of the Tararua Ranges should not be the remedy for the Percy family. As Mr Brown states, one can reach the situation

²¹⁸ Wyatt, NOE, 1343.

where you ask ‘is the wind farm as a whole overly dominant in which case you remove it’. But in this case, three experts (Messrs Bray, Anstey and Baker) acting for those approving some limited development acknowledge there should be some on the ranges and we understand they will also provide some balance to and coherence with the wind farms to the north.²¹⁹ We are guided by that evidence in part alongside the evidence of Messrs Wyatt and Brown.

[311] But in the case of the Percy family, who have carefully restored an historic Wairarapa villa within its curtilage, they remain confronted by a large number of turbines on the ridgeline, with minimum mitigation. We consider the situation from 789 Makomako Road is one where MRP could contemplate some form of compensation and that, if resource consent is finally granted, discussions to this end should take place as soon as possible.

Finding on Group D and E Makomako Road from Private Viewpoint Perspective and Following the Redesign

[312] In our Draft Report we noted that the effect of the turbines on the Percy family in Makomako Road was significant and needed addressing by MRP. We comment further on MRP’s response to the Percy family when we discuss MRP’s response to the Draft Report at the end of this chapter.

[313] Our understanding of 933 Makomako Road, at the time of writing the Draft Report, was that this property was leased and we had no input from anyone otherwise speaking for this property except Mr Wyatt, who as we observe above, noted ‘a small improvement’ in this location with the redesign. As a result of the comments on the Draft Report process we now realise that the submissions of the McBride family who live at this address were overlooked. How this occurred when in fact the Board is in receipt of four submissions from them is unknown.²²⁰

[314] In fact, Mr and Mrs McBride, who had made submissions on the first proposal had been living in the Waikato attending university there and were anticipating return to live at number 933 at the end of 2010.

[315] The McBrides state they are 200 metres from the proposed wind farm boundary and they have two residences, one the main house and a smaller cottage which has been renovated and used as a bed and breakfast. Thus their concerns arise from the fact that they are not only residents but also tourist operators. Not only are they very close to the turbines at 1.4 kilometres but they have recently been advised that a pylon and transmission line route might well be located on their very southern boundary.

[316] What may be done to alleviate the impact of the turbines along the western Tararua ridgeline on the McBrides, given our findings earlier around the adverse effects of the project on the neighbouring Percy family?

²¹⁹ Bray, EIC paras 83–93. Anstey, NOE 3213.

²²⁰ #168 and 169 McBride, Submission on Revised Layout.

[317] We have little doubt that the McBrides will be very adversely affected by the proximity of the turbines along the ridgeline and how the transmission tower might affect them.

[318] The NPSREG now provides for compensation to owners where this is warranted and we consider if MRP's facilities are to remain that the family, like the Percy's before them, should receive compensation from MRP because there is no way the landscape and visual amenity effects can be mitigated.²²¹

Groups F and H from Private Viewpoint Perspective and After the Redesign

[319] Before the redesign, Mr Wyatt provided impact assessments of some of the turbines in Groups F and H and, in particular, several locations affected by Group H from a private viewpoint perspective.

[320] They include RVP8 *Opposite 48 Kahuterawa Road* which is approximately 4.9 kilometres north west of the nearest turbine, WT125. This location has residences at a lower elevation in the valley to the left and one on a hill to the right which looks onto another hill. Mr Wyatt considers there will be only minor effects in this location as a pine plantation currently provides screening for the residence on the hill and where there is no screening, distance and intervening dramatic landforms provide effective mitigation for the others.

[321] RVP9 *Opposite 434 Tennant Drive* is approximately 6 kilometres north west of the nearest turbine, WT125. Mr Wyatt's conclusion for RVP9 is that there will only be a minor effect from this viewpoint because of the distance factor, although the turbines are potentially noticeable in areas such as this with no intervening topography or vegetation.

[322] RVP10 *297 Kahuterawa Road* is approximately 2.6 kilometres from the nearest turbine, WT125. Mr Wyatt observes that from RVP10 the closest visible wind turbines could dominate the landscape and consequently there would be a significant effect from this location. He recommends mitigation planting here.

[323] RVP15 *291 Kahuterawa Road* is also approximately 2.4 kilometres northwest of the nearest turbine, WT125. Mr Wyatt's conclusion for RVP15 is that some of the wind turbines in this location will be visible through the existing vegetation. But because of both vegetation screening and the distance from the turbines the impact they will create will have a minor effect.

[324] RVP16 *Greens Road* illustrates a residence 1.2 kilometres away from WT132. But this is part of Group K turbines and we address it under that grouping. Most of the turbines here will have significant effects, but Mr Wyatt considers additional planting in the garden and possible growth of existing trees will mitigate these.

[325] RV20 *24 Greens Road* is approximately 1.2 kilometres north west of WT125. For RVP20, Mr Wyatt suggests that the distance factor makes the

²²¹ See paras 313–326 of Chapter 13 of the Draft Report.

turbines highly visible from the garden but that upon maturity, the existing cypress windrow will effectively screen this view.

[326] Similarly, for RVP21 *Kahuterawa Road*, 1.6 kilometres away from the nearest turbine WT125, a number of turbines are proposed on the ridge behind the house in that location. While the effects are significant, landscape mitigation through screen planting would reduce the effects to minor.

[327] Mr Anstey observes that, from several of these viewpoints, vegetation might mitigate the impact of the turbines but views would be sacrificed.

[328] He describes the outer end of Kahuterawa Road as having expansive views of the foothills and ranges, but that the views narrow as the foothills come closer. It is his opinion that the proposed Group H turbines on the Love property would dominate the long ridges and high terraces from north to south across these views.²²²

[329] Mr Anstey further identifies that there are many houses and properties in the Kahuterawa Valley foothills that have open and expansive views of the high front ridges and terraces. For example, three sites on Lacebark Drive, a new subdivision 2 kilometres from the proposed turbines, have spectacular views as well as views of several turbines on the foothills.

[330] Mr Bray, in summary, considers the Group H turbines have somewhat limited effects on visual amenity (although have a much greater effect as part of the overall group of turbines at the southern end of the wind farm). However, the tight clustering of the turbines and the main angle of view towards them from Pacific Drive means that blade crossover of turbines in this location will have a significant adverse effect.²²³

[331] One of Mr Love's criticisms of MRP after the redesign was that, in some sections, there are illogical gaps on the landscape which tend to destroy its cohesion and harmony. And while respecting the concerns of the residents with the views represented in RVP20 *Greens Road* and RVP21 *Kahuterawa Road*, he states that they relate to the views of only two families who objected to the wind farm in the first place and that in the redesign process Mr Brown did not take into account local support for the project.

[332] Meanwhile, Mr Love saw Mr Anstey's wider concerns about the turbine effects on Kahuterawa and Greens Roads as not warranted because they in fact provide very few opportunities for the public to see WT122–WT125 in full view. And indeed the turbines would arguably add interest to the landscape as fleeting glimpses only are otherwise available.

[333] There were numerous submitters from the Kahuterawa Valley who felt affected by the intrusion of the turbines into their lifestyles. Some were more affected than others.

²²² Anstey, EIC para 89.

²²³ Bray, EIC paras 220–224.

[334] The four turbines, WT125–WT122, that Mr Anstey identified during questioning as extremely intrusive of residential communities were removed by Mr Brown in the redesign.²²⁴ In his supplementary statement after the redesign Mr Anstey argues that the turbines on the Love property in Group H still dominate the view from most of Kahuterawa Road.²²⁵ And in the Appendix attached to his supplementary evidence he notes that, in RVP10 *297 Kahuterawa Road*, the northern-most visible turbine is WT128 (sic) 2.4 kilometres away, with 15 other turbines visible in this view altogether.²²⁶

[335] We consider on the photomontage evidence provided, that MRP's approach was appropriate in the circumstances where the turbines were dominant. In particular, we noted the approval of Mr and Mrs Pugmire as among those most affected who are pleased with removal of the most troublesome turbines. We also note that the Lacebark Drive houses identified by Mr Anstey as being adversely affected are approximately 3 kilometres away and likely to have more prominent/dominant views. And we further note in Mr Anstey's Appendix that there is no WT128 in Group H – it remains in Group K while WT55 has already been taken out, as have WT132–WT133 from Group K.²²⁷

[336] We note in this regard that gaps created in the wind farm landscapes can destroy its cohesion and harmony but do not consider this is what occurs here. This is an issue we address when we consider Bryant Hill (West).

[337] We conclude the removal of WT122–WT125 has a very positive impact on the views of the residents in Greens and Kahuterawa Roads. The restoration of their views from this location can be seen by comparing RVP20 *Greens Road* with RVP21 and RVP22(a) *Greens Road* in the relevant redesign photomontage.

[338] Mr Love, in defending the case for retention of deleted turbines to be located on his land, considered the offending turbines in the location of RVP21 would be in the background not the middle ground.²²⁸ Mr Brown reiterates that they are 'well and truly' in the middle distance even though the only feature behind them at 1.6 kilometres distance is the sky. Nevertheless he states:

In this instance the turbines would appear to sit on top of that key ridgeline which defines this catchment ... this is also a view that also catches part of the landscape around Turitea and has considerable appeal ... I felt that the turbines proposed would sort of loom over this part of the catchment ... they would have a dominating effect.²²⁹

[339] We note, however, that Mr Love for all the landowners, identified that the deletion of four turbine zones, WT122–WT125, from his property on the basis of dominance from various viewpoints, represents a generating capacity of

²²⁴ Anstey, NOE 3142.

²²⁵ Ibid, SS para 11.

²²⁶ Ibid, SS Appendix p8.

²²⁷ Ibid, SS Appendix p8.

²²⁸ Brown, NOE 3104.

²²⁹ Ibid, NOE 3105.

12 megawatts which is enough power for 4,000 houses. From his family's knowledge of the local topographic, geographical and wind energy issues in this area, they are extremely confident that if the four turbine zones in question could be recessed back 200–300 metres, this would result in two on the outer edge of Browns Flat and one near the substation on their land. The recessing would put the turbine zones as far back as WT52 while the turbine zone near the substation would be on flat land. While appearing slightly closer to the viewpoints identified it would appear more recessed, although the transmission line as a result would have to be shifted slightly.

[340] MRP makes no submission in response to Mr Love's evidence. We have not enough clear evidence to respond either, noting that Browns Flat was previously regarded by MRP as a sensitive environment – as does the Board. (See further comment on this issue at the end of this chapter on the revised layout MRP suggested in its comments on the Draft Report.)

Finding on Groups F and H from Private Viewpoint Perspective and After the Redesign

[341] We concluded that the removal of WT122–WT125 has resulted in a very positive impact of the views for the residents of Greens Road and Kahuterawa Road and, with no evidence to respond to Mr Love's suggestion for relocating those turbines, accept MRP's redesign for Groups F and H.

The Remaining Turbine Groups K, A and C

Group K (Love Ridge)²³⁰

[342] Mr Anstey describes Kahuterawa Valley as having a very distinctive character – the road weaves its way between low hills, crossing gentle saddles and traversing small streams. Trees and fences define ordered patterns of settlement and enclosure, with older houses buried in trees and new ones standing unadorned on low hills and ridges.

[343] The witness identifies the Group K turbines on Love Ridge as visible to the south of Ngahere Park – at least where there are no pine trees blocking the view. In his opinion, the turbines would be clearly 'overwhelmingly dominant' in this view – with no mitigation available.

[344] Before the redesign, Mr Bray considers the effects of the Group K turbines on Love Ridge the most dominant of all the turbines at the southern end of the wind farm. He describes the turbines as running in a lineal ridgeline from the dominant peak Tirohanga (522 metres) to the boundary with the forest flanking the upper Turitea Valley. Based on the Beca population map, it is his understanding there are 78 residences within 3 kilometres of this group of turbines. With the forest within the Turitea catchment located on the unseen side

²³⁰ Mr Love made the point that, while Love Ridge appears to be called after the Love family, it is actually owned by others.

of this ridgeline from the plains, the turbines therefore would be located in an area which has predominantly a pastoral character.

[345] Mr Bray identifies that from some locations, such as the lower part of Kahuterawa Road, the actual ridgeline on which the turbines are to be located is screened by a smaller one that runs parallel, hiding the northern end of Greens Road. While the foreground landscape view from the identified affected properties is relatively complex, with a mix of exotic and native trees scattered around the dwellings and through the valley, the ridgeline extending up the Turitea catchment has a clean, simple pastoral character. It is dominating in this location rising 200 metres above the viewer. The turbines are to be located on top of the ridge and therefore have a significant ‘bearing down’ effect on the observer. Here, the term ‘clean, simple pastoral character’ creates certain difficulties for landscape issues relating to the location of turbines. Mr Bray said this:

Landscape experts commonly refer to the ‘*visual absorption capacity*’ of a landscape. Complex landscapes that have many folds or valleys and large pockets of variable vegetation tend to have higher capacity to absorb turbines, as they become just another landscape element.

Simple landforms with clear legible skylines and open pastoral character tend to have less absorption capacity, and turbines would become dominant elements of the view. As such they are likely to generate greater adverse visual effects.²³¹

Such is the case with the Love Ridge turbines.

[346] In particular, Mr Bray singles out RVP16 *Greens Road*, where 335 Greens Road is adversely affected – which at 1.2 kilometres to the nearest turbine is located at the base of a gully. The property at 336 Greens Road is 100 metres closer to the turbines, with clear views from the living room and outdoor areas up to the dominating ridgeline. The property located at 307 Ngahere Park Road, Mr Bray also identifies as having an expansive, elevated vista across the plains to the Group K turbines which would become significant elements in the view from this property, located as it is at 2 kilometres from WT130.

[347] Before the redesign, therefore, Mr Bray concluded that the adverse effects on visual amenity from this group of turbines on these residences, and from views from part of Greens Road, would be significant. He says similar visibility of the turbines in this group would occur from Huatau Marae where they would be a prominent backdrop element in this location.²³²

[348] After the redesign, Mr Baker affirmed for PNCC ‘a lot of the most objectionable turbines were removed’. He considered what MRP had done is ‘fantastic in that respect of just taking away the most adverse turbines’. But then he went on to say that the logic that went into that redesign could apply to many more turbines coming out for the same reasons. About Love Ridge he says this:

²³¹ Bray EIC, para 134.

²³² Ibid, EIC paras 206–214.

And I guess, trying to draw an example of that is looking at John Love's ridge there, what's interesting here is in my map two they've deleted turbine 133 and 132 presumably for landscape visual amenity reasons, however those turbines are the lowest turbines. Turbines from thereon in step up that ridge which as you can see over my shoulder is highly prominent so I felt that if one was taking off those two turbines, how on earth did they sort of draw the line there and not go further? So I figured that it must have been something around trying to ensure a suitable level of viability overall. I still really struggle with that group in particular, but it's fair to say, and I don't want to be here all day, but it's fair to say that I had the same sort of concerns with the remnant group A which just seemed odd.²³³

[349] What Mr Brown achieved through the redesign is removal in Group K of turbine zones WT132–WT133 and the relocation of turbine zones WT127–WT131 and WT134–WT136 north of Browns Flat. This, he considers, has reduced encroachment on the 'middle distance' ridge they follow. Mr Brown considers that 'from most perspectives the relocation (of the identified turbines) has pushed them into the gap created by the loss of the turbine zones WT132–WT133 without obvious gains in reduced visual presence'.²³⁴ His conclusion is that removing the Group K turbines would have a much lesser level of intrusion than, for example, Bryant Hill (East), and that there is little to be gained by further removing WT127–WT131. He does not accept that the turbines on Love Ridge now dominate the view of most of Kahuterawa Road. While the turbines are visible, the removal and repositioning of those turbines means they are much less so than they were. 'To be dominant, a turbine must change the character of the landscape and offset the quality of the environment in an adverse sense'; it must be more than just 'visible' which is what he considers Mr Anstey is alleging after the redesign.²³⁵

[350] Mr Brown explained he did not visit individual viewpoints but that he did revisit the evidence from the first part of the hearing (which included the photomontages), including the submissions of the residents, and one part of his focus was dominant hills and knobs. He agreed that communities tend to interact more closely with the physical resources that are closest to them, and he accepted that assessing landscape is very much about associations; he agreed further that highly valued landscapes can contribute to people's wellbeing.²³⁶

[351] RVP16 *Greens Road* in that regard (before the redesign) demonstrates the K Group as a series of highly dominant turbines when viewed from that residential location. We were not given an updated photomontage of RVP16 but even revisiting the original photomontage we see that removing WT133–WT132 would lessen the visual impact of those two turbines but it left the rest in a still dominant and intrusive position.

²³³ Baker, NOE 3981.

²³⁴ Brown, SS para 22, Resumed Hearing.

²³⁵ Ibid, OS 2010, paras 14 and 16.

²³⁶ Ibid, NOE 1465–1466.

[352] We sought to identify the locations of WT127–WT133, WT134–WT136 and WT54 in relation to residential viewpoints from the evidence of the MRP witnesses. VP4 *Turitea Road South of Aokautere Road Looking south* (Amended Layout) identified WT133 as the nearest turbine 6 kilometres away, but over concern under this heading with the turbines on Love Ridge which is a foreground ridge, we also looked at RVP8 *Kahuterawa Road Looking southeast* with the nearest turbine WT125 (removed in the redesign) 4–9 kilometres south. This illustrates the Love Ridge WT127–WT9, WT134–WT136 and WT56 as more prominent in the view (WT55 was already removed for cultural reasons).

[353] RVP14 *307 Ngahere Park Road Looking south* showed the nearest visible turbine (WT130) at 2 kilometres south. WT130 is shown behind pine trees as are WT127–WT129 and WT134–WT136, while WT54 is isolated out on its own below the top of Love Ridge. If the plantations are removed these turbines will be dominant in this location. Meanwhile the nearest turbine (WT132) in that location, 1.9 kilometres south east, was taken out in the redesign.

[354] RVP21 and RVP20 *291 Kahuterawa Road Looking southeast through to southwest* showed the Love Ridge series turbines again, this time seen as more recessive. The more dominant turbines seen from this viewpoint were taken out in the redesign. These in fact were WT122–WT125 of Group H. Mr Anstey acknowledges there is a significant improvement from that viewpoint from the removal of those turbines.²³⁷

[355] RV10 *297 Kahuterawa Road Looking southeast through to west* shows the distance to the nearest turbine (WT125) as 2.3 kilometres. While WT123–WT125, the most dominant of Group H in this sequence, have been taken out, the Love Ridge turbines still remain.

[356] Mr Anstey acknowledged to counsel for MRP in cross-examination and to Mr Love in questioning that Mr Brown's redesign in the area of Kahuterawa Road and Greens Road had meant:

- the turbines with the most local dominating effect were removed – in their impact on Kahuterawa and Greens Roads including the Kahuterawa Reserve;²³⁸
- the remainder in large numbers dominate the view in the wider landscape as you move towards the hills along Kahuterawa Road; then there will be glimpse views;²³⁹
- in the valley proper the turbines are high on the hill above the road and where the road runs close to the hill, the turbines would not be seen;
- the Greens Road residents and the houses on the corner with Kahuterawa Road have very direct views of the Group K turbines.²⁴⁰

²³⁷ Anstey, NOE 3164.

²³⁸ Ibid, NOE 3173.

²³⁹ Ibid, NOE 3174.

²⁴⁰ Ibid, NOE 3175.

[357] We consider that there may be some confusion between the mitigation of the Group H turbines on the Love property and the Group K turbines on Love Ridge. Counsel for MRP (referring to the Pugmire letter) and Mr Love appear to have a focus on Group H turbines, which are on the Love property. Mr Anstey acknowledges a significant improvement in that location with the deletion of the turbines. He is firm in his view, however, that the Group K turbines on Love Ridge remain dominant, but conceded there would be glimpse views. The broad landscape is seen from the top of the Kahuterawa Road, with 100 metres of view opposite the Dansfield's property, with views again at the Greens Road turnoff, and then again at the top of Greens Road 'over the hill'.

[358] Of the submitters Mr and Mrs Perera, of 31 Oram Drive, identify the Bryant Hill remaining turbines as the closest. VP4 *Turitea Road South of Aokautere Road* indicates their general location in relation to the wind farm and Figure 3 in their submission illustrates specifically the location of where they live. VP4 illustrates the Love Ridge turbines edging close to the residents and it also illustrates some of the other residential properties looking directly at the turbines.²⁴¹ We note, nevertheless, a number of the turbines in the Perera's Figure 2 have now been removed.

[359] Some Pineland Drive residents are impacted upon by the K Group turbines. Mrs King, of 20 Pineland Drive, identifies WT127–WT131 as potentially affecting her family and identifies the redesign does not address their concerns (nine turbines remaining within 2.4 kilometres of both Bryant Hill and Love Ridge).²⁴²

[360] Mr and Mrs Cooper, of Turitea Road, illustrate with Figures 2 and 3 photomontages that WT127–WT134 will dominate the ridgeline in that location (as will WT74–WT78 on Bryant Hill (west)), most of which are within 1.5 kilometres – they are estimated to be within 3.5 kilometres of their dwelling.²⁴³ Mr and Mrs Rosa, of 354 Turitea Road, request the deletion (among others) of WT54, WT127–WT135 of Group K, which they consider will significantly impact on their view of the reserve.²⁴⁴

[361] We paid a special site visit to the area affected by Group K towards the end of writing this report, giving particular attention from the road to the residences in Greens Road, Lacebark Drive, Kahuterawa Road, Ngahere Park Road and Pineland Drive, all locations which were identified by the experts. Many of the viewpoints we selected illustrated houses in these locations set into well-planted landscapes with outward views to Love Ridge obstructed by a thick pine plantation which on plan map appeared to be owned by individual owners, so they are in control of their own landscapes. The age of the plantations indicate they may have another 15 years of life before requiring to be cut down. And then we compared what we had seen with RVP10 297 *Kahuterawa Road* from which WT122–WT125 of Group H had been deleted. We agreed with Mr Brown that from this vantage point the Group K turbines that can be seen are not dominant,

²⁴¹ #450 Submission.

²⁴² #89 Submission.

²⁴³ #580 Submission.

²⁴⁴ #385 Submission.

though they will be prominent and possibly dominant when new dwellings (if they were already consented) go in on the subdivision roading seen in the foreground of this photomontage. But again, we are unaware whether resource consents have been granted for dwellings here or not.

[362] An issue, however, lies with 335 Greens Road shown in RVP16 *Greens Road Looking south east through to south*. WT132–WT133 have been deleted from that viewpoint, but it still leaves WT127–WT131 dominant in the view and the remaining WT136 prominent. Neighbouring 336 Greens Road has macrocarpa planting that lies between the house at 335 Greens Road and the Love Ridge turbines. However, even at its full height in many years to come the hedge will leave the turbines very dominant in this position. The property at 336 Greens Road is closer to the turbines again and has a clear view from the living room and outdoor areas of the house up to the dominating ridgeline containing the group, but this property belongs to one of the landowners on whose property the turbines would be located. We were also advised during the hearing the submitters at 335 Greens Road had supplanted their submission with a s94(2) approval for the wind farm to go ahead.²⁴⁵ There remains the Adams' property at 24 Greens Road where the turbines will be located to the periphery of their property, although not within sight of the Huatau Marae.

[363] There are adverse effects from Ngahere Park Road, however. It is located at the same elevation as Love Ridge. While it is located in an area of pine plantations, there are numerous houses located within them that have outward views, particularly on upper Ngahere Park Road directly towards Love Ridge. Those turbines Mr Bray considers:

... have both effects on the local amenity but they also have more macro effects, so when you look from further afield those turbines are lower on the foothills and I do not believe they should be located on this part of the ranges. The houses built in upper Ngahere Park Road were built with that view in mind. So they do play a big part in my assessment.²⁴⁶

[364] Part of the significance of the location of the Love Ridge turbines is most appreciated from more distant views where they appear to be encroaching on residential properties below – see VP4 *Turitea Road South of Aokautere Road*²⁴⁷ and VP6 *Aokautere Drive* (Amended Layout). When the surrounding pine plantations are removed the turbines will stand starkly on the ridgeline unable to attract any mitigation.

[365] Our focus in this regard became Mr Brown's response to Mr Love (through MRP's counsel) when Mr Love asked him to respond as to why he had taken out WT132–WT133 of Group K from Love Ridge:

Firstly, they were identified as being prominent to dominant from a range of viewpoints and on the ground vantage points, including

²⁴⁵ Davidson, NOE 1355, letter to the Board, 27 July 2009.

²⁴⁶ Bray, NOE 3273–4.

²⁴⁷ Anstey, NOE 1514.

public viewpoints 4, 6, 11 together with residential viewpoints 2, 7, 16 and 22. The consistent manner in which these turbines were identified as being prominent to dominant was regarded as exceptional compared with other turbine zones comprising part of the Turitea project. Moreover, in some specific views around Aokautere Road and Turitea Road it was considered that turbines 132 and 133 would intrude into views of the main water catchment and its bush area viewed above and beyond the main catchment dam.

Although the level of intrusion would not be inordinate in itself the combined impact on the natural values of the water catchment and forest area caused by this imposition, together with awareness of their location on a middle ground ridge, as opposed to the more remote ridgeline around South Range Road, was of concern.²⁴⁸

[366] As a result, Mr Brown concluded that it was the accumulated effects associated with WT132 and WT133 that led to their deletion from the revised wind farm proposal rather than any single impact in relation to one or more individual viewpoints.

Finding on Group K

[367] We empathise with Mr Brown's description, acknowledging that it applies to both public views (discussed earlier) *and* private views. We differ from him, however, in the extent of turbine removal necessary to mitigate the effects he identifies.

[368] In Chapter 12 of this report we have found the majority of the Turitea Reserve an ONL, contiguous with the ONL of Hardings Park and Tararua Forest Park. Located within the *Turitea* ONL are the ONF of the skyline, Back Ridge and Game Ridge. Group K in almost its entirety will have an adverse effect on these. It breaches the ONF of the skyline and Game Ridge *and* adversely affects the natural character and amenity values of views into the Turitea Reserve. Here is what Mr Anstey says about the integrity of the skyline and effects from the wind farm:

From a landscape perspective it is generally accepted that the integrity of the skyline or, backing up a bit, the skyline is always prominent. So in broad terms any edge is prominent. Where there is a significant change in land to sky is obviously a very significant edge. So people intuitively focus on edges and that land/sky edge is the focus of people's attention. So the skyline has greater or lesser value attributed according to all the stuff that is in the evidence. That skyline has coherence because its nature is similar along its whole length, so the coherence is the integrity and a sense of continuum, that is coherence.²⁴⁹

²⁴⁸ Memorandum, Counsel for MRP 24 March 2010, paras 32–35; see also NOE 3854–5.

²⁴⁹ Anstey, NOE 3187.

[369] We also recall Mr Brown's assessment of the ridge, where he comments on 'the mantle of native forest along the crest of the range and the sense of naturalness and integrity associated with the main ridge sequence', which Brown refers to as being a signature feature in relation to the local communities.

[370] He also states: 'To be dominant, a turbine must change the character of the landscape and offset the quality of the environment in an adverse sense'; it must be more than just 'visible'.²⁵⁰ In our view, the Love Ridge turbines meet this definition of dominance.

[371] We conclude that, for visual amenity reasons, the Group K turbines WT127–WT131, WT134–WT136 should be deleted.

[372] WT56 reads from the west as part of the Group K turbines and should be deleted for the same reasons as discussed above. WT54 reads from the west as part of Group G and can remain.

Group A – Bryant Hill (West)

[373] Mr Bray gives the clearest overall description of Bryant Hill (East and West) in his evidence-in-chief. The following is a summary of what he says:

- Bryant Hill is a dominant foreground landform visible from a large local catchment;
- this group of turbines is the most significantly dominant in the windfarm in terms of visual amenity;
- the turbines are located on the western slopes of the Bryant Hill foothill at elevations of 260–373 metres; the main peak of Bryant Hill is at the end point to a low ridgeline that runs in a north west direction from the upper Turitea Valley; because Bryant Hill itself is so dominant, turbines on this landform are visible in most of the western side photomontages he reviewed;
- he understands there are approximately 283 private residences within 3 kilometres of these turbines with the landform rising sharply from an elevated terrace at about 100 metres on which the Pacific Drive subdivision is located; further expansion of settlement on this terrace is being considered closer to Bryant Hill;
- apart from some forestry on the north face and the southern end adjacent to the Turitea catchment, the majority of Bryant Hill is managed pastorally presenting to the viewer a strongly bold rural character;
- from locations further away, such as VP1 *Kingsgate Hotel*, Bryant Hill is clearly discernable as a dominant foreground landform irrespective of the main ridges of the ranges which form the skyline in the viewpoint;

²⁵⁰ Brown, NOE 2997.

- Bryant Hill marks the start of the rural and undeveloped (in a built sense) landscape; as such it has high aesthetic value;
- the top of the Bryant Hill landform also creates the skyline screening of the main ridgelines of the ranges from view.²⁵¹

[374] Mr Wyatt describes the location of RV22 *Pacific Drive* as approximately 2.4 kilometres north west from the nearest wind turbine WT88 (which was taken out in the redesign from Bryant Hill (East)). He chose this location for the photomontage because it is one where potentially most exposed residences may be constructed along Pacific Drive in the future. The entire range is seen from this location and this is seen in Mr Wyatt's Figure 111 with *Te Rere Hau* on the left-hand side. Mr Wyatt's assessment is that given the proximity of the turbines to any further residential development the turbines will be visible but create a minor adverse effect if adequate house design and landscaping mitigation is put in place.²⁵² But it is Mr Bray's opinion that, whether the Group A turbines are retained or not, the low elevation of the B Group on the dominant foreground hills brings the turbines remarkably close to the urban boundary. In his opinion, the size of the turbines is too great for the scale of the foreground landscape on which they would be placed.²⁵³

[375] Mr Anstey describes Turitea Valley and Ngahere Park identifying that Turitea Road enters a valley with a very distinctive rural area with the straight section of the road at the entrance to the valley affording expansive views of the hills. The Bryant Hill (East) turbines he describes as being in the centre of the view 3 kilometres away. There are 97 dwellings in this valley and 23 undeveloped lots, while 50–60 houses have open views to the wind farm and there are 28 dwellings on Turitea and Harts Roads. The remainder are in Ngahere Park on sites above the valley floor.²⁵⁴

[376] After the redesign and the turbines on Bryant Hill (East) had been removed Mr Bray remained concerned about the potential effects of the remaining WT74–WT78 turbines, which appear as an isolated group and draw attention to themselves.

[377] Their significance in this foothill landform is also markedly different from the turbines seen on the main spine of the ranges. This is a distance problem. It is the perceived scale at which these turbines will be seen – they appear much bigger than the ones on the ridgeline significantly further back. They also sit below the skyline whereas the remainder sit above it and their connection to Bryant Hill is that they appear to come out of the back of it.²⁵⁵

[378] Mr Bray drew attention to RVP07 *Oram Drive* (Amended Layout) where the turbines in this location will remain dominating structures (although only the tip of WT78 is seen). RVP3 *Pahiatua Track* also clearly shows the separation of

²⁵¹ Bray, EIC paras 155–159, 165.

²⁵² Wyatt, EIC 11-198-11-208.

²⁵³ Bray, EIC para 175.

²⁵⁴ Anstey, EIC paras 80, 87.

²⁵⁵ Bray, NOE 3255–3258.

this group, as well as the original RVP25 *Polson Hill Drive* in which all five Bryant Hill turbines are also visible as a breakaway group. Although located behind the Bryant Hill ridgeline, Mr Bray finds these remaining turbines continue to affect the integrity of this landform, particularly from locations where the ridge forms the skyline.²⁵⁶

[379] Assessing this group in the wider landscape, Mr Bray uses VP1 *Kingsgate Hotel* to demonstrate that they collectively form a breakaway group from the rest of the turbines on the main ridgeline – they are seen significantly closer to the (public) view. At 8 kilometres he observes they are closer to the urban fringe than the main ridgeline at 11 kilometres.²⁵⁷ Before the redesign he considered both Groups A and B had effects on visual amenity that are more significant than the ridgeline groups. After the redesign, he considers that because the Group B turbines have been deleted from Bryant Hill it cannot be assumed that the turbines that remain (WT74–WT78) will be a less than minor effect in this location. He observes that dwellings in Ngahere Park, for example, are approximately 2 kilometres south west of the Group A turbines which are still dominant in this landscape.

[380] Mr Brown agreed that, in a physical sense, those remaining turbine zones (WT74–WT78) are effectively in a breakaway position from the rest of the turbines, but in terms of how they are perceived and viewed from a public viewpoint ‘there will still be a sense of connection/association with others’ that will ‘inevitably emerge visually in virtually every view from every viewpoint’, (with Group A linked to C, even though Group B has been deleted in its entirety, and extending right round to Group G, H and F). Mr Brown considered the distances from which this would occur are from Polson’s Hill Road and Harrison’s Hill – in other words – ‘a great distance’. ‘They would be part of the assemblage of turbines from up around South Range Road to the interface with Hardings Park.’ He maintains the turbines will be seen in a wide panorama and part of the same line of turbines as opposed to the more remote lines around South Range Road and Pahiatua Track.²⁵⁸

[381] Mr Anstey meanwhile sees the remaining turbines as having a slightly more uniform scale and a profile without quite the same form and projection of some of the deleted turbines in Group B.²⁵⁹ He identifies the same problem that Mr Brown had – if one row is removed, then the other row of turbines behind assumes its own dominance – it assumes greater significance. In his reply to the proposed refinements of the wind farm he concludes that, apart from limited locations, for him the significance of visual effects remains unchanged and he reaffirms his opinion that the turbines remaining will have serious and adverse effects on the foothills environment.

[382] Mr Anstey also gives evidence that there are four houses on Pineland Drive and all but one are high on the ridge and have similar views. When the pines are removed from the adjacent plantation, over 20 turbines will be visible.

²⁵⁶ Bray, SS paras 14–24.

²⁵⁷ Ibid, NOE 2052.

²⁵⁸ Brown, NOE 3065.

²⁵⁹ Anstey, NOE 3166.

RVP11 16 *Pineland Drive (Conservatory and Upper Flooris* approximately 1.5 kilometres east of the nearest WT78. We also considered RVP11 *Looking northeast to east* with labelled turbines WT74–WT78, which demonstrates turbines on the ridgeline with the others slightly back. Mr Wyatt was advised that the pine trees seen in his Figure 70 are going to be replaced with natives, but once the pines are removed the wind turbines will be highly visible in this location. Given the distance, he considers the turbines will have a significant effect. But with maturation of the native planting, however, the overall effect would be reduced. Nevertheless, we note the foreground trees are pines also and there is no guarantee they will remain and nor was there any assessment of the rate and height of growth of the native trees in this location.

[383] The landform is distinctly separated from the main ridgelines (which appear more elevated and distant, unlike the turbines around *Te Apiti*).

[384] Dr Huffman, one of the rural/residential submitter landowners that MRP classifies ‘as affected the most by the proposed amendments to the project’,²⁶⁰ gave a visual presentation of the relative size of WT74 as it dominates the top of Bryant Hill, 2 kilometres away from her family’s home. The submitter maintains it is not ‘merely visible’, but ‘highly visible and will dominate the landscape’. She makes the valid point that, for WT74 and the other ‘breakaway’ WT75, WT76, and WT77, there are no intervening ridges or other terrain to lessen the dominance of these turbines on this hill despite Mr Brown’s inference that there are positive mitigatory aspects to the redesign. While WT78 has been relocated 150 metres to the south/south east, and only the tip remains, WT74–WT77 have not been relocated at all.

[385] We endorse Mr Bray’s assessment that while RVP07 *Junction of Oram Road and Ngahere Park Road in Oram Road* (Amended Layout) demonstrates that turbines are no longer on the face of Bryant Hill, at least several turbines from this location would remain as dominating structures. Their removal in the redesign would have resulted in the other turbines only being visible on the main ridgelines – removed from what Mr Bray considers is ‘a distinct foreground landmark’.

[386] In relation to Bryant Hill (West), Mr Anstey still considers the effects are significantly adverse for a number of people in Ngahere Park Road and Aokautere Drive. He would ‘be very bothered by the effects of the removal of the pine plantation’.²⁶¹ He reiterates this is going to make the ranges a more prominent element in the environment for people living particularly in the Ngahere Park area.²⁶² We agree with that assessment of the various pine plantations scattered along the foothills – if they come out in the future they will leave residents visually very exposed to these turbines.

[387] In spite of some of the more problematic turbines on Bryant Hill being removed, the remainder occupy a significant stretch of landscape. Most of them

²⁶⁰ Submitters #317, #664, Presentation on redesign, para 11: citing Counsel for MRP, Submissions on Redesign 15 March 2010, para 3.1. See also NOE 3379.

²⁶¹ Anstey, NOE 3194.

²⁶² Ibid, 3197.

on a really clear day will register as being over the skyline. Mr Bray, while understanding Mr Brown's argument regarding the temptation to remove 'layers', remains very concerned about the potential effects of WT74–WT78 which now (even more so) appear to be an isolated group. The original RVP25 *Polson Hill Drive* shows all remaining Bryant Hill turbines as a breakaway group because:

- they have significant adverse effects on the landscape and maintain a dominating presence over nearby residential properties;
- they remain as dominating structures on the skyline, while removing them would have resulted in the wind farm only being visible on the main ridgelines;
- they continue to affect the integrity of the landform because they are perceptively larger in scale than those on the main ridgelines (some 2 kilometres away) and they dominate the rural simple character of this landform;²⁶³
- portions of turbines WT74–WT78 would be visible within 2 kilometres from locations on Turitea Road and parts of Ngahere Park Road.

[388] We were not as convinced as Mr Bray was concerning effects when they are considered in relation to RVP25, but are convinced by a review of RVP23(b) *Harrison Hill Road Looking south through to southwest*. This perhaps shows the clearest example of the inappropriateness of the Bryant Hill (West) turbines. This demonstrates three lone turbines on the hill looking isolated. The Huffman/Devey homestead has a direct line of site to these turbines, which would be very dominant.

Finding on Group A

[389] We note that, with the redesign, MRP removed a large number of the Group B Bryant Hill turbines that caused offence. On reviewing all the documents, submissions and photomontage examined by Mr Brown relating to this group, we endorse the evidence given by him and both Messrs Anstey and Bray that their removal has made a significant difference to visual amenity and landscape issues in the vicinity of the residents and the areas most affected in that location. MRP is to be commended for taking such a significant step to sustain this part of the foothills environment.

[390] But we have decided that, in addition to those turbines removed by MRP under the redesign, the remaining Group A Bryant Hill turbines should also be deleted.

Group C – Pahiatua Aokautere Track

[391] Mr Brown describes the landscape around the Pahiatua Track as follows:

²⁶³ This can be observed in reviewing the scale and location of turbines 74–78 in the original RVP22 photo simulation (Pacific Drive).

The landscape comprises a mix of open pasture, bare ridges and slopes, exotic woodlots, scrub, bush margins and rural residential blocks that – apart from the wind turbines of the Te Apiti and T3 wind farms in particular – display little real distinction, cohesion or memorability. They are not unique or (aside from the wind turbines) especially distinctive. They are, in effect, part of a wider working landscape.²⁶⁴

[392] In this location are the Group C turbines, WT70–WT71, WT67–WT69 and WT95–WT96. In Mr Brown’s original report (2006) to MRP, turbines WT95, WT70, WT69 from Group C were registered as ‘dominant’ in that landscape with an impact rating of ‘high to moderate’.²⁶⁵

[393] Mr Anstey makes the point that the Pahiatua Track is in large part contained by topography and vegetation, but that there would be significant views of the wind farm from the road at several locations. He considers there are 61 existing houses in the Pahiatua Track area within 3 kilometres of turbines and a further 31 lots for potential houses. These are mostly elevated, set up on ridges and terraces. He estimates 40 of the 60-odd houses would have views of the turbines. Most of these already have views north to those of *Te Rere Hau* and *Tararua*.

[394] Before the redesign, Mr Bray describes the Group C turbines (eight in number located just below the main ridgeline of the ranges, south of the Pahiatua Track) as marginally separated from the former Group B turbines by a small gully that runs up the foothill from a location near Harrison Hill Road, and they are at a slightly lower elevation, and further forward (west) than the turbines on the main ridgeline. Most turbines in this group would sit on a small terrace at about 400 metres, although WT71 is located slightly lower at approximately 320 metres.

[395] Mr Bray describes the land use in this location as predominantly pastoral with pockets of commercial pine forest on some lower elevations and south east of the main ridgeline of the ranges. Hence the landform for the C Group turbines is described as having a predominantly bold pastoral character as for Bryant Hill. Due to its undeveloped nature, Mr Bray considers this area as farming and is a significant part of the rural backdrop of the landscape.

[396] Before the redesign, Mr Bray considered that from residences on Pahiatua Track, Harrisons Hill and Polson Hill Drive, particularly as seen in RVP3 406 *Pahiatua Track*, approximately 1.1 kilometres north of the nearest turbine (WT92), this group of turbines would have similar effects to Group B, particularly in encapsulating the residences amongst the collective turbines of the proposal and *Te Rere Hau*. He notes that there are pine trees planted in the immediate foreground view from 406 Pahiatua Track, but it will be at least 10–15 years before these reach a height where some screening of the proposed turbines would be achieved.

²⁶⁴ Brown, EIC para 54-1.

²⁶⁵ Ibid, Exhibit 9 MRP *Preliminary Assessment of Landscape and Amenity Effects*, 2006, p27. Also NOE 3015.

[397] In his opinion, 26 turbines would sit in a significantly elevated position, and would dominate the 30 residences within 2–3 kilometres. Combined with Groups A and B, these turbines would add considerable complexity to an otherwise simple landscape unit and effectively bring the presence of the wind farm dramatically forward into the urban landscape. In his view, they would be the ‘nail in the coffin’ in terms of views from the ranges, which would no longer be ‘turbine free’.

[398] In relation to the redesign, turbine zones WT68 and WT71 from Group C were relocated over 100 metres, and turbine zones WT69 and WT70 relocated less than 100 metres near the upper part of Pahiatua Track. WT94, previously described by Mr Bray as a ‘dramatically tall beacon’ on the hill, was deleted as was WT92 being so close to the Kells’ property.²⁶⁶

[399] Mr Bray, after the redesign, states that on a site of this size, micro-siting of up to a couple of hundred metres is unlikely to have any significant impact on the effects of the development as a whole and consequently he does not consider the relocation of the turbines in Group C in the redesign has resulted in any significant reduction in the potential landscape or visual amenity effects of the project. While the removal of WT94 has made an appreciable difference to the proximity of turbines to houses on the Pahiatua Track and around Harrison Hill Road, the ‘layer’ effect described by him means the row of turbines WT68–WT71 and WT95 and, to a lesser extent WT67 and WT96, become the dominant ones and he believes there will still be houses within 2 kilometres of these structures. ‘Collectively they would be dominant, complex structures in an otherwise open rural landscape located to the southeast.’

[400] The location of the Group C turbines is in an area where part of the Pahiatua Track is more exposed to the wind farm than any other part of the Pahiatua Track – 500 metres away ‘as close as you can get to wind farm turbines’.²⁶⁷ In relation to this area, Mr Brown sees it as completely modified – either open pasture or pine forest – and that while he and Mr Wyatt accepted the turbines as being very, very prominent in that location, they felt that being that close ‘might actually be a quite dynamic and dramatic experience in a positive sense’. And although sensitivities in relation to proximity and relative elevation of the turbines were high, the actual landscape values were very low.²⁶⁸

[401] In his observations on the redesign, Mr Brown considered that it was not appropriate to remove all visible turbines in this location because then that would have massive implications for the proposal as a whole. He considers that while the remaining turbines are prominent in the sense they are clearly visible, they are not dominant. This is because other removals (such as the Group B turbines) have caused the turbines in this area as a whole to become much more recessive. In this location Mr Brown considers it is not just a question of ‘how visible the turbines are, it is the relationship they have with the vegetation, landform and so on. These turbines have a real feeling of proximity and closeness to the viewer’.

²⁶⁶ #682 Kells, Submission.

²⁶⁷ Brown, NOE 3015.

²⁶⁸ Ibid, 3016.

[402] As WT69 and WT70 were relocated less than 100 metres and WT95 not deleted or relocated at all, we consider that Mr Brown's original evidence stands – these particular turbines will remain dominant – certainly to the public viewer at 500 metres away from the nearest turbine. We acknowledge nevertheless they will provide a dramatic visual appearance to the traveller in this location.

[403] It is very clear from both the Grassicks' and the Stewarts' submissions and presentations to the Board over the Group C turbines, however, both before and after the redesign ('tucked in' as they are to a corner of the Pahiatua Track),²⁶⁹ that being so close to these turbines, even if they do not see them from their houses, will not be a dynamic and dramatic experience in a positive sense. Mr Brown indicated there is no hope that the turbines can be integrated or screened into the landscape at all in this location. The geography of the area defeats this.

[404] And, as earlier noted, Mr Brown made reference to his recommended 'golden mean' whereby wind turbines generally should have half the scale of the landforms on which they are located (or less) resulting in a 2/3 landform to 1/3 (turbine) scale relationship at worst – if they are to appear to avoid being overly and excessively dominant per se. None of the turbines in the Pahiatua Track–Harrison Hill area meet Mr Brown's recommended 'golden mean' as nearly all of these turbines on the ridges dominate this landscape according to the definition.

[405] Nevertheless, we consider the deletion of the Group B Bryant Hill (East) turbines has made a large contribution to lessening the effects of the turbines overall. And the deletion of the Group A Bryant Hill (West) turbines will lessen those effects even further. For Mr Bray said this:

From viewpoint RVP22 *Pacific Drive*, the landform on which these turbines would be located forms the skyline, although at approximately 6km from the viewer it is noticeably further distant than the Bryant Hill landform in the foreground. As a result, the turbines would be considerably less dominant than those in Groups A and B; however, they would remain perceived as part these groups. Even if Groups A and B were removed from the proposal, in my opinion the Group C turbines would have a moderate impact on the rural outlook view from this location.²⁷⁰

[406] The Grassick property, which is set below the turbines on the hill behind, is nevertheless within 1 kilometre of the turbines in this area. On our site visit (which was not undertaken by Mr Brown, although he is very familiar with the area) we noted that, while the frontage of the house overlooks several *Te Rere Hau* turbines, the rear of the Grassicks' property is adjacent to a knob on cleared farmland, the ridge of which will, we consider, carry an offending turbine – WT95 – which will dominate that part of the Grassicks' outdoor location. We assessed WT95 as dominant in the context of the Grassick property. It should be deleted.

²⁶⁹ #583 Grassick, Submission; #283 Stewart, Submission.

²⁷⁰ Bray, EIC para 178.

[407] We understand the Stewarts were more concerned about noise than dominant turbines from their location. We have already indicated noise will not have significant adverse effects, and the deletion of WT95 for dominance reasons will assist if noise has an effect.

Finding on Group C

[408] We have concluded that WT95 should be deleted from the Group C turbines.

Transmission Line along Back Ridge (South)

[409] It was not until the Draft Report was about to be released for publication that we confirmed from the site map on the Turitea wind farm website that MRP's proposed transmission line corridor from the Plantation substation was routed along Back Ridge (South), from about WT15 to WT23, before crossing the reserve to connect into Browns Flat substation.

[410] Whilst we acknowledged that an indicative corridor was shown on the Beca engineering drawings, unlike the turbines, there was no indication on these drawings as to the proposed locations of the individual transmission towers nor of their foundations. We also noted that the transmission line was not shown on the photomontages for the original design, that it was barely indicated on the photomontages for the redesign and was not addressed in any meaningful way by any of the landscape experts – although we noted that Mr Wyatt in his supplementary evidence referred to the transmission line on three of the photomontages.

[411] In our Draft Report, we had already decided to delete WT15 to WT29 and WT39 to WT43 on Back Ridge (South) as we found that these would be an inappropriate development and would not protect the ONF. For the same reason, we found that the proposed transmission line along Back Ridge (South) would also be an inappropriate development.

[412] MRP was therefore requested to provide us with an alternative route for this transmission line so that the ridgeline was protected in an equivalent manner to that which had resulted from the deletion of WT15 to WT29 and WT39 to WT43. In its response to the Draft Report, MRP identified a new transmission line route which has a lower elevation and shorter structures with these structures being located clear of the skyline where the line crosses the ridge. The Board has accepted this revised routing with this being detailed on the drawings attached to the approved Conditions of Consent.

Board Consideration of Comments on Draft Report

Introduction

[413] MRP, in its 'Comments' document, seeks the reinstatement of six turbines in their original locations that affect landscapes and visual amenity (an

additional three to the north of the wind farm site).²⁷¹ PNCC identifies these for clarity as:

- Group 1 three turbines creating a third tier when viewed from Palmerston North sitting approximately behind WT9–T103;
- Group 2 six turbines in approximate locations WT15–WT20;
- Group 3 three turbines in locations WT122–WT124.²⁷²

[414] For completeness and ease of reference we have considered MRP's proposed revised turbine layout in one consolidated section in this chapter of the report.

Submitters

[415] The resident submitters' responses to the MRP request to reinstate 12 turbines elucidated a range of views from 'nothing more than an effrontery' to 'providing an overwhelming presence of turbines' to 'an act of bad faith' and tellingly, 'the removal of these [Group 3] turbines by MRP (in the redesign) meant they were not assessed by other parties in relation to the redesign in the wind farm version upon which the Board based its draft decision'.²⁷³

[416] The landowner submitters were united in their opposition to the turbine deletions noted in the Draft Report, citing the benefits the turbines would bring nationally, regionally and locally and to the farming community involved.²⁷⁴

[417] Other submitters again introduced issues that the Board did not seek a response to in our Memorandum of 30 May 2011 (refer to the Memorandum in Appendix 3 of this report). These issues included the Waitakere Ranges Act 2008, reconfiguration of the Group C turbines, removal of the Browns Flat substation, noise.

Issues

[418] Through its proposed revised layout, MRP seeks to maximise the wind farm's benefits and better secure its ongoing viability and sustainability, within the scope of effects identified as being acceptable in the Draft Report. MRP considers this is an appropriate and responsible strategy, particularly given the:

- (a) importance of *Turitea* to Mighty River Power's wind programme;
- (b) quality of the wind resource at the site; and

²⁷¹ *Mighty River Power's Comments on the Draft Report of the Board* Section Three, paras 28–29, and Henry, SS Appendix 1 para 4.6(i).

²⁷² Maassen, Counsel for PNCC, *Palmerston North City Council's Response to the Board's Minute Dated 30 May 2011*.

²⁷³ See variously #537 Milne para 4.5(c)(ii); #92 Adams, T; #9 Huatau Marae; #686 Mildon, para 83.

²⁷⁴ #449 Poff, #592 Ngawai Farms Ltd, #683 John and Kathy Love.

- (c) continued central and local governments' policy and regulatory directives regarding renewable electricity generation;

Evidence and Discussion

[419] As to (a) – the importance of *Turitea* to MRP's wind farm programme – that remains an issue for MRP and not the Board. As to issue (b) we address that below in this chapter and we address issue (c) in Chapter 18.

[420] In *Project West Wind* the Environment Court issued a series of Interim Decisions to address with Meridian²⁷⁵ a number of problematic turbines. That was an Environment Court process. MRP pre-empted such a process here by introducing the redesign before the inquiry was completed. This intervention may have been because, when considering the Draft Report, the company perceived the legal difficulties inherent in the process set out in the RMA for call-ins, see s148(4) – and as set out in PNCC's Response to the Board's Memorandum dated 30 May 2011.²⁷⁶ The Board here has responded differently to PNCC's response because it seeks an end to litigation of this wind farm and the continuing impact of that litigation on the parties. We consider there was just enough legal leeway to do this given the provisions of ss148(4), 149 and 41 RMA and the wider definition of 'comments'²⁷⁷ that exist, rather than the more restricted view of MRP's stance taken by some of the submitters.

[421] In the event, MRP considers that its proposed revised layout would provide for a wind farm of 72 turbines with 42 in the northern area and 30 in the south.

Group 1 Turbines

[422] MRP seeks for its proposed turbine layout:

- a) the repositioning of three turbines largely within the envelope of the pre- and post-redesign of the northern area to create space for additional turbine zones;
- b) through infill, the inclusion of three additional turbine zones (WT104A, WT107A and WT10A) within the space created in the northern areas as a result of the repositioning mentioned above.

These infill turbines have been in part facilitated by upgrades in technology allowing turbines to be located closer together. MRP considers these alterations will not have any unacceptable effects on the surrounding environment.

²⁷⁵ *Meridian Energy Limited & Others v Wellington City Council and Wellington Regional Council* [Environment Court] W 031/2007, paras 453–581.

²⁷⁶ Maassen, Counsel for PNCC, *Palmerston North City Council's Response to the Board's Minute Dated 30 May 2011*.

²⁷⁷ See above Chapter 1.

Submitters

[423] PNCC, through its counsel, submits that the Group 1 turbines are not within scope because:

- (a) the locations of the Group 1 turbines are not close to any turbine zones proposed in the application; and
- (b) the locations are not in substitution for existing turbine zones in a particular location but an addition to those in an existing group; and
- (c) the turbines will create a third tier that may ‘impinge’ in whole or in part on the Tararua skyline recognised in the decision as an ONL/ONF causing potential clutter or visual dissonance effects unassessed and new; and
- (d) the turbines could cause potential adverse effects on the eastern side of the Tararua Ranges, closer to unknown properties together with cumulative adverse effects for the eastern viewing catchment that were not assessed.²⁷⁸

[424] Of the resident submitters, Mr and Mrs McBride, who live at 933 Makomako Road, provided the briefest and perhaps most telling response. They are ‘deeply aghast’ at the prospect of having the proposed turbines so close to their home.²⁷⁹ With the ‘Appendix 4 map not clear’ attached to Mr Henry’s statement, they estimate the nearest turbine will be 1.4 kilometres away from their property and feel they have been unfairly singled out. In their earlier comments on the Draft Report they have also identified a potential transmission tower that was not there before.²⁸⁰

[425] The Board considers the three northern turbines are within scope, that is, they are within the application boundaries.²⁸¹ But the *Turitea* project is not *Project West Wind*, where the Environment Court allowed Meridian to introduce several new turbines to replace those taken out by the Court. There, the Court was provided with Truescape photomontages which provided a much clearer indication of where the new turbines would be and which residents they might affect. This is not the case here.

[426] The question is whether the effects of the additional three Group 1 turbines, including visual effects and noise, are generally within the anticipated range of the cluster of turbines. For example, would three additional turbines within the visual simulation from a viewing point to the east say, Makomako or Balance Roads, introduce a measurable impact? Would there be a perceptible difference, or is the landscape already confined to becoming an energy production landscape such that three additional turbines would have little additional difference?

²⁷⁸ Maassen, Counsel for PNCC, *Palmerston North City Council’s Response to the Board’s Minute Dated 30 May 2011*, paras 8–10.

²⁷⁹ #168 and #169. *Comments on MRP’s Redesign*.

²⁸⁰ *Ibid.* *Comments on the Draft Report* p2, para 2.

²⁸¹ See *Estate Homes v Waitakere City Council* [2006] 2 NZLR, 619, para 106.

[427] Here, the three additional turbines are only mapped with no photomontages provided. And while in *Project West Wind* the Court considered the replacement turbines would not affect those in close proximity to the project, we are not at all clear that this is so for those who might be adversely affected on the eastern Tararua side of the project, particularly the McBrides and other residents who live there.²⁸² Those who may be affected would be denied the opportunity to participate if we followed MRP's suggested process on the papers.

[428] We note that MRP identifies the repositioning infill of the turbines in the northern area has the potential to increase the noise emissions from the site.²⁸³ With respect to these effects, Mr Henry is confident that these three additional turbines can be operated within the noise standard NZS6808:2010 and in compliance with the draft conditions of consent. But we were not provided with distances from houses to affirm this or given any other detail which might have been of assistance – just MRP's assertion. There is also an additional issue – what of this new technology which allows turbines of this height and strength to be brought closer together? What impacts might these have on avian issues, for example?

[429] We consider that, as Meridian did in *Project West Wind* (where the company had omitted consent for the transmission facilities to be located adjacent to the turbines), if MRP wishes to pursue its request for the three additional Group 1 turbines it has the opportunity to apply for a variation to the consents given in this Final Report. That opportunity is highlighted in PNCC's submission and is one we support, namely:

The draft decision provides a platform for seeking consent for additional turbine locations in the northern cluster such as Group 1 by way of additional consent and can be argued with supporting evidence at that time. The decision identifies suitable turbine locations and therefore is valuable to MRP in defining the scope of acceptable development but also to PNCC and the future provision for renewable energy which will remain relevant over the medium term.²⁸⁴

Group 2 Turbines WT15–WT20

[430] Mr Henry considers that the six turbines MRP is seeking to reinstate on Back Ridge would be some of the most efficient turbines in the wind farm layout, and that their retention would therefore be very important to the overall efficiency and economic viability of the wind farm as a whole. They are located on the flatter and wider part of the ridgeline.

²⁸² See also our response to the McBrides' three submissions above. #8 Tararua Aokautere Guardians Inc. #297 Wheeler J. Comments on Draft Report. Mr Wheeler here identifies other families that might be similarly affected to the Percys, but in his first submission he supported the project as a whole.

²⁸³ Henry, Second Statement Appendix 1, para 5.9.

²⁸⁴ Maassen, Counsel for PNCC *Palmerston North City Council's Response to MRP's Comments to the Board's Minute Dated 30 May 2011*, para 36(c).

This means there is strong and consistent wind with much less turbulence and wind shear making the wind quality in this area superb. In particular, the 50 year theoretical yields for these turbines are extremely attractive compared with international averages and well within international turbine design criteria. The information on the wind resource at his location is extensive as it is close to an existing and key monitoring mast.²⁸⁵

[431] Mr Henry then gave his attention ‘to balancing the positive effects alongside the adverse ones’. Reassessment of the Board’s reasoning, together with evidential montages, led him to believe that the landscape effects on turbines WT15–WT20 are not as significant as for other areas, that is:

... the views from Palmerston North are all over extended distances, therefore close audiences will not see them in particular from Fitzherbert Avenue ...²⁸⁶

The core of the Turitea Reserve will remain intact extending the line of zones to WT 20 but no further ...

In particular, these turbines will not be seen from Fitzherbert Avenue (as illustrated in Viewpoint Two (VP2)), which is highlighted in the draft report as symbolising the “signature” nature of the Tararua Ranges when viewed from Palmerston North, and being demonstrative of the Board’s “Back Ridge” ONF. Other references are made by the Board to Viewpoints Four (VP4) and Twelve (VP12). It is noted that the turbines visible in VP2 start with WT21. VP4 also only starts at WT22. VP12 is an elevated view from the Stadium at approximately 9km distance from the Ranges. While the whole wind farm is visible in this viewpoint (ie WT15 to WT20 are present), Bryant’s Hill is in foreground tempering any views to these turbines and limiting views to the Turitea Reserve. Finally, none of these 6 turbines were of concern to the Board for ecological effects.²⁸⁷

Submitters

[432] Dr Dixon, one of the submitters from 83 Ngahere Park Road, identifies he is particularly concerned about MRP’s proposal to restore WT15–WT20. He is critical that Mr Henry implies that the views from Palmerston North are all from extended distances and close audiences simply will not see them. While Mr Henry states those turbines are situated close to a wind monitoring mast on the ridge, Dr Dixon indicates because he and Mrs Dixon can clearly see this wind monitoring mast and since the wind turbines are substantially taller than the wind monitoring mast, he believes that some or all of the turbines will be seen from their property and subsequently will degrade its value.²⁸⁸

²⁸⁵ Henry, Second Statement Appendix 1, para 4.5(c)(i).

²⁸⁶ Ibid.

²⁸⁷ Ibid.

²⁸⁸ #179 Dixon, pp2–3.

[433] Another submitter considers that MRP's reinstating turbines in the location of the ONF skyline will create a further significant assault on its already reduced values.²⁸⁹

[434] The Huffman/Devey submission rejects Mr Henry's statement on the lack of impact of these turbines on those residing within local distances. They state that these turbines are clearly visible to the Harrison Hill Road (Ridgeview Road) and Pahiatua Track families as shown in RVP23 'where these turbines are identified on the ridges of the photomontage'.²⁹⁰

Evidence and Discussion

[435] As to Mr Henry's statement that some of the turbine zones declined by the Board are likely to be the most productive and therefore contribute most to the project's viability, this was an issue raised in the evidence-in-chief of Mr Wong Too and it was also raised by counsel for PNCC in his cross-examination of Mr Wong Too.²⁹¹ Counsel notes that Table 3 of Mr Wong Too's evidence identifies the mean wind speeds for the various masts put in place to test the ridgeline and elsewhere on the site.²⁹² Counsel singled out wind monitoring masts 6 and 9 as having very high mean wind speeds which are above the normal Class 1A limit. Mr Wong Too observed that the very high wind speeds at *Turitea* are at once why he considers the site 'exceptional' in national and international terms, and at the same time 'probably pushing the upper limits of whether the turbines are able to accommodate the Class 1A limit'. But, he adds 'this too will depend on the turbine manufacturer which will have some [safety] margin built in as well'. We note also that this issue is referred to in Chapter 2 of the Draft Report (also this Final Report).²⁹³

[436] We note in relation to PNCC's questioning of Mr Wong Too that Mast 6 at 11.2m/s (pushing the Class 1A limit) is in the southern half of the site where the turbine zones traverse the boundary of Hardings Park and which are being retained, thus demonstrating there is a very high wind speed also in the southern half of the site; while Mast 9 is in an area where turbine zones are also already retained – not as many as MRP would wish but with an opportunity for three more (see above). We also note that, in Mr Wong Too's supplementary evidence, other masts record very high wind speeds.

[437] Ms Lucas' attachments 20–24 clearly show vistas of Back Ridge and the turbines in question from a series of local Palmerston North streets, namely Albert and Main Road, Rangitikei Street and Tremaine Avenue and Napier Road. These streets we visited and while from some, Back Ridge becomes obscured the closer the onlooker travels toward the ranges, Napier Road (Lucas Attachment 24 *Wyatt public viewpoint 03*) illustrates very clearly how they are seen while the witness'

²⁸⁹ #87 Mildon, p3.

²⁹⁰ #317 Huffman, #664 Devey paras —6. See also RVP23 in Appendix 1 to 18 March 2010 *Comments on the Redesign*.

²⁹¹ Wong Too, EIC paras 5.2–5.4.

²⁹² Ibid, NOE 77.

²⁹³ Draft Report, Chapter 2 *Turitea's Wind Resource* paras 14–16, 21.

identification of the location of Bryant Hill (Mairehau) demonstrates how far away from WT15–WT20 Bryant Hill is and that it does not obscure Back Ridge.

[438] But public and private views are not the only issues alive with Back Ridge. We have found as matters of fact that it is part of an ONL and ONF, under s6(b) RMA and part of the Skyline ONF under the RPS for the region. These have all the innate values attributed to them throughout Chapters 12, 13 and 18 – values that are not reliant on just being seen or where they are seen from.

[439] Finally, in the course of revisiting the evidence on turbines of locations WT15–WT20 we looked again at Mr Shaw’s Table on Ecological Effects attached to his evidence-in-chief.²⁹⁴ This states that for the WT15 and WT19 turbine zones their ecological values are ‘high’ and the degree of impact on the project is also ‘high’. They both have ‘notable features’ in the species with the ‘threatened plant species *Brachyglottis kirkii*’ present.²⁹⁵ WT16–WT18 turbine zones also are located on sites of ‘high’ ecological value and the degree of impact of the project is also ‘high’.

[440] In retrospect, we acknowledge that we were too lenient in our acceptance of Mr Shaw’s conclusion that these six turbines were not of concern for ecological effects.²⁹⁶ The ecology of these turbine zones is clearly in fact part of the ecological continuum we have found to exist along the internal part of the reserve as set out in Chapters 12, 13 and 19. The suggested turbines are in fact located on part of the area we see as ecologically significant under s6(c). Six large concrete platforms would be constructed and then left in this area if we allowed these turbines to be reinstated.

Group 3 Turbines WT122–WT124

Introduction

[441] Mr Henry states that the three turbine zones MRP seeks to reinstate in the southern areas (WT122–WT124) are within the area ‘deemed to be acceptable for wind turbines’. While he acknowledges that the turbines have amenity effects on the residents of Greens and Kahuterawa Roads, he notes these effects have now been tempered by the deletion of WT127–WT134 in the Draft Report.²⁹⁷ He considers that the main issue with respect to the proposed reinstatement of turbines WT122–WT124 was their localised amenity rather than their wider localised effects. Nevertheless, MRP considers it is appropriate these three Group 3 turbine zones be reconsidered because (inter alia) (together with the deletion of WT125) they generate enough power for 4,000 houses.²⁹⁸ The Board’s primary concern is with ONFs and ONLs when viewed from Palmerston North; the potential options for mitigating adverse effects of the turbines on the closest

²⁹⁴ Shaw EIC, Attachment WBS8.

²⁹⁵ See Gabites, EIC para 129 and p28 Table.

²⁹⁶ See Draft Report, Chapter 8, paras 104–105.

²⁹⁷ Henry, Appendix 1 Second Statement, para 4.5(ii).

²⁹⁸ Ibid, para 5.14(a), (b), (c), (d).

residential properties are outlined in the evidence of MRP (unspecified); and the need to consider carefully the sustainability of two ‘non-contiguous’ wind farms created by the Board together with the resulting delay of the construction of the southern part of the wind farm.²⁹⁹

Submitters

[442] PNCC submits that the three Group 3 turbines were abandoned because MRP accepted the advice of its expert, Mr Brown, that they had unacceptable landscape effects. MRP was entitled to amend its own application while the Board was tasked with considering MRP’s application (now amended as a result of the redesign). The question then arises: ‘can the Board now inquire into what was abandoned’?

[443] For the landowners, Mr and Mrs Love’s concern is that the locations of these turbines differ little from those deleted by Mr Brown in the redesign and therefore may be unacceptable to the Board.³⁰⁰ Included in their response was an analysis on the visual impact on nearest neighbours as a matter of greatest concern, an analysis of visual impact on nearest neighbours with percentages of turbines obscured from viewpoints, and horizontal distances from the MRP proposed turbines. They also included an analysis of alternative recessed locations for the three turbines, which the Love’s proposed after the redesign and again in response to the Draft decision.

[444] Huatau Marae is also disaffected by the suggested reinstatement of WT122–WT124. Its submission indicates that there was consultation with MRP over the issue whether WT122-WT124 be removed or reinstated, and while they were not completely satisfied with the result, their objection was seriously reduced because of the lessened adverse effects on landscape, visual amenity and noise with the turbines removed. The marae owners now see MRP’s new proposal as an abuse of the RMA process if the call-in process is to have any credibility.³⁰¹

Evidence and Discussion

[445] The Love response reopens the Brown evidence and provides no vehicle for redress by submitters. Thus there is a danger of acquiescing *at all* to MRP’s request and Mr Henry’s second statement. A further hearing is not what s148(4) provides for.

[446] In the first part of the hearing, Mr Love questioned Mr Brown extensively on aspects of his redesign. Mr Brown pointed out it was his task to address the impacts of the wind farm on all properties and all vantage points not just to focus on individual ones. He further pointed out he visited all of the viewpoints identified in the photomontages and viewpoints so he could gain a

²⁹⁹ Maassen, Counsel for PNCC, *Palmerston North City Council’s Response to the Board’s Minute Dated 30 May 2011*, paras 11–12.

³⁰⁰ #683 K and J Love, para 3.

³⁰¹ #9 Huatau Marae, Further Comments, para 35(a), (b), (c) and (d).

complete appreciation of the ‘context’ of the views as well as the views themselves.³⁰² Here, we repeat what we have earlier stated about Mr Brown’s evidence about the turbines identified in RVP21 (WT122–WT125) as dominant in their location, he said this:

In this instance the turbines would appear to sit right on top of that key ridgeline which defines this catchment. So my perspective and this particular view, given that this is also a view that also catches part of the valley corridor which is less modified than other parts of the landscape around Turitea, and has considerable appeal from my point of view, I felt that the turbines as proposed would sort of loom over this part of the catchment.

They would have a dominating effect. Their elevation and their relationship to the landforms that they would be sitting on would create that situation and I felt that that was inappropriate.³⁰³

[447] Mr Brown is a widely experienced landscape architect and shown to be so in that MRP sought his professional advice on the redesign. Other parties relied on his decisions except for some of the landowners. As to the Loves’ submission on the reinstatement of WT122–WT124, they have introduced new evidence which contradicts what Mr Brown has stated. The Board, meanwhile, has accepted as fact from its own assessment of the site of these turbines, based not only on the evidence of Mr Brown but also that of Mr Anstey. Nearby residents such as the Pugmires have relied on the deletion of these turbines and been pleased by it – a point made by senior counsel for MRP, in his cross-examination of Mr Anstey.³⁰⁴

[448] As to the other matters Mr Henry raises in his statement:

- the Board recognised in the Draft Report how much power generation the turbines taken out on the Love property produced;³⁰⁵
- our primary concern was not for only ONLs and ONFs when viewed from Palmerston North; the protection of an ONL and ONF is a nationally important issue for the values they hold; where they are viewed from is another matter;
- the Board was also concerned about residential amenity demonstrated by the fact 16 turbines also were taken out for residential amenity reasons;
- as to the potential options for mitigating adverse effects of the turbines on the closest residential properties, there is no condition to that effect in MRP’s list of conditions and we do not see it as having practical value in a landscape consisting of ridgelines and hillocks and very tall turbines.³⁰⁶

³⁰² Brown, NOE 3097–3100.

³⁰³ See Draft Report, Chapter 13, paras 348–350.

³⁰⁴ Anstey, NOE 3176. See also #717 and 563 Pugmire, Submission on Redesign.

³⁰⁵ Draft Report, Chapter 13.

³⁰⁶ See Appendix 4.

[449] The final point we make is that MRP's request and Mr Henry's statement is predicated upon the company's conclusion that we did not take into account economic sustainability and viability. We consider this issue is ill-founded and addressed it under Chapter 4.³⁰⁷

Finding

[450] The Board finds that:

- if MRP wishes to add three turbines to Group 1 this should be pursued as a variation to the consents granted in this Final Report;
- its Draft Report decision to delete WT15–WT20 is reaffirmed;
- MRP's March 2010 redesign layout deleting WT122–WT124 is confirmed.

³⁰⁷ See Draft Report, Chapter 4 and *Board's Response to MRP's Comments on the Draft Report*.

Chapter 14: Traffic Issues

Introduction

[1] In this chapter of our report we consider the effects on the highway and roading network adjoining *Turitea* from the transport of the turbines and other wind farm infrastructure components and construction materials, with particular emphasis on the proposed southern access along Kahuterawa Road and Greens Road.

Submitters

[2] Numerous submitters provided concerns about the traffic implications of the construction of the wind farm, particularly in the vicinity of Kahuterawa and Greens Roads.

Issues

[3] The key traffic issues associated with the development and operation of the wind farm include:

- the transport of the turbine components (towers, nacelles, blades) from the port of landing (either Port Napier or Port Taranaki) to the proposed northern access to the wind farm at the summit of Pahiatua Aokautere Road (the Pahiatua Track);
- submitter concerns over the proposed use of Kahuterawa Road and Greens Road as the southern access for construction traffic;
- the proposed timings and volumes (peak and average) of construction plant, labour and materials for the northern and southern accesses to the wind farm;
- noise from construction traffic;
- projected operational traffic post the completion of the wind farm;
- compliance of the proposed construction traffic with the regional and district plans;
- the Board's concern over some of MRP's proposed conditions of consent and a request to MRP for a revision of these conditions to take account of these concerns.

Experts

[4] Three experts gave evidence on traffic issues, Mr Richard Galloway for MRP, a senior traffic engineer with Traffic Design Group who has had involvement in more than 12 wind farm projects both in New Zealand and the

United Kingdom; Mr Daniel Tate for PNCC, a traffic engineer employed by the council; and Mr David Wanty, a senior traffic and safety engineer with consultants MWH, who was engaged by the Board to prepare the s42A traffic impact report.

Evidence and Discussion

Turbine Transport to Turitea

[5] It is anticipated that the primary turbine components (towers, nacelles, blades) will be manufactured overseas and then landed at either Port Napier or Port Taranaki for onward transport by road on specialist haulage vehicles to *Turitea*. Access onto the site for all of these components is proposed at South Range Road, which joins Pahiatua Aokautere Road (a section of the Pahiatua Track) near to its summit. Pahiatua Track is a direct connection between SH2 in the west and SH57 in the east. Mr Tate in his evidence advised us that it is defined as a Principal Road or Secondary (District) Arterial.

[6] Whilst we were told that the route from Napier offers advantages over the New Plymouth alternative, with a shorter travel distance and associated logistic advantages, for completeness and drawing on the evidence of Mr Galloway, we set out here a brief description of both routes.

[7] The route from Napier would use SH50 and SH2. We were told that these state highways are built to a high standard, with geometry that is readily capable of handling over-dimension loads. Apart from three bridges on SH2, all other bridges have adequate capacities for carrying the anticipated overweight loads under specified operating conditions.

[8] The three bridges with limited capacity for overweight loads of the type envisaged are the Whakaruatapu, Papatawa and the Oringi. Mr Galloway advised that further investigations during the detailed design stage will most likely establish that these bridges can accommodate the heavy loads without extra strengthening. These investigations, coupled with the timing of a number of planned bridge upgrades, are expected to confirm the feasibility of the state highway section of the Napier transport route.

[9] At Pahiatua, the Napier route leaves SH2 and continues on Pahiatua Mangahao Road, Makomako Road and then onto Pahiatua Aokautere Road (collectively known as the Pahiatua Track). Several minor improvements would be required to parts of the Pahiatua Track on the eastern side of the summit. These would include some power pole relocations and the carriageway widening at the Pahiatua–Mangahao intersection with Makomako Road. None of these improvement works are seen to be an impediment to the successful use of this route.

[10] The western route from Port Taranaki has already been used for turbine component transport to Centre Road on SH57 for the *T3* wind farm project (which is north of the *Turitea* site), although we note that the turbines proposed for *Turitea* are larger than those used on *T3*. The route follows SH3 to the turn off

onto Fitzherbert East Road (SH57), just before the entrance to the Manawatu Gorge. A number of bypasses would be required to avoid either low bridges or an urban portion of the state highway through Palmerston North.

[11] The route then continues on along SH57 to join the Pahiatua Track at a relatively wide intersection some 14 kilometres south west of SH3. The 9 kilometre stretch of road from this intersection up the Pahiatua Track to the summit has been progressively upgraded and this winding alignment has a sealed carriageway with a reasonably generous cross-section. One bend would need to be upgraded to accommodate the long turbine blades.

[12] As with the Port of Napier route, there are no obvious impediments to the successful transport of turbine components from the Port of Taranaki.¹

Access for Construction Plant, Labour and Materials

[13] As well as the turbine components, access to the site will also be required for construction plant, labour and materials for all of the components of the wind farm including the substations, transmission lines, roads, turbine sites and turbine bases.

[14] We were advised by Mr Galloway that there would be a northern access to the site from the Pahiatua Track onto South Range Road. There would also be a southern access which would follow Kahuterawa and Greens Roads before entering a farm track on the Love property near to the end of Greens Road.

Volumes of Construction Traffic

[15] We note in his evidence, that Mr Galloway variably quotes *average* traffic volumes and *maximum (or peak)* volumes. In our view, the primary focus should have been on the effects of *maximum* or *peak* volumes. Whilst *average* volumes provide an indication of the overall duration when certain types of traffic can be expected, depending on the duration chosen, *averages* can give a misleading (and understated) indication of the worst effects of construction traffic.

[16] On the other hand, *maximum* or *peak* volumes, their durations and when they will occur during the day are likely to have the most influence on the safety and efficiency of the affected roading network.

[17] Mr Galloway provides a table summarising the *average* levels of external traffic expected to be generated during each phase of the construction of the wind farm which was originally proposed by MRP. We acknowledge that these levels would be somewhat less under the redesign and less again for the number of turbines consented under our decision.

[18] Traffic generation is expressed as vehicle movements where one return trip involves two vehicle movements. This table is reproduced below.

¹ Galloway, EIC paras 29–41.

Total Average Forecast Traffic Generation

Phase	Start	End	Average Daily Traffic Generation		
			Over Dimension Vehicles	Heavy Vehicles	Light Vehicles
Earthworks (Roads)	Month 0	Month 16		80	50
Foundations	Month 12	Month 27		40	50
Turbine Installation	Month 18	Month 37	6	20	110
Commissioning	Month 21	Month 38		20	40
Project Average	Month 0	Month 38	1	68	113

[19] From the table, it can be seen that the busiest time will be during the four-month overlap of the earthworks and the foundation phases, when the daily average traffic levels are expected to peak at around 220 vehicle movements including some 120 trucks. Over a working day, these numbers could be expected to average out at around 22 vehicles per hour including 12 truck movements.²

[20] Mr Galloway advised that around 90% of this construction traffic would use the northern access and 10% the southern access.

[21] With many residents having expressed considerable concern over the effects of construction traffic using Kahuterawa and Greens Roads, Mr Galloway undertook a more detailed assessment to determine the *maximum* construction vehicle movements on these roads. His findings are set out in Attachment 2 of the *Further Joint Statement of the Traffic Experts* (signed by the experts on 16 July 2009), and these are summarised in the following table.

Southern Access: Kahuterawa and Greens Road: Daily Maximum Vehicle Movements

Activity	Vehicle Type	Forecast Movements	Approx Timing	Comment
A: General Movements per Day				
Road Pavement Materials	Truck and Trailer	14	First 3–4 months	
Substation General/ Internal Roads	Trucks	20	First 3–4 months	
Total		34		
B: One-off Movements				
Road Upgrade Machines	Low Load Trailers	20	First month	Spread over number of days
Substation Concrete	Concrete Trucks	40	First 3–4 months	On total of 4 days
C: General Access	Light Vehicles (Vans, Utes)	50	First 3–4 months	
	Ditto	100	Year 2	
	Ditto	10	From Month 27	

² Galloway, EIC paras 78–98.

Activity	Vehicle Type	Forecast Movements	Approx Timing	Comment
D: Other				
Transmission Poles	Transporter	15	Over 6 months	Possible option of alternative access

[22] From this table, it can be seen that a *maximum* of 34 truck movements per day are forecast to use the southern access over the first three-to-four months, primarily for the widening of the water catchment access road. Depending on the finally agreed working hours per day, this would equate to an average of say four truck movements per hour.

[23] We note that this *maximum* of 34 truck movements per day compares with an *average* of 12 movements per day based on 10% of the total from the earlier *Total Average Traffic Generation* table. This highlights our concern over the differences which can occur between *average* and *maximum* volumes.

[24] For this southern access, the maximum construction vehicle usage over the first three-to-four months, including light vehicles (50) and trucks (34), is forecast at 84 movements per day. Also, after the first three-to-four months, the forecast use of this southern access will be primarily for light vehicles to a maximum of around 100 movements per day. It is not clear to us as to why the number of light vehicles is forecast to double from the end of fourth month.

[25] As for the *average* forecast traffic levels set out in paragraph 18, with the reduction in the number of consented turbines, the *maximum* vehicle movements could also be expected to be somewhat less than those set out in the table at paragraph 21. We do note, however, that over the first three to four months most if not all of the heavy vehicle movements forecast by Mr Galloway are required for the upgrade of the water catchment access road, with this being more or less independent of the number of turbines in the wind farm.

[26] Having established the forecast levels of construction traffic entering and leaving the site at each of the proposed access points, we now turn our attention to an assessment of the effects of this traffic on the external roads which connect to these access points.

Northern Access

[27] It is proposed to close the existing substandard Pahiatua Track–South Range Road intersection and to replace this with a permanent intersection to be constructed some 180 metres to the west. A short length of new road would be constructed to connect this new intersection with the existing South Range Road. If the turbines were to be transported from New Plymouth, the new intersection would include an additional temporary sealed area to accommodate the swept paths of the turbine transporters. On completion of construction, this temporary sealed area would then be removed and, subject to the agreement of PNCC, the new intersection would be vested with the PNCC as the permanent access to South Range Road.

[28] The proposed closure of the existing intersection and the minor realignment of an existing farm track onto the new length of South Range Road will ensure that this new intersection falls within the requirement of Table 20.3 of the PNCC District Plan (PNCCDP) for a minimum separation distance of 200 metres from other accesses or intersections.

[29] This same plan requires minimum sight distances of 275 metres from the intersection. This is achieved when looking west towards Palmerston North, but eastwards, with a sight distance of only 170 metres, it falls short by 125 metres. However, as Mr Galloway has pointed out, speeds on the approach from the east are limited by the tight geometry of the corner, with the 85th percentile speed assessed as being no more than 50km/h. For this speed, he has identified from the Austroads Guide to Traffic Engineering Practice that a minimum safe sight distance of 96 metres should be provided, this being substantially less than the actual of 170 metres. He also points out that this distance is well in excess of the eastwards sight distance of 30 metres at the existing intersection.

[30] Rule 20.3.9.1(b)(ii) of the Plan requires that the width of new accessways onto the Pahiatua Track should not exceed 6 metres. For the proposed new accessway from South Range Road, Mr Galloway notes that a sealed width in excess of the 6 metres is required to accommodate the turning paths of the large transport vehicles and that this will be a temporary measure only.

[31] Mr Wanty, author of the s42A Report, considers that the proposal to relocate the existing permanent access to the west will have a lasting positive traffic safety effect well beyond the project itself with the existing access failing to meet any recognised technical standards.

[32] If the turbines were to be transported from Napier, it is proposed that a second (and temporary) site access would be constructed about 1.1 kilometres to the east of the existing intersection (in the Tararua District). Whilst the Pahiatua Track already has a generous sealed width at this location, some additional sealing would be required to provide a smooth alignment. There would also be some excavation of the slope to the east to improve sight distances which would be in excess of 100 metres in both directions.

[33] Mr Galloway notes that the posted speed limit on this road is 100km/h although the geometry in the vicinity of this temporary access would restrict speeds to around 50km/h westbound and 45km/h eastbound. Whilst neither the Operative nor the Proposed Tararua District Plans (TDPs) set sight distances for arterial routes, such as the Pahiatua Track, Mr Galloway notes that for the predicted speeds, the minimum sight distances of 100 metres in each direction would comply with the safe intersection distance provisions of the Austroads Guide to Traffic Engineering Practice.

[34] Mr Galloway also provided details of the vehicle counts for the Pahiatua Track of around 1,600 vehicles per day climbing to 4,000 vehicles per day when the Manawatu Gorge is closed for repair, for flooding or for other weather-related conditions. He also notes that most commuter travel from the eastern side of the Tararua Ranges is between 7:00am and 9:00am in the mornings and between 3:00pm and 6:00pm in the evenings. Vehicle counts within these peak two-way

flows are less than 200 vehicles per hour. Weekend flows are stable in the range of 150 vehicles per hour and 170 vehicles per hour at the busiest times.

[35] Mr Tate shows evidence that Mr Galloway did not have access to. More recent vehicle counts show the average counts to be around 2,000 vehicles per day peaking at around 200 vehicles per hour, with around 6% of these (120 per day and 12 per hour) being heavy vehicles. He also notes that at the time of the last significant closure of the Manawatu Gorge in 2004 the weekday vehicle numbers increased to between 5,200 and 7,100.³

[36] We note that, for the purpose of considering the effects of the wind farm construction traffic on the Pahiatua Track, there appears to be little practical difference between these two sets of numbers.

[37] As we have already noted, for the original design, the additional traffic on the Pahiatua Track generated from the construction of the wind farm (90% of the total construction traffic) was forecast to peak at an average of around 200 vehicle movements per day including some 110 trucks. These numbers would average out at around 20 vehicles per hour including 11 truck movements.

[38] These numbers represent an increase of about 10% in the total number of vehicles currently using the Pahiatua Track during weekday peak hours and at busy periods at weekends. In addition, the number of heavy vehicles would almost double from around 12 per hour to 23 per hour.

[39] Turning to the accident record for the Pahiatua Track, Mr Galloway has provided details of reported injury accidents from the New Zealand Transport Agency road accident database for the five years from 2003 to 2007. He did not include statistics of the total number of accidents in his evidence.

[40] Mr Galloway's analysis shows a concentration of accidents on the western side of the Pahiatua Track summit where 14 injury accidents occurred, compared with just two on the eastern side. He notes that the accident rate for the western side is consistent with national patterns with a derived rate of approximately 67 injury accidents per 100 million vehicle kilometres.

[41] Mr Tate provided statistics for all accidents for the period from 2004 to 2008 as well as for the first two months of 2009. He notes that, for the Pahiatua Track from SH57 to Makomako Road, there were 22 accidents causing injury (21) or death (1), and a further 41 accidents where there were no injuries, with one-third of the accidents resulting from speed. He also notes that the injury accident rate is about twice that expected for rural roads.

[42] It is not clear why there is a difference of a factor of two between the injury accident rates calculated by the two experts although it may be that this has resulted from the experts using different statistical indicators.

[43] Overall, having considered the proposed increases in traffic volumes for the maximum situation of the original design, both Mr Galloway and Mr Tate

³ Tate, EIC para 10.

have concluded that the Pahiatua Track will not exceed its design capacity and that the upgrade of this road beyond works to accommodate any abnormal loads will not be required.

[44] Mr Galloway also notes that the accident statistics demonstrate the need for very careful attention to safety when allocating construction traffic to this route, particularly if Port Taranaki is the favoured starting point for the *Turitea* turbines.

[45] In a matter not specifically addressed by any of the traffic experts, we note that the design of the Pahiatua Track/South Range Road intersection(s) will need to place specific emphasis on safety for construction traffic crossing the paths of other traffic when entering and leaving South Range Road. If consent is to be granted, these safety considerations will need to be supported through consent conditions.

[46] Mr Wanty raised a number of other concerns about the use of the Pahiatua Track for construction traffic. These concerns were resolved in a joint meeting of the three traffic experts with the outcomes recorded in the *Further Joint Statement of Traffic Experts* as discussed later in this report.^{4, 5}

Southern Access

[47] The southern access follows Kahuterawa Road from its intersection with SH57 to Greens Road and then entry onto the site via an existing farm track on the Love property.

[48] We were told that the state highway intersection is of a high standard having been recently reconstructed with a ‘Give-Way’ control.

[49] Kahuterawa Road has a typical sealed width of 5.5 metres and Mr Galloway is of the view that no road widening works will be required to accommodate the anticipated construction traffic apart from sealing parts of the road to minimise noise and dust. It is also his view that this road is capable of carrying an additional seven truck movements a day on *average*, subject to there being a proper construction traffic management plan to address *peak* days.

[50] For Greens Road, improvements are planned for the hill section, some tight bends are to be widened, and sections of the surface are to be regraded and sealed to improve traction. To assist with reducing truck noise, during the hearing, MRP also agreed to seal the road along the front of the Adams property as well as a length of the access road into the Love farm.

[51] PNCC has recorded an average of 380 vehicles per day on Kahuterawa Road with morning and evening peaks of 40 vehicles per hour. The daily total includes about 12 heavy vehicles.

⁴ Wanty, s42A Report, para 7.5.1.

⁵ *Further Joint Statement of Traffic Experts*, 14 July 2009, paras 23–24.

[52] In addition to motorised vehicles, on weekdays, Kahuterawa Road also carries a relatively high volume of cyclists commuting to and from work or school, and during the weekends, cyclists and mountain bikers access the public tracks at the end of the road.

[53] As we have also noted, many residents who live along Kahuterawa Road have considerable concerns over the potential impact of construction traffic on other road users. Several indicated that even now it was impossible for vehicles to pass in some places and with no berm available for safety, those riding bicycles or horses or walking could well be forced into the ditch to avoid the passing construction traffic.

[54] Some residents also claimed that the school bus, which collects children at the intersection of Kahuterawa Road and SH57, does not travel along Kahuterawa Road because of safety concerns. In response, Mr Galloway advised that he had checked with the Ministry of Education's local service agent for school transport who had advised that not using Kahuterawa Road was not an issue of safety but rather one of efficiency.

[55] In his evidence for Greens Road, based on nine households, Mr Tate had adopted a recommendation from the New Zealand Trips and Parking Database to arrive at an existing usage of 80 vehicles per day.⁶ Conversely, the Adams, who live on this road, estimated a usage (unverified) of about 24 vehicles per day based on their own personal weekly count.

[56] In a memorandum to the Board dated 3 September 2009, Mr Tate confirmed the methodology he had used to arrive at his estimate. He also confirmed that neither his or the Adams' estimate would alter his opinion that Greens Road has sufficient capacity to accommodate the forecast numbers of construction vehicles.

[57] Irrespective of which estimate is adopted, the forecasts provided by Mr Galloway show that there will be a major increase in the volume of traffic using Greens Road during the construction of the wind farm. We support Mr Tate's view that increases over the status quo need to be considered within the framework of the proposed traffic management plan when evaluating the suitability of this road for construction traffic.

[58] Mr Galloway records that, over five years, only three injury accidents were reported for Kahuterawa and Greens Road. Again, Mr Galloway has not reported total accidents. He does acknowledge, however, that there can be under-reporting of accidents in rural areas, an observation backed up by a number of local residents who told us that there were quite frequent non-injury accidents. It is Mr Galloway's view that the crash rate does not indicate any specific underlying safety issues which need to be addressed on these roads.

[59] Mr Tate has noted in the period from the 2004–2008, 10 crashes occurred on Greens Road and Kahuterawa Road, one resulting in a serious injury and one in a minor injury. Nine of the 10 crashes involved vehicles losing control, seven

⁶ Tate, EIC para 9, Table 1.

from travelling too fast, one from a mechanical fault, and one from a cyclist travelling too fast, cutting a corner and hitting an SUV (resulting in the serious injury). He notes also that the injury crash rate is only slightly above the expected rate for this class of road.

[60] Mr Galloway notes that Greens Road and also Kahuterawa Road do not comply with the 6-metre maximum width nor the 250-metre minimum sight distance required under the PNCCDP.

[61] It is Mr Galloway's view, however, that with the road alignments severely limiting speeds, the expected low volumes of traffic, and the proposed construction traffic management plan, this southern access should function well within safe and appropriate standards.

[62] We return later to our concerns with the currently proposed construction traffic management plan as this relates to these two roads.

Further Joint Statement of Traffic Experts

[63] In his s42A Report, Mr Wanty reported on the proposed conditions of consent which had been agreed to in an earlier Joint Statement of Traffic Experts prepared by Messrs Galloway and Tate. Mr Wanty was of the opinion that these conditions would form a competent basis for mitigating the traffic effects of the proposal. In doing so, however, he raised a number of matters for further discussion and resolution with the other two engineers. These included the proposed exclusion of public holidays from the construction traffic operating hours, including Easter Saturday and the eve of public holidays; consultation with users of Turitea Reserve and Hardings Park prior to any agreement on the construction traffic management plan; more information on the trucks (type, route, load) accessing the site, along with expected peak daily flows; the need to provide pullover areas/passing opportunities for the construction truck traffic using Pahiatua Track; the assessment and minimisation of delays to Pahiatua Track traffic from over-dimension construction vehicles; the effects of noise based on the updated average daily flow volumes and on peak daily flows and the incorporation of noise standards; the relocation of the driveway by the proposed new South Range Road intersection to be at least 20 metres clear of the Pahiatua Track carriageway; and the redesign of the new South Range Road intersection in a manner that restricts its normal width while still enabling over-dimension loads to access South Range Road (for example, through the use of mountable kerbs).

[64] The three traffic experts met to discuss these issues and from this produced the *Further Joint Statement of Traffic Experts* (dated 16 July 2009) which included a series of recommendations for the proposed conditions of consent.

[65] Matters agreed to by the experts not already covered so far in this decision were that it would be appropriate to specify that the Greens Road access should not be used by heavy commercial vehicles on public holidays; that these vehicles should be limited or restricted on days such as Easter Saturday, the

period between Boxing Day and New Year, and on the days of particular events to be determined through the construction traffic management process.

[66] Mr Tate also advised that PNCC had investigated the need for passing lanes or slow vehicle bays on the Pahiatua Track and had concluded none were warranted. As well, there are expected to be only minimal delays (one-to-two minutes) when transporters need to occupy the opposing traffic lane on this road with pilots accompanying the transporters and stopping traffic as required.

Post-Construction

[67] We were advised that once construction is completed, the wind farm will generate very little traffic. The traffic that will occur will comprise a small team for the day-to-day maintenance and operation of the wind farm, together with a small level of general visitor traffic.

[68] Mr Galloway advises that this post-construction access will be predominantly from the new Pahiatua Track–South Range Road intersection. It was not clear to us as to what volume and types of traffic would continue to use the southern access. Given the constraints of the design standards of the roads leading to this access, in its response to the Draft Report, MRP was requested to provide us with a firmer indication on the proposed ongoing use of this southern access by wind farm operational vehicles.

Traffic Noise

[69] We note the *Noise Conditions, Matters Agreed to by All Parties*, attached to the Joint Statement of Experts – Noise and, in particular, the conditions relating to construction noise and non-turbine operational noise. We have addressed these conditions as they relate to construction traffic noise in Chapter 15 of our report.

The Planning Provisions

[70] The PNCC District Plan, the Operative and Proposed Territorial District Plans and the Horizons Regional Council Land Transport Strategy (RLTS) and Land Transport Rule – Vehicle Dimensions and Mass 2002 all contain provisions for the management and control of traffic associated with the construction of the wind farm.

[71] Where relevant, these provisions have been referenced throughout the main body of this part of our decision on traffic impacts.

[72] In a more general sense, Section 3.2.1 of the Tararua District Plan contains a number of ‘desired characteristics’ for activities in the rural zone, including:

- (m) Safe and efficient vehicular access and movement throughout the District.

[73] The PNCC District Plan contains five specific policies relating to wind farms in Chapter 9.9.2, including:

- (d) To avoid, remedy or mitigate the adverse effects on the safe and efficient operation of the roading network from the traffic movement generated by activities.
- (e) To ensure the provision of on-site parking, loading, manoeuvring and access space to avoid this taking place on roads.

[74] For Policy 9.9.2(e), most of South Range Road will need to be established as a Construction Zone and closed for a time when oversize earthmoving machinery is operating to develop the turbine sites alongside the road. Residents, their visitors, and others with a specific purpose will, however, continue to have access. There should be more than adequate parking for construction vehicles.

[75] The Horizons RLTS for the Manawatu–Wanganui Region outlines the transport policies of the region for the next 10 years, along with an implementation strategy and corresponding performance indicators. In developing the proposed wind farm, the following policies in Chapter 6 are relevant.

- Policy 3: Maintain and improve the rural road network to provide safe and efficient access to rural areas.
- Policy 10: Ensure freight movement within and through the region by the most efficient sustainable means.
- Policy 12: Ensure effective integration of transport and land use planning in growth areas of the region.

[76] The movement of over-dimension and overweight loads associated with the construction of the wind farm will be controlled and managed through the Land Transport Rule – Vehicle Dimensions and Mass 2002. This rule sets out the law relating to the movement of regular and oversize loads on public roads, with the objective being to manage the risks to road safety resulting from the dimensions and mass of vehicles.

[77] It is proposed by MRP that the Construction Traffic Management Plan (CTMP) includes a sub-set of provisions for the over-dimension and overweight loads which require permits from the New Zealand Transport Agency and/or the relevant road controlling authorities. These permits, which will be applied for at the detailed design stage of the project, will require MRP to demonstrate the safe and efficient movement of the necessary vehicles.

[78] Apart from reservations about the safe use of Kahuterawa and Greens Roads for construction traffic, we are generally satisfied that the traffic requirements of each of the regional and district plans can be adequately satisfied under the traffic component of MRP's wind farm proposal.

[79] We have included our evaluation of the traffic impacts against the relevant provisions of the RMA in a later section of this decision as part of our overall evaluation of the proposal.

Draft Report Findings

[80] In our Draft Report, our overall evaluation of the traffic impacts from the proposed wind farm was considered under three headings, the transport of the turbine components to the wind farm site, the suitability of the proposed northern access for construction traffic, and the suitability of the proposed southern access for construction traffic. Having completed this evaluation, we then considered the proposed conditions of consent contained in MRP's 28 March 2010 Resource Consent Conditions.

[81] The movement of over-dimension and overweight loads over a roading network is quite common and follows well-established procedures under which permits are sought from the New Zealand Transport Agency and/or the relevant road controlling authorities. From the evidence submitted, there did not seem to be any impediment to such permits being granted for the transport of the turbine components for the Turitea wind farm, although ultimately that will be for the relevant roading authority to decide.

[82] We were also satisfied that access for the turbine components and construction plant, labour and materials could be safely accommodated using the proposed new permanent access from the Pahiatua Track onto South Range Road (and if necessary through the proposed second and temporary access on the eastern side of the summit).

[83] In reaching this conclusion, we noted that the design of the new intersection(s) would need to place specific emphasis on safety for construction traffic crossing the paths of other traffic when entering and leaving South Range Road.

[84] Turning to the southern access along Kahuterawa and Greens Roads, we were left with some considerable reservations about the suitability of these roads for the safe passage of construction traffic. We noted that our final decision on this would depend on MRP agreeing to much tighter conditions of consent than were contained within the 28 March 2010 Resource Consent Conditions.

[85] On a positive note, we concluded that once construction is completed, there should be a number of permanent benefits for the safe and efficient operation of the roading network. This will include the new Pahiatua Track–South Range Road intersection, improvements to a number of bends on the Pahiatua Track, a general upgrade of South Range Road and, if the use of the southern access is approved, the sealing of parts of Kahuterawa Road and various upgrade works on Greens Road.

Conditions of Consent

[86] At the time of completing our Draft Report, Schedule 3, Conditions 39 to 46 of the MRP's 28 March 2010 Resource Consent Conditions were the proposed conditions relating to the use of Kahuterawa Road and Greens Road (referred to as Greens Road) by construction traffic. These conditions included the proposed content of the CTMP which is to be agreed with the relevant road authority/ies.

[87] With respect to construction traffic on Greens Road the conditions included:

- a general requirement that trucks shall use Greens Road only where it is impractical to use the northern access with potential reasons given for this being times during the initial stages of construction when the central portion of the water catchment access road is being upgraded or excavated or when a crane is travelling along this road or erecting a turbine from the road;
- a limit of 5,800 truck movements on Greens Road during construction;
- a requirement that truck movements on Greens Road and Kahuterawa Road be prohibited between the hours of 6:00pm and 7:00am daily; between the hours of 7:30am and 8:15am and 3:15pm and 4:30pm on schooldays; between the hours of 7:00am and 6:00pm on Sundays and statutory holidays and when particular events notified through community consultation are held and which involve a peak in the presence of vulnerable road users such as equestrian or cycling events;
- the prohibition of the transport of turbine components on Greens Road;
- the development of agreed driver protocols including the prohibition of engine braking on Kahuterawa Road and the flat portion of Greens Road and 'one in one out' arrangements on Kahuterawa Road on days when more than 40 truck movements per day are envisaged.

[88] The Board was concerned that a number of the agreements recorded in the *Further Joint Statement of the Traffic Experts* dated 16 July 2009 had not been carried through to the Resource Consent Conditions. In particular, using information from this Joint Statement, it had prepared the table at [21] *Southern Access: Kahuterawa and Greens Road: Daily Maximum Vehicle Movements*.

[89] It noted in the paragraphs which follow this table:

- that a maximum of 34 truck movements per day were forecast to use the southern access over the first three-to-four months and that, depending on the finally agreed working hours per day, this would equate to an average of say four truck movements per hour.
- for this southern access, the maximum construction vehicle usage over the first three-to-four months including light vehicles (50) and trucks (34) was forecast at 84 movements per day; also, after the first three-to-four months, the forecast use of this southern access would be primarily for light vehicles to a maximum of around 100 movements per day; and that it was not clear why the number of light vehicles was forecast to double from the end of the fourth month.

[90] Further, attached to the Joint Statement was a document titled 'Submitter Questions and Requests' which included a letter dated 21 May 2009 from MRP to

those who attended an independent ‘Turitea Wind Farm-Traffic and Transport Meeting’ on 4 May 2009. At Item 10 of the meeting record the following question and answer was set out:

Question: Could Mighty River Power limit the traffic on Kahuterawa and Greens Road once a certain milestone was reached such as the Brown’s Flat substation?

Answer: Mighty River Power’s intention is to limit truck traffic as soon as the steep and winding central portion of the internal loop road within the Reserve is complete. This is expected to occur within the first three to four months of construction. From that point onwards the only reason for trucks to use the Greens Road access is if the loop road is occupied (such as if the crawler crane is being moved some considerable distance) or for emergency or unforeseen reasons.

[91] We accepted that if the wind farm was to proceed then some construction traffic must use the Kahuterawa Road and Greens Road access. However, the residents of these roads needed to be given much more certainty that this traffic will be substantially limited to the maximum volumes over the three- to four-month period indicated in the 16 July 2009 *Further Joint Statement of the Traffic Experts*.

[92] We were also concerned that the conditions as drafted did not restrict construction traffic on Saturdays when there are likely to be weekend recreational users of Kahuterawa Road, many of whom will be visitors and therefore unaware of the hazards posed by construction traffic. In this context, we noted that on the rural access roads to some other wind farms, Saturday construction traffic has been restricted to light vehicles transporting construction workers for short periods at the start and end of the day. It was our view that a similar restriction should apply to *Turitea*.

[93] We supported the consent conditions restricting construction traffic at other times including during the school commuting windows in the mornings and afternoons. We noted that we would have no objection to the overnight restriction finishing at 6:30am rather than 7:00am provided that this was offset by a limitation on the time period that construction traffic was allowed to use the two roads. A 6:30am start would provide a one-hour window for construction traffic before the start of the school commuting restriction at 7:30am.

[94] On another matter, as noted above, it was not clear to us as to why the number of light vehicles using Greens Road was forecast to double from 50 per day over the first three-to-four months to 100 per day thereafter.

[95] Also we were unable to find supporting reasons for the proposed 5,800 truck limit contained in the proposed conditions when this is compared with the 34 maximum truck movements per day contained in the Joint Statement of the Experts. Based on six days per week over four months this 34 truck limit would total around 3,500 movements.

[96] To take account of the above concerns, MRP was requested to develop, in consultation with PNCC and the local residents, for our approval, a revised schedule of restrictions for the use of Kahuterawa Road and Greens Road by construction traffic to include:

- the restrictions already included in the 28 March 2010 Resource Consent Conditions with the possibility that the night-time restriction could finish at 6:30am instead of 7:00am;
- the carry forward of the agreements reached in the 16 July 2009 *Further Joint Statement of Traffic Experts*, namely a limit of 34 for the maximum number of daily truck movements, with this restriction to be limited to one defined period of four months' duration except where truck access is required at times when the internal loop road is closed by the turbine erection crane either travelling along the loop road or obstructing this road during the erection of a turbine;
- the restriction of construction traffic on Saturdays to a set number of light vehicles for the transportation of construction workers over two short defined periods in the morning and the afternoon.

[97] Turning to the CTMP, Mr Galloway told us that the purpose of the CTMP is to ensure that all stakeholders understand the full extent of the works and are kept up to date with such matters as the project timing, temporary traffic control measures, driver protocols, communication procedures, access upgrades, travel routes, traffic flows, hours when each of the accesses will be used, road improvements and project contacts.

[98] He also told us that it is proposed that the initial CTMP will be prepared at the detailed design stage and circulated to all stakeholders for their input, including the residents of Kahuterawa, Greens and South Range Roads. It will then be submitted for approval to the PNCC and TDC.⁷

[99] The CTMP will then be progressively updated as a living document to incorporate schedule changes with all stakeholders being sent these as and when changes occur or are anticipated.

[100] The CTMP will include a sub-set of provisions for over-dimension and overweight loads which require permits from the New Zealand Transport Agency and/or the relevant road controlling authorities, under the Land Transport Rule – Vehicle Dimensions and Mass 2002. These will include a detailed schedule of dates, times and routes for oversize loads; detail of all locations where traffic will be required to stop, including bridges and narrow winding portions of road; proposed piloting and other traffic management arrangements; details of how overtaking opportunities will be provided for other road users; monitoring arrangements including queue lengths and delay times; contingency plans for breakdowns, accidents or severe weather; and arrangements for advice to New Zealand Police, emergency services, local authorities, affected land owners, and the rail authority, On Track.

⁷ Galloway, EIC para 16.

[101] We accept the concept of the CTMP as proposed by Mr Galloway and as included in the 28 March 2010 Resource Consent Conditions. We also acknowledge that final approval of the CTMP must lie with the relevant road controlling authority or authorities.

Board Consideration of Comments on Draft Report

[102] Comments on the traffic chapter of the Draft Report and MRP's May 2011 revised traffic conditions were received from MRP, PNCC and a number of submitters, primarily residents of Kahuterawa Road and Greens Road.

[103] In our Draft Report we had requested MRP, PNCC and the residents of Kahuterawa and Greens Road to meet to discuss the proposed amendments. We were most disappointed to learn that this meeting did not take place until near to the end of the comments period, that PNCC chose not to attend, and that, as a result, the meeting did not move much beyond the expression of residents' concerns at what they saw as being only a perfunctory attempt by MRP (and PNCC) for any meaningful consultation on the traffic conditions.

[104] As a result, the essence of the submitter comments was frustration at the lack of consultation on the traffic conditions and a general view from those who responded at what they considered to be the inappropriate use of Greens Road and Kahuterawa Road by construction vehicles.

[105] In her comments Mrs Harker, a submitter, was very critical that the Board was prepared to accept MRP's proposal for a peak of 220 daily vehicle movements including 120 trucks on Kahuterawa Road and Greens Road.⁸ Unfortunately, Mrs Harker does not appear to have read the qualification that these movements are the **total** for both the northern and southern accesses to the wind farm and that only 10% of these totals would use the southern access. This is confirmed in Schedule 3 in the table at Condition 42 of the March 2010 Resource Consent Conditions, which limits trucks to 34 vehicles per day except for four occasions when this limit is lifted to 60 trucks per day, with these provisions being restricted to the first five months of construction.

[106] In response to a matter raised by a submitter, Mr Shilton, the Beca drawing for the widening of Greens Road has been modified to include the detail of the proposed road cross-section including a sealed width of 6.2 metres.⁹

[107] We note also from Mr Love's comments over the extent of local resident concerns that attendance at the residents' traffic meeting was limited to about 25 households from Kahuterawa Road and Greens Road out of a total of about 60 affected households.¹⁰

[108] In its comments, PNCC advised that its traffic engineer had reached agreement with MRP's traffic engineer on the May 2011 traffic conditions,

⁸ #579 Harker, *Final Comments* para 2. See Chapter 14, para 19.

⁹ #719 Shilton, p3.

¹⁰ #683 Love, Submission, para 6.2. See also #319, 383 Klein.

although we note that Mr Baker, who signed the PNCC ‘Comments’ letter, expressed reservations (presumably personal) on the safe use of Kahuterawa Road and Greens Road for construction traffic, these reservations being supported by a number of submitters.

Findings

[109] Having taken account of all comments received, the Board requested MRP to make a number of amendments to further tighten up the 11 May 2011 traffic conditions as outlined in the following paragraphs.

[110] Provision be made for a number of options for construction access from Kahuterawa Road and Greens Road to respond to MRP’s indication of the possible staging of the wind farm construction and, in particular, the development of the northern turbines ahead of the development of the southern turbines.

[111] If the northern turbines are constructed as a first stage, then all construction access to be from the Pahiatua Track with access from Kahuterawa Road and Greens Road to be limited to the construction of the internal transmission line and the Browns Flat substation (if MRP includes these in this stage).

[112] Truck access from Kahuterawa Road and Greens Road to be allowed for emergencies at any time but access for site security staff, for health and safety or for environmental monitoring, to be restricted to light vehicles only.

[113] In addition to the above, for the construction of the southern turbines, truck and light vehicle access from Kahuterawa Road and Greens Road to be limited to the maximum number of vehicle movements specified in the table at Condition 67 of Schedule 3 of the final Resource Consent Conditions noting that light vehicle access is to be restricted to a maximum of 60 movements per day.

[114] For the avoidance of doubt, ‘traffic movement’ is defined as being a one-way journey along Kahuterawa Road and Greens Road as opposed to a return journey.

[115] We have noted¹¹ that, in addition to normal residential traffic, at weekends and on statutory holidays, Kahuterawa Road is used by recreational users, many of whom will be visitors and therefore unaware of the hazards posed by construction traffic. While this has been acknowledged by MRP in the restrictions on the use of these roads by construction traffic, the provision for additional light vehicle traffic between the hours of 12:30pm and 1:30pm to be removed and covered by the 10 light vehicle movements per day exception.

[116] These amendments, itemised in detail at paragraph 7 of Chapter 20, have all been incorporated in the final set of approved Resource Consent Conditions attached to this Final Report.

¹¹ Chapter 14, para 93.

Chapter 15: Noise

Introduction

[1] Like landscape and visual amenity effects, the issues around noise and the noise-related effects from the turbines were among the most substantial before us. The noise experts met on a number of occasions as the hearing progressed in an endeavour to reach a consensus on how noise from the wind farm should be managed and controlled. Eventually a consensus was reached by the experts from MRP and PNCC although this did not include the experts representing TAG and Huatau Marae.

Palmerston North City District Plan

[2] The PNCC District Plan addresses both construction noise and wind farm noise.

[3] Starting with construction noise, Clause 1(e) of the District Plan Rule R6.2.6.2 Exclusions from Noise Control Rules states:

Sounds generated by construction, maintenance and demolition activities, and, additionally, sounds generated by soil conservation and river control works carried out or supervised by the Manawatu – Wanganui Regional Council in the Flood Protection Zone, shall be assessed, predicted, measured, managed and controlled by reference to New Zealand Standard NZ6803: 1999 Acoustics – Construction Noise.

[4] For wind farm noise, District Plan Rule R6.2.6.2 Exclusions from Noise Control Rules, paragraph 1(e) states:

Sounds generated by wind farm activities in the Rural Zone shall be assessed, predicted, measured and controlled by reference to New Zealand Standard NZ6808:1998, Acoustics – The Assessment and Measurement of Sound from Wind Turbine Generators.

[5] The only other reference in the PNCC District Plan to wind farms is in Section 9, Rural Zone, where Rule R9.9.2 sets out the objectives and policies with respect to wind farms. It reads as follows:

Sawmills, Rural Industries and Wind Farms are Discretionary Activities (Unrestricted).

In determining whether to grant consent and what conditions if any to impose, Council will in addition to the City View objectives in section 2 and the Rural Zone objectives and policies, assess any application in terms of the following further policies.

In the case of wind farms, the largely unknown effects of the activity mean that it is essential that it be examined on a case by case basis.

[6] Mr Lloyd, an expert witness for PNCC, identified that the District Plan normally sets a high degree of noise protection in any event with a 40dBA L_{10} limit at the site boundary in the Rural Zone.¹

[7] Noise standards for the Tararua District are set out in Section 5.4.1.2 of its District Plan. In particular, 5.4.1.2(b) defines the noise limits for all activities in the Residential, Settlement and Rural Management Areas, with the only exclusions being for bird scaring devices, forestry activities and temporary military activities. The limits are:

7.00am to 7.00pm daily 55dBA (L_{10})

7.00pm to 7.00am daily 45dBA (L_{10}) and 75 dBA (L_{max})

These noise limits are not to be exceeded at the boundary of any site used for residential activities, or in the Rural Management Area at a “notional boundary” which is 10 metres from the facade of the nearest dwelling house on land held in a separate certificate of title. If the complainant’s dwelling house is on the same certificate of title, the noise limit applies at a notional boundary which is 10 metres from the facade of the complainant’s dwelling house.

[8] The Tararua District Plan contains no specific provisions for controlling the noise from wind farms. Instead, with relevance to *Turitea*, Section 5.4.1.3 of the Plan requires that where an activity cannot meet the specified standards, the activity shall be deemed to be a discretionary activity requiring a resource consent. The Plan goes on to require the resource consent application to include a noise report from an acoustic engineer which assesses the effect of the proposal on the locality having regard to background noise levels; the assessment of the best practicable option (BPO) in relation to noise and the activity concerned; and details of the mitigation measures proposed.

[9] Section 5.4.1.5 *Criteria for Assessment* goes on to say that regard must be given to the existing background sound level in the area concerned; whether there will be any significant adverse effect on levels of amenity of environmental quality of surrounding areas; the ability to undertake noise reduction measures at a later date when the nature of changing adjacent activities may require lower noise levels to be met; and any recommendations in a report of an acoustic engineer or other relevant professional.

Submitters

[10] The uncertainty around noise effects from the wind farm is of extreme concern to many submitters, with requests going as far as suggesting that MRP be required to stop the turbines at night if sleep was interrupted. In addition, the continuous nature of the noise was highlighted by many who considered that it

¹ Lloyd, NOE 1776.

would affect their daily lives as they liked to spend time outdoors, working on their property, or simply enjoying nature.

[11] Low-frequency noise was an additional concern frequently mentioned, with some submitters believing that the effects of low-frequency noise are unknown and that this kind of noise can be felt, not just heard. The noise incidents reported at *Project West Wind* became part of this conversation as did the many articles and papers on the effects of special audible characteristics (SAC) of wind farms and their adverse effects on communities.

[12] A small number of submitters also believed that past complaints about wind farms have been dismissed, or that residents have been paid off by wind farm companies so as not to highlight their experience of adverse effects.

[13] Possible health effects from noise were also raised by submitters and included:

- sleep deprivation;
- migraines caused by sensitivity to light and strobe effects;
- epilepsy leading on from strobing;
- stress;
- cardiovascular conditions;
- mental illness; and
- social behaviour effects.

[14] We respond to these health concerns in Chapter 16 of this report.

Issues

[15] There were many issues on noise which were finely debated against a background which included:

- the proximity of the wind farm to many residents and the concerns of these residents over the noise from the turbines, and for some the noise of heavy construction traffic accessing the site from quiet country roads;
- the release towards the end of the hearing of the updated New Zealand Standard, NZS6808:2010 Acoustics – Wind Farm Noise New Zealand, replacing NZS6808:1998 (for the earlier part of the hearing this new standard had been in draft as DZ6808);
- an understanding of SAC turbine noise, its effects, and whether this type of noise can be anticipated to occur at *Turitea*;
- concern about noise complaints from other new wind farms, particularly at *Project West Wind* at Makara, near Wellington, and whether these might be repeated at *Turitea*;

- the consideration of what are classified in the new noise standard as high amenity areas and whether there should be added protection from wind farm noise when background noise levels are low;
- consideration of the progressive refinement of noise predictions and measurements from those incorporated in the experts' evidence; to those which will be calculated after the completion of the final design; to those which will be measured in the field as the turbines are progressively installed;
- the impact of MRP's redesign of the wind farm;
- the potential for cumulative effects of noise from *Turitea* and the adjacent *Te Rere Hau* wind farm;
- the enormity of the task of undertaking background sound monitoring at each of the dwellings within the 35 decibel (dB) contour which is required under NZS6808² (for the original design, Mr Baker, the chief planner for PNCC, estimated that there were 256 dwellings (and 106 potential dwelling sites) within 3 kilometres of the wind farm with Mr Hegley's guesstimate being 300 dwellings);³
- the proposed noise conditions if consent is to be granted;
- the monitoring of noise post-construction and the speed and nature of responses to resident complaints particularly if there is non-compliance.

[16] The effect of construction traffic was another issue raised. It was considered that this would cause noise (as well as dust) and would also inconvenience residents (the safety effects of traffic are discussed elsewhere). One submitter considered that the noise effects of construction traffic would affect her ability to sleep during the day if she had been on midwife duties at night; and that this could lead on to long-term effects on her health.⁴

Experts

[17] During the course of the hearing we heard from a range of experts. These were Mr Nevil Hegley, a principal of Hegley Acoustic Consultants (HAC), and Mr Chris Day of Marshall Day Acoustics (MDA) for MRP; Mr Nigel Lloyd for PNCC; Dr Robert Thorne for TAG, FOTR and Huatau Marae and Dr Jeremy Trevathan, the author of the s42A Report for the Board. We also heard submissions from Dr Stephen Chiles, who was the chair of the New Zealand Standards Committee that developed the new NZS6808, Professor Dickinson, a member of that committee, and Mr Paul Botha, Wind Technical Strategy Manager for Meridian Energy, who described the noise problems which had arisen at *Project West Wind* and Meridian's response to these. These three witnesses were subpoenaed by the Board.

² Lloyd, EIC para 15, citing HAC, SOE para 69.

³ Hegley, NOE 3543.

⁴ #536 Adams R, Submission, NOE 2313.

Evidence and Discussion

Construction Noise from Turitea

[18] Starting with construction noise, Mr Hegley noted that noise effects will arise from:

- the construction of the internal roading network, the erection of the turbines and construction traffic on the internal site roads and the public roading network;
- noise from temporary support works, which includes a concrete batching plant and possible helicopter use.

[19] Mr Hegley concluded from his predictions of construction and construction traffic noise that:

- while noise will be heard, at all times it will be well within the requirements of NZS6803:1999 Acoustics – Construction Noise;
- construction will be undertaken infrequently at night (eg, during particularly lengthy concrete pours) and these night-time construction activities will comply with the lower night-time noise limit from NZS6803 of 45dBA L_{eq} for any activity at the closest dwelling thus ensuring there will not be sleep disturbance for the residential neighbours.

Wind Farm Terminology

[20] Having addressed construction noise, at this point we consider that it would be helpful to describe the meanings of a number of the wind farm terms referred to in this chapter and, in particular, noise sensitive locations, SAC and high amenity areas.

Noise Sensitive Locations

[21] NZS6808, at 5.1.2, states:

- To provide a satisfactory level of protection against sleep disturbance, this Standard recommends a limit of wind turbine sound levels outdoors at noise sensitive locations of 40 dB $L_{A90(10min)}$.

[22] The Standard, at 7.1.4, also states:

- Background sound level measurements and subsequent analysis to define the relative noise limits should be carried out where wind farm sound levels of 35dB $L_{A90(10min)}$ or higher are predicted for **noise sensitive locations** ... If there are no noise sensitive locations within the predicted wind farm sound level contour then background sound level measurements are not required.

[23] At Section 2.4, the Standard defines noise sensitive locations as follows:

- Noise sensitive locations include:
 - (a) Any part of land zoned predominantly for residential use in a district plan;
 - (b) Any point within the notional boundary of buildings containing spaces defined in (c) to (f);
 - (c) Any habitable space in a residential building including rest homes or groups of buildings for the elderly or people with disabilities, papakainga and marae, excluding habitable spaces in buildings where the predominant activity is commercial or industrial. (Residential buildings designed for permanent habitation on land zoned for predominantly rural or rural-residential use are not classified as commercial or industrial for the purposes of this Standard);
 - (d) Teaching areas and sleeping rooms in educational institutions, including public and private primary, intermediate, and secondary schools, universities, polytechnics, and other tertiary institutions;
 - (e) Teaching areas and sleeping rooms in buildings used for licensed kindergartens, childcare, and day-care centres; and
 - (f) Temporary accommodation including in hotels, motels, hostels, halls of residence, boarding houses, and guest houses.

[24] As noted earlier in this chapter, there are a large number of noise sensitive locations (primarily existing residential buildings) within the predicted $35dB_{LA90(10min)}$ contour.

Special Audible Characteristics

[25] A description of low frequency sound levels known as special audible characteristics (SAC) and the way in which permitted sound levels are adjusted if these are detected are set out in Clause 5.4 of NZS6808:2010:

- 5.4.1 Wind farms shall be designed so that wind farm sound does not have special audible characteristics at noise sensitive locations. However, as special audible characteristics cannot always be predicted, consideration shall be given to whether there are any special audible characteristics of the wind farm sound when comparing measured levels with noise limits.
- 5.4.2 Wind turbine sound levels with special audible characteristics (such as, tonality, impulsiveness, and amplitude modulation) shall be adjusted by arithmetically adding up to +6dB to the measured level at a noise sensitive location (see 5.4.3). This adjustment is a penalty to account for the adverse subjective

response likely to be aroused by sounds containing such characteristics.

- 5.4.3 Assessments for special audible characteristics shall be conducted in accordance with Appendix B. Cumulative adjustments for multiple special audible characteristics shall not be made to any single 10-minute sample, so an adjustment shall not exceed +6dB regardless of how many different special audible characteristics exist during a sample.⁵

[26] Appendix B referenced in Clause 5.4.3 sets out alternative methods for testing for SAC. For the avoidance of any doubt which might arise during the actual testing and the subsequent interpretation of the results of this testing, we consider that the specific method to be adopted for *Turitea* should be included in the conditions of consent.

High Amenity Areas

[27] NZS6808:2010 identifies that a 'high amenity area' should be considered when a plan promotes a higher degree of protection of residents' amenity related to the sound environment of a particular area – for example, at the bottom of a valley, but not, for example, where background sound levels are affected by road traffic sound.

[28] A high amenity area should only be applied and can only be maintained under wind conditions when low background sound levels are common at noise sensitive locations, while the wind farm is operating. The Standard recommends that the high amenity noise limit should apply when the wind farm speed is 6m/s or lower.

[29] One of the conditions agreed to in the final noise caucusing by Messrs Hegley, Lloyd and Day (which we return to discuss later in this chapter) was clause 3.2, which states:

Notwithstanding section 5.3.1 of the new standard all residential and rural areas in Palmerston North district plan are available for assessment as high amenity areas despite the absence of explicit recognition of them as high amenity areas in the district plan.

[30] Counsel for MRP rightly raised this clause with Dr Chiles as it runs contrary to what is stated in NZ6808:2010. Dr Chiles responded that the 'high amenity' issue was one of the most contentious in the standard and while to him it was 'something of a sideshow' he identified that a high amenity area has to be 'specifically identified in the district plan, that the limit is for amenity not health, and that it is intended to provide for additional aural protection to residents from wind farm noise'.

⁵ Hegley, NOE 3526.

[31] The difficulty we have with the noise consultants' approach (and it was signalled during the hearing) is that the high amenity area provision in NZS6808:2010 effectively cannot apply unless it has been adopted into district plan provisions. The conditions under which a high amenity noise limit in NZS6808:2010 is to be applied is referenced back to Clause 5.3.1, which states:

5.3.1 A high amenity noise limit should be considered where a plan promotes a higher degree of protection of amenity related to the sound environment of a particular area, for example where evening and night-time noise limits in the plan for general sound sources are more stringent than 40 dB $L_{Aeq(25min)}$ or 40 dBA L_{10} .

[32] There are no high amenity areas defined in the current PNCC District Plan and to the best of our knowledge none exists in the Tararua District Plan.⁶ If, at some future date, plan changes were to be promoted for the *Turitea* foothills to be rezoned as a high amenity area, it is possible that wind farm operators, rural businesses, the farming community and commercial operators would most likely oppose such a proposal. Even if such a proposal was finally approved, this would inevitably take many years with the high probability of appeals to the Environment Court.

[33] Counsel for the PNCC doubted in his closing submissions whether NZS6808:2010 is 'at all' an improvement for potentially affected residents.⁷ He submits:

- it is certainly a retrograde step for Palmerston North residents in areas with low background noise levels since the district plan does not identify such areas as high aural amenity areas;⁸
- aural amenity is only one component of overall amenity and it can apply in highly populated areas as well as rural ones.

Secondary Noise Limit

[34] Mr Day pointed out that the *Turitea* site is located in the Rural Zone, which is Palmerston North's production zone. Normal rural activities include aircraft for spraying, cattle, tractors and machinery, with these activities often starting early in the morning (4:00am in summer). He considers it is misleading to say that this is a quiet site just because it is next to the Tararua Ranges with the majority of surrounding areas being remote from significant roads or industrial activity. He notes this is confirmed by Mr Hegley's ambient noise measurements which show that for some positions, the ambient noise levels are relatively high.

[35] In contrast, Mr Lloyd points out that wind farm noise is different from other noisy activities – it is both generated and spreads over a wide area, and is difficult for residents to escape from – it is continuous noise.⁹

⁶ Baker, NOE 3874.

⁷ Maassen, Closing Submission for PNCC, p31.

⁸ Unlike the Wellington District Plan which does.

[36] At the first part of the hearing neither Mr Hegley nor Mr Day believed that a lower sound limit was required when there was low background sound.¹⁰ Mr Lloyd disagreed. In his opinion for *Turitea*, a secondary noise limit is required to protect a very large number of residents at times when background sound levels are below 25dBA and the wind farm noise is 10dB greater than this background sound level. ‘This is when noise will be unduly audible to residents.’

[37] We return later to this issue of a secondary noise limit when we discuss the outcomes caucusing which took place among the experts.

Wind Farm Noise Modelling

[38] Mr Hegley advised that HAC had measured the noise environment over a minimum of 10 days at 16 representative sites around the north, west and east of the proposed wind farm in terms of the requirements of NZS6808:2010. The locations of these 16 representative sites are shown in Figure 2 of Mr Hegley’s evidence-in-chief.

[39] In addition, Mr Hegley advised that wind farm noise predictions were undertaken based on a VestasV90 turbine which has the maximum power rating for a 3MW turbine and/or the largest noise profile for the turbines being considered for *Turitea*. The Vestas turbine has the following specifications:

- a maximum turbine hub height of 80 metres;
- a maximum rotor blade length of 45 metres;
- a maximum height to top of blade of 125 metres.

[40] Mr Hegley noted that the predictions were based on the wind blowing directly towards the receiver position, for the original design for a maximum of 122 turbines and for the redesign, 105 turbines.¹¹

[41] From his predictions, Mr Hegley concluded that:

- the wind farm will be able to operate within the noise requirements of PNCC’s District Plan and the requirements of NZS6808:2010;
- resource consent is necessary (and has accordingly been applied for) with respect to the noise requirements of the Tararua District Plan (which does not identify NZS6808:2010 within the provisions of its plan);
- for the redesign, the predicted noise effects of the original proposal have been substantially reduced as a result of a combination of the smaller area contained within the 35dBA contour and recent improvements to the design of the V90 turbines;

⁹ Lloyd, EIC para 32.

¹⁰ Lloyd, para 16, p16, citing HAC SOE para 7.16, and MDA SOE Report Attached, para 5.5.

¹¹ Hegley, EIC para 8.26.

- if SAC did occur, there would need to be a noise penalty as there would be non-compliance at many locations.¹²

Cumulative Effects with Te Rere Hau Wind Farm

[42] For one family, the noise from *Te Rere Hau* is reported as being ‘unbearable’ – ‘a low droning noise inside making it difficult to sleep’. For another, ‘the noise levels are particularly noticeable when the wind blows easterly through to southerly and is discernible at very low wind velocities’ – and so on.

[43] Through Mr Lloyd, the Board received Exhibit 23 entitled *Te Rere Hau Complaints* dated 29 July 2009. Then Exhibit 40 was tabled which detailed 317 noise complaints from the PNCC’s *Te Rere Hau Complaints Database*.

[44] It was not surprising therefore that some residents who are located between *Turitea* and *Te Rere Hau* have expressed considerable concern about the potential effects of simultaneous noise from both wind farms.

[45] Mr Hegley has identified a series of sites referenced as Noise Monitoring Points (NMPs) which are located at the notional boundaries of the closest dwellings and points of interest as shown on Figure 42 of his evidence-in-chief. These NMPs have been used as the locations for predicting sound levels from the operation of the wind farm.

[46] He advised that his modelling demonstrates that it will be *Te Rere Hau* which controls the noise contour for the residents who live between the two wind farms. As an example, for NMPs 27, 28, 64 and 95, *Te Rere Hau* totally controls the noise received, while at NMPs 25 and 26 it has a significant influence on the noise received. For NMPs 23, 24, 61 and 96, *Te Rere Hau* also makes a noticeable contribution to the noise received (with the modelling based on the scenario that the wind is blowing towards the receiver from every turbine at once). He points out that, in reality, this is an impossible scenario, as the wind can only blow from one particular direction at any given time.

[47] With particular respect to the Huffman/Devey property¹³ (at NMPs 24 and 25 and which was identified as one of the most potentially affected properties), in a north-easterly wind, the noise received will be predominantly from *Te Rere Hau* with only a minor contribution from *Turitea*, with the respective contributions reversed in a southerly wind. Both of these wind conditions are uncommon occurrences as shown in the wind rose at Figure 3 of Mr Hegley’s evidence-in-chief. But the prevailing wind will blow noise from both the *Te Rere Hau* and *Turitea* wind farms away from the Huffman/Devey property. Mr Hegley therefore contends that this location will receive minimal noise from either wind farm during prevailing wind conditions. Further, in Mr Hegley’s opinion, there is no other wind condition that will result in an accumulation of noise from both wind farms at the Huffman property.

¹² Hegley, March 2010, para 23.

¹³ #317, #664, Devey/Huffman NOE, 2576, 3378.

[48] A submitter, Dr Richard Harker, disputes the validity of the data contained in the wind rose graphic used by Mr Hegley to support his claim that the wind hardly ever blows from the south east. Dr Harker contends that the correct interpretation of the wind rose would show that the wind from the south east constitutes a substantial secondary mode of over 30%.

[49] We were left unsure of the potential consequences arising from the differences in the wind rose interpretation between Mr Hegley and Dr Harker but consider that these should be able to be established as part of the noise prediction testing which has been provided for in the approved conditions of consent.

[50] Mr Lloyd identified that Mr Hegley had found the *Te Rere Hau* wind farm exhibits SAC and that it might be that *Te Rere Hau* is generating noise levels that do not allow further wind farm noise (such as from *Turitea*) to be introduced. Mr Hegley made the point in his rebuttal evidence that it is not MRP's business to monitor another wind farm's tonal effects:

The *Te Rere Hau* turbines are a two blade design and the current turbines have a tonal component to them that attracts a 5dBA penalty due to the special audible characteristics of the sound. The proposed turbines at *Turitea* are three blade turbines without any tonal component so any direct comparison with the different types of turbines should not be made.

It has been suggested that as the existing turbines at the *Te Rere Hau* wind farm exhibit a "tone" this should be included in the analysis of cumulative noise effects that may be received by the residents (paragraph 20). I understand the wind turbine manufacturer supplying the *Te Rere Hau* turbines is addressing this issue and has eliminated the tonal component of the turbines at 502Hz, 756Hz and 1220Hz (in accordance with the requirements of IEC 61400-11-2002 Wind Turbine Generator Systems – Part 11: Acoustic noise measurement techniques). There is another tone, which is at 996Hz, and this has been noticeably reduced to only 2 – 3dB above the tonal criterion. Given that it is incumbent on the *Te Rere Hau* wind farm to correct the tonal effect, it is not appropriate for Mighty River Power to be required to model that tonal effect.¹⁴

[51] The significance of this piece of information is that SAC incorporating tonal components may become corrected for *Te Rere Hau*.

[52] Overall, based on the noise modelling undertaken so far, it is Mr Hegley's opinion that there are no wind conditions that will result in any significant cumulative noise effects from the two wind farms. But in order to respond more fully to residents' concerns, Mr Hegley made recommendations around further noise conditions to ensure that any potential cumulative noise effects are adequately considered and responded to. We note that these have come through into the draft final conditions proposed by the experts which we discuss later in this chapter.

¹⁴ Hegley, RE 5.1.

The *Project West Wind* Experience

[53] It became quite evident during the course of the hearing that many of the submitter concerns on noise had been triggered by the noise issues which had arisen at Meridian Energy's *Project West Wind*. We therefore include here some background on *Project West Wind*, the noise problems which have occurred, the identification of the reasons for these problems and the corrective actions subsequently taken by Meridian. This background was provided primarily by Mr Botha when he made his submission to the Board. In addition, we also heard on these *Project West Wind* problems from Mr Lloyd who was the noise expert for Wellington City Council, and Dr Thorne, who was the noise expert for the *Project West Wind* community group, Makara Guardians.

[54] During the course of the Environment Court hearing for *Project West Wind*, Dr Thorne had concluded that there was a high probability that SAC from the turbines would cause adverse effects for residents. He described the nature of the noise the residents would hear as 'audible tones' or 'low pitched thumping'.¹⁵ In addition, the other *Project West Wind* acoustic experts had been concerned enough by the results of the high level caucusing that went on between Dr van den Berg (another noise expert called by the residents) and Mr Malcolm Hayes, a widely experienced acoustic consultant from the United Kingdom advising Meridian,¹⁶ to agree to conditions in the *Project West Wind* consent which addressed the effects of SAC should these arise. In the event, such caution was justified in that the *Project West Wind* turbines did exhibit SAC.

[55] Mr Botha told the inquiry the 2.3MW turbines at *Project West Wind* were manufactured, supplied and installed by Siemens. One of the noise conditions to the resource consent called for a noise emissions report which was prepared by Delta, a Danish monitoring company. Delta measured the noise from a Siemens 2.3 turbine in Europe and certified that there were no SAC. Once installed at *Project West Wind*, however, SAC were identified at frequencies of 50Hz, 62Hz and 119Hz.

[56] Following extensive post-installation testing, Mr Hayes and Mr Botha identified that the 50Hz tonal peak was a frequency being emitted from the generator located in the nacelle. Siemens remedied this problem by making a software setting change in the turbine converter.

[57] The 62Hz tone occurred during very low wind conditions. To reduce this tone, dynamic dampers were installed on those turbines which had direct lines of sight into Makara Valley. To reduce the 119Hz tonal peak, which occurred when the turbines reached their full rotational speed, a software change was made to the turbine control system on selected turbines to reduce the turbine's maximum rotational speed.¹⁷

¹⁵ *Meridian Energy Ltd and Others v Wellington City Council and Wellington Regional Council* [Environment Court] WO3/2007, paras 50–53.

¹⁶ Lloyd, NOE 3512.

¹⁷ Botha, NOE 3738–3740.

[58] Mr Botha was unsure as to why these SAC had occurred on the turbines installed at *Project West Wind* when they had not been identified during the Delta testing in Europe. There was some suggestion that differences in the tower design at each location may have been a factor.

[59] Some conclusions from *Project West Wind* provided by Mr Botha and Mr Lloyd were:

- following the modifications to the turbines, the night-time broadband wind farm noise levels at four of the five assessment locations now comply with the respective night-time compliance limits by a significant margin and in all these cases by more than 5dB;
- the night-time broadband wind farm noise levels at the other assessment location comply by a significant margin in all southerly wind directions, but with a minimum compliance margin in northerly wind directions of 2.2dB;
- no SAC penalty needs [now] to be applied to the measured noise levels;
- from 100 noise complaints per month received from the residents of 60 dwellings up until January 2010, the number of complaints reduced to 53 in February 2010, and 33 up until the middle of March 2010¹⁸ when the formal sittings of the *Turitea* inquiry were completed;
- most of the complaints have been from the residents who live closest to the turbines,¹⁹ although there have also been complaints from residents who live at some distance from the site of the wind farm;
- some of the complaints are simply people phoning the call centre to say they can hear noise from the turbines;
- Wellington City Council staff have spent a great deal of time in attempting to remedy the *Project West Wind* situation;
- if matters were to go the same way at *Turitea* as they have done at *Project West Wind*, the sheer size of the project over such a large interface indicates that the number of noise complaints could make it very difficult for PNCC to respond;
- the *Project West Wind* requirement that the wind speed measurement be taken at the residential dwelling of the complainant is cumbersome;²⁰ in the revised version of NZS6808:2010 wind speed is measured at the wind farm site;²¹
- the *Project West Wind* conditions are complex and having a simpler set such as those proposed for *Turitea* might actually have

¹⁸ Botha, NOE 3743.

¹⁹ Ibid, 3743.

²⁰ Ibid, 3757.

²¹ Ibid.

helped the Makara community²² – such as quicker response times to residents’ concerns;

- *Turitea* should have, as a condition of consent, the requirement for three dedicated data logging machines to allow the monitors to assess if SAC or noise modulation are present as it was these noise effects which caused the most disturbance to the Makara residents.

Progressive Assessments and Measurements of Noise

[60] Both Dr Trevathan and Mr Lloyd agreed that measurements post-commissioning should *not* be used as the only method to verify noise levels.²³ Dr Trevathan’s report contained advice as to how noise predictions should be assessed at the detailed design stage. This became significant for the Board because it was Mr Hegley’s clear evidence that, at the consent stage of a project, ‘insufficient detailed information is available to provide comprehensive predictions’.²⁴

[61] Mr Lloyd proposed that the conditions of consent include the following provisions:

Because MRP has yet to decide which turbines are to be used and the detailed design has yet to be undertaken then there should be an Acoustic Emissions Report to be provided to Council for the type of turbine to be used. The Acoustic Emissions Report should detail the sound power level of the turbines and confirm the absence of special audible characteristics.

Based on the Acoustic Emissions Report, a Noise Prediction Report should then be prepared to the satisfaction of the PNCC. This report should take the sound data for the selected turbines and use it to demonstrate that the primary and any agreed secondary noise limits will be complied with. This may be undertaken in stages as background sound data becomes available for all of the dwellings inside the 35dBA contour. The final 35dBA contour should not be determined until this stage of the project.

When the final 35dBA contour has been determined by the Noise Prediction Report, the pre-installation background sound surveys can then be completed for those dwellings where these have not already been undertaken.

It is important that the background sound levels should be separately correlated for predominant wind directions. Mr Hegley’s EIC Figure 3 shows the predominant wind direction to be northwesterly and with the other lesser wind direction being southeasterly. The correlation needs to be for both of these wind directions. While the south easterly wind is shown to be for a small percentage of the time when it does it may do so for several days at a time.

²² Botha.

²³ Lloyd, EIC para 88. Trevathan, s42A Report, paras 4.4, 14.

²⁴ Hegley, March 2010, paras 24–27.

[62] Mr Lloyd also added that it will be important for PNCC that the precise method of determining compliance be decided prior to the operation of the wind farm commencing. Starting the wind farm and *then* providing for compliance subsequently would alienate residents and make it less likely that the community would accept the noise levels once compliance was eventually achieved.²⁵

[63] Dr Trevathan supported Mr Lloyd's proposed approach as set out in his s42A Report:

I consider that these predictions should be detailed and accurate enough to allow determination of which turbines will be de-rated (if compliance cannot be achieved with unrestricted operation), by how much they will be de-rated and under what circumstances, and then that control systems be put in place so the wind farm operates under these constraints from commissioning. I do not consider it acceptable to use subsequent noise monitoring to provide feed-back as part of a trial-and-error process to confirm what controls are required. If subsequent monitoring reveals non-compliances, these should be unanticipated. If subsequent monitoring confirms that compliance is being achieved (as it should), then the Consent Holder may be able to determine the extent of any conservatism, and modify the control regime if there is sufficient 'headroom'.²⁶

Expert Caucusing

[64] Many of the original differences and difficulties among the noise experts were significantly resolved in three caucusing sessions which we have titled Caucusing (1), Caucusing (2) and Caucusing (3). We describe the evolution of the proposed noise conditions by referring to each of these three caucusing sessions.

Caucusing (1)

[65] The first caucusing session was undertaken by telephone conference on 12 June 2009, before the hearing began, among Messrs Hegley, Day, Lloyd and Dr Thorne. Dr Trevathan was still completing his s42A Report at that time and did not participate.

[66] In their joint statement from this caucusing, the experts found much common ground with the noise limits agreed by all of the experts (except for Dr Thorne) being:

- a primary noise limit of 40dBA L₉₅ or the background noise level plus 5 decibels, whichever is the higher;

²⁵ Lloyd, EIC para 88, pp23–24.

²⁶ Trevathan, S42A Report, para 4.3.

- an adjustment to the primary noise limit of 5 decibels in the event of the presence of SAC with the limit being reduced from 40dBA to 35dBA.²⁷

[67] Mr Lloyd also recommended that there should be a secondary noise limit of 35dBA L_{95} when background noise levels were low. And, further, he recommended that reference to the notional boundary of rural dwellings should include ‘any existing residentially zoned property boundary’ to account for the many residential properties within the 35dBA noise contour.

[68] The boundary condition was agreed but Messrs Hegley and Day considered that the secondary noise limit should be restricted to apply in the circumstances being contemplated by DZ6808 (later confirmed in NZS6808:2010), with particular reference to the second sentence in the following:

The secondary noise limit shall apply when background sound levels are commonly less than 25dBA (determined by means of regression analysis) between 10 pm and 7 am. The secondary noise limit shall apply for areas shown to require a higher degree of protection of amenity as set out in the relevant District Plan.

[69] As noted above, Dr Thorne had given evidence at *Project West Wind* for the resident objectors where he had been in agreement with another noise expert Dr Fritz van den Berg of Holland.²⁸ In that case, both believed that while the noise conditions agreed upon by the experts would protect residents from severe annoyance and sleep disturbance, they would not protect them from annoyance and loss of amenity. Dr Thorne therefore considers that, for *Turitea*, the noise levels should not exceed a level of 35dBA L_{eq} measured over a 10-minute period outside a dwelling or noise sensitive place.

[70] In questioning Dr Thorne, he was asked whether the new noise standard is based on an internationally accepted indoor sound level of 30dBA to protect against sleep disturbance and that this assumes a reduction from outdoors to indoors of typically 15dBA with windows partially open for ventilation. Dr Thorne responded:

A: That is, yes that is the usual guidelines.

Q: Thank you. So Dr Thorne, do you accept that the noise levels from NZS6808 are in accordance with the World Health Organisation’s guidelines for community noise?

A: With the addition to that statement of – ‘with consideration of special audible characteristics’ I will accept, I think that is a fair comment.²⁹

²⁷ Joint Statement on noise caucusing, 12 June 2009.

²⁸ Thorne, NOE 1612–5.

²⁹ Ibid, 3649.

[71] In response to further questioning, Dr Thorne conceded that for an external noise level at MP9 of 28dBA, as predicted by Mr Hegley (MP9 being the Huatau Marae and about which Dr Thorne had concerns), with a 15dBA reduction from outside to inside, the internal noise level would be only 13dBA which is less than half the World Health Organisation (WHO) recommended standard!

Developments following Caucusing (1)

[72] Following the first caucusing session, MRP undertook the redesign of the wind farm. This was partly in response to resident concerns about the potential effects of noise from the turbines, many of which were in relatively close proximity to residences. The redesign resulted in 22 turbines being removed (mostly from the slopes facing the residences) with 44 being relocated within their turbine zones.

[73] Mr Hegley re-ran his noise model for the redesign. This was undertaken in accordance with the methodology outlined in detail in his original evidence-in-chief, with the changes to the noise levels being calculated at the same monitoring points as for the original design. The results of this redesign modelling show reductions in the predicted noise levels at every assessment location with variations of between 0dBA and 10dBA and a significant reduction in the area contained within the 35dBA contour.

[74] Also following the first caucusing there were a number of other developments which we background here:

- a conference call instigated by the Board in January 2010 with the parties' legal representatives outlined our concerns about the level of noise complaints emanating from the new wind farms in Wellington and the Manawatu region (in particular *Project West Wind* and *Te Rere Hau*);
- the formal release of the revised New Zealand Noise Standard, NZS6808:2010, which came into effect as of 1 March 2010, noting that during the first stage of the hearing all parties were relying on the draft standard which had resulted in differing opinions on its meanings being expressed which complicated some issues;
- as discussed earlier in this chapter, the release by Meridian of the report authored by Malcolm Hayes of the United Kingdom and Paul Botha of Meridian about the noise complaints and SAC at *Project West Wind*;
- a revised set of noise conditions and draft Noise Management Plan NMP which Mr Day had been instructed by MRP to prepare after the judicial conference call (January 2010);
- an alternative set of proposed noise conditions and a draft NMP which had been prepared in February 2010 by Dr Thorne on the instruction of his client, Huatau Marae as a result of issues raised at the first part of the hearing and ongoing noise issues at *Project West Wind* and *Te Rere Hau* with a chief feature of these documents being proposed set-backs of a 2,000-metre prohibition

zone and a 3,500-metre buffer zone for noise mitigation within the 35dBA noise contour; a primary noise limit of 35dBA L_{eq} and a secondary noise limit of 30dBA L_{eq} for SAC.

Caucusing (2)

[75] Caucusing (2) involved a teleconference among Messrs Hegley, Day, Lloyd and Trevathan in the week before the resumption of the adjourned hearing (in March 2010) to discuss Mr Day's revised set of noise conditions and draft NMP. Dr Thorne was not available for this caucus.

Caucusing (3)

[76] Further caucusing (3) took place amongst the five noise experts on the evening of 22 March 2010 during the second part of the hearing with an Environment Court Commissioner as facilitator. At this caucus Messrs Lloyd, Hegley, Day and Dr Trevathan affirmed their agreement with amended draft conditions but agreed to disagree with Dr Thorne on 'noise limits' versus 'set back distances' as a method of noise/sound control around residential dwellings. Messrs Lloyd, Hegley and Day (with Dr Trevathan then excused) also agreed on the draft noise conditions dated 22 March 2010 together with a further draft NMP. Following a review of the drafts, Dr Thorne gave his approval to a number of the conditions, indicated a number of others were 'close' to answering his concerns, but rejected the notion that the turbines should be designed to be operated so that the wind farm sound levels should not exceed the background sound level by more than 5dBA or a level of 40dBA (L_{A90}) whichever is the greater (Dr Thorne remained with 35dBA). He also proposed a 12-month pre-installation background noise survey and penalties in the form of demerit points for non-compliance. He further expressed concerns about the long timeframe of 10 working days for the results of any assessment of residents' complaints to be submitted to council and requested a tighter time response.³⁰

[77] Dr Thorne also raised concerns over the effects of infrasound, vibration and low-frequency sound. When questioned as to what might be a reasonable noise level for each of these, Dr Thorne replied he would be looking at the psychological effects of the sound on the residents and setbacks of 1,200 to 3,000 metres. But then he stated infrasound is not a SAC and there is no agreement on its criteria, and that he would use it (modulation) only in the audible range. Further, he acknowledged that he did not know if vibration would be a problem at *Turitea*.³¹

[78] In fact, having carefully read Dr Thorne's evidence on vibration and his responses to cross-examination from counsel for MRP, we were left very confused. In the final analysis, with respect to ground vibration, we prefer the conclusions of NZS6808:2010, which states at 5.5.3 that:

³⁰ Thorne, see notes on caucusing 23 March 2010, pp1–3.

³¹ Ibid, NOE 3659.

No recommendations for assessing the potential impact of ground-borne vibration are made because such vibration is not perceptible beyond the boundary of the wind farm.

[79] We also note C5.5.3 from the standard, which states:

C.5.5.3 Building vibrations induced by incident airborne sound ('secondary vibration') can act as a new source of airborne sound as well as possibly causing rattling in building elements or of loose items such as ornaments. Rattling is known to exacerbate annoyance. Secondary vibration may occur when other sounds are also present in the environment, so a careful investigation of the source of any rattling or vibration should be made before attributing the rattling or vibration to the operation of the wind turbines. If secondary vibration is shown to relate to a wind farm this should be investigated by the wind farm operator under their duty in section 16 of the Resource Management Act.

[80] Dr Thorne's particular set of noise conditions and NMP dated January 2010 prompted a 'Second Agreement' from Messrs Lloyd, Hegley and Day the day after caucusing (3), in which they collectively found that neither of Dr Thorne's documents were in accordance with NZS6808:2010 and that the wording was difficult to understand.³²

[81] As to the setbacks which Dr Thorne suggested, Dr Chiles explained the details behind NZS6808:2010. Dr Chiles considered that the use of setbacks, as Dr Thorne suggests to control potential adverse effects, has no effects-based reasoning behind it, which is what the RMA requires. Potential effects in fact will depend on the terrain involved, turbine types and turbine layout, together with the wind conditions in a particular location.³³ We agree to a point – but note that avoidance of adverse effects from noise altogether is one method which falls within s5(2)(c) RMA but will be qualified also by an s16 BPO assessment.

[82] The Board considers that, to impose Dr Thorne's recommended condition on setbacks, it would have to be accepted that the risks are such that it required that kind of setback because essentially there would be no wind farm left – it would be tantamount to declining consent.³⁴ But also by using distance as a noise control we would have to assume something will happen when, in reality, it may not. We understand that for *Project West Wind* some residences over 4 kilometres from the wind farm site were affected by SAC whereas some closer residences were not.

³² See Document 117 *Second agreement reached at acoustic expert caucusing* (Hegley, Day and Lloyd).

³³ Chiles, NOE 3661. Other evidence from some of the acoustic consultants confirmed Dr Chiles' opinion on setbacks.

³⁴ Thorne, NOE 3657.

Response to noise complaints

[83] Dr Thorne considers turbines should be de-rated immediately if either (a) a complaint is received, or (b) noise measurements show non-compliance with relevant noise levels. He considered that such prompt action would avoid stress and anxiety such as that experienced by the residents at Makara.

[84] Mr Day is also aware that delayed responses to noise complaints are contributing to the problems currently being experienced at some wind farms. But he considers it is very important to establish first that noise levels associated with complaints are outside compliance levels before mitigation action such as de-rating turbines is instigated. He is not aware that any other industry in New Zealand is subject to noise conditions allowing the industry to be shut down based on the receipt of complaints alone.

[85] He pointed out the reality of determining non-compliance requires noise data to be collected and analysed to determine a regression curve that is compared with the noise limit curve. Clause 7.2.1 of NZS6808:2010 suggests 10 days of continuous monitoring is required to give a suitable range of data (over 1,440 data points). Any compliance assessment therefore requires significant time to carry out the specified monitoring procedures. Mr Day, does, however note, that for *Turitea* this process will be expedited with the proposed provision of continuous noise monitors.

Professor Dickinson's Submission

[86] Professor Dickinson is a professor at the College of Sciences at Massey University and was a member of the New Zealand Standards Committee responsible for preparing the 2010 version of NZS6808. We were advised that, while he sees the standard as an improvement on the earlier standard, he voted against its release. Professor Dickinson's position is generally as set out in his paper *Nonsense on Stilts*. This paper was published in the Proceedings of Acoustics 2009 and presented to the Acoustics 2009 Conference in Adelaide, Australia, prior to the release of the Standard. In the Abstract to his paper, Professor Dickinson writes:

New Zealand Standard 6808 on noise from wind turbines has been reviewed and a new draft standard produced for public comment. The draft differs little from the existing standard and closely follows that used in Britain and parts of Europe, even though there are clear indications that the criteria to be met do not fully conform with World Health Organisation recommendations, and the methodology used is likely mathematically, scientifically and ethically wrong. The draft and similar standards across the world are clearly biased towards wind farm development for as little cost as possible, and it appears public health concerns are not being given enough attention.

[87] We invited Professor Dickinson to the hearing to speak to his opinions as set out in his paper (see paragraph 17 of this chapter). In brief, the key issues raised by Professor Dickinson were:

- the instrumentation used by noise consultants in New Zealand for unaccompanied noise monitoring may not truly measure background sound levels and may not have a sufficiently low noise floor;
- the wind at the microphone may distort noise levels;
- the level of sound attenuation from the outside to the inside of a building may be a lot less than the 10 to 15dBA assumed by the standard, thereby affecting sleep patterns;
- some residents may elect to sleep outside on their verandas where there will be no noise attenuation;
- the background sound levels in rural areas of New Zealand are extremely quiet and a sound level of even 35dBA outside of a residence can be very noticeable;
- the sound level from any industry should be restricted to 30dBA at the boundary of a rural property;
- noise levels can be expected to increase by up to 10dBA through turbine wear and tear;
- taking all of the above into account, an easy solution would be to restrict noise levels to 30dB ($L_{Aeq,10mins}$) at any residence or 20dB ($L_{Aeq,10mins}$) in total in the frequency bands 31.5 to 125Hz;
- alternatively, wind farms should not be constructed within 10 kilometres of any dwelling unless agreed to by the occupant of that dwelling.

[88] We weighed up Professor Dickinson's opinions against those of the other experts we heard from during the course of the hearing. Key amongst these are the level of sound attenuation from the outside to the inside of residential buildings; the sound effects on people electing to sleep on verandas; the proposed 30dBA restriction on sound level at the boundary of a rural property; any allowance for increases in noise levels from turbine wear and tear; and the proposition that wind farms should not be constructed within 10 kilometres of any residential dwelling.

[89] We acknowledge the advice from Dr Chiles who told us that tests undertaken on a typical residential building in New Zealand had confirmed an attenuation of at least 10dBA from outside to inside. We note and accept that this supports the provision allowed for in the standard.

[90] Most people elect to sleep indoors and it would be far too restrictive to set noise conditions for a very small number who may elect to sleep outside on the odd occasion.

[91] We have noted that there is a high amenity noise limit in the new standard for times of low background noise. We note that this same limit (35dBA_{L95}) has been proposed by the noise experts (apart from Dr Thorne) as the secondary noise limit to apply at *Turitea*. Based on our consideration of all of the evidence, we accept that 35dBA is the secondary noise limit that should apply, with 40dBA at other times.

[92] Turning to a noise penalty to allow for turbine wear and tear, apart from the proposition in Professor Dickinson's paper, we have been unable to find any other reference for making an allowance for such an effect. If additional noise did arise from the wear and tear on a turbine, we suspect that this would be symptomatic of a poorly performing turbine and that it would also most likely trigger non-compliance with the noise conditions. For both reasons, there would be an incentive for the operator to take urgent corrective action to remedy the cause of the problem so as to maintain full energy production from the turbine. We do not see it to be necessary to impose a noise penalty in the expectation that a wear and tear event might arise and that the operator would fail to respond. It appears tenuous.

[93] We have addressed the issue of setbacks when we considered a similar proposal from Dr Thorne. We do not need to repeat that here.

Findings

[94] Starting with construction noise, Mr Hegley advised that the wind farm can be constructed in compliance with NZS6803:Acoustics – Construction Noise. This was not disputed and we accept his findings on this. We also accept the provisions on *Acoustic Matters – Construction Noise* contained in the MRP 28 March 2010 Resource Consent Conditions.

[95] Turning to the noise from the operation of the wind farm, a large number of submitters we heard from live in the foothills of the Tararua Ranges near to the wind farm. Their apprehensions on wind farm noise have not been helped by the problems which have occurred at *Project West Wind* and *Te Rere Hau*.

[96] Most of the evidence we heard on this noise was set against the background of NZS6808, the New Zealand standard on the acoustics of wind farm noise. As we have noted, the current version of this standard, NZS6808:1998, was under revision as a draft, DZ6808. On 1 March 2010 just prior to the commencement of the second part of the hearing, the new version NZS6808:2010 was released. This was referred to extensively in the final joint statements of the noise experts. None of the parties to the hearing expressed any opposition to adopting the revised standard for *Turitea* and nor do we. In fact it seems eminently correct that the latest version should apply.

[97] In its Foreword, NZS6808:2010 says:

Wind farm sound may be audible at times at noise sensitive locations, and this Standard does not set limits that provide absolute protection for residents from audible wind farm noise... and ...

The consensus view of the committee provides a reasonable way of protecting health and amenity at nearby noise sensitive locations, without unreasonably restricting the development of wind farms.

[98] NZS6808 also states, at Section 1.2:

The noise limits in the Standard provide a reasonable rather than an absolute level of protection of health and amenity.

[99] Mr Lloyd also made the point that the purpose of NZS6808 is to protect amenity to the degree when a great majority of people are not annoyed. But ‘it will allow for a small percentage of people [to be] more sensitive to noise. Some annoyance will remain but the aim is, on the Bellcurve, to pick up in 80% or 90% of the population and ensure they are not severely annoyed’.

[100] For our part, whilst we acknowledge that we are not bound by what NZS6808:2010 says, the point remains that different individuals have different noise sensitivities. Irrespective of what noise conditions may be imposed for *Turitea*, noise from the wind farm will be audible to varying degrees in the surrounding environs. In addition, many noise sensitive locations will remain within the predicted 35dBA contour under the redesign. Even with a possible further reduction in the area contained within the 35dBA contour as a result of the removal of the additional turbines which we have declined, the number of noise sensitive locations will still be very large.

[101] In this context, we are drawn to Mr Lloyd’s summary of the special nature of the *Turitea* wind farm:

- (a) the location is next to the currently quiet Tararua Ranges and the majority of surrounding areas are remote from significant roads or significant industrial activity;
- (b) people come to such areas to escape from the close confines of residential or urban living; these people appreciate the aural amenity that is generally the quietness and peacefulness of the area (given that rural noise can be high from time to time);
- (c) wind farm noise is different from all other noisy activities in that it is generated over a wide area and spreads over a wide area of the surroundings – it is difficult to escape from.³⁵

[102] Creating an environment where wind farm noise will be clearly noticeable at times of quiet background sound levels is not an option we condone, especially where large numbers of residents are affected. Energy operations in New Zealand will have to learn not to place wind farms so close to residential communities if they are not prepared to accept constraints on noise limits under such conditions.

[103] We have not gone so far as to accept the evidence of Dr Thorne and Professor Dickinson on their proposed primary and secondary noise limits as well as the proposed provision of minimum setbacks. We have already given our reasons for preferring the evidence of the other experts on these matters and we do not repeat these here.

³⁵ Lloyd, EIC paras 31–32(a), (b), (c), (d).

[104] We are very much aware of the concerns of residents that the problems which occurred at *Project West Wind* could be repeated at *Turitea*. The root cause of these problems was that following their installation, the *Project West Wind* turbines exhibited SAC even though these had not been identified during the prototype noise testing at the turbine manufacturer's production plant. The proposed noise conditions for *Turitea* contain specific provision for independent noise testing for SAC at the manufacturer's plant as well as progressive field testing as the turbines are installed. This field testing is structured to identify and rectify any SAC (if a SAC should occur) soon after the installation of individual or groups of turbines, as opposed to delaying testing until the whole wind farm has been completed. We commend this approach.

[105] We were provided with a document titled *Acoustic Matters – 23 March 2010* which set out the agreements eventually reached among Messrs Hegley, Day and Lloyd (but not Dr Thorne) on the noise conditions and NMP proposed for *Turitea*.³⁶ In addition, the MRP 28 March 2010, Resource Consent Conditions also contained proposed noise conditions and a draft NMP.

[106] We noted in our Draft Report that not all of the 23 March conditions agreed by the experts had been taken forward to the MRP 28 March document. In particular:

- Clauses 3.1 and 3.2(b) and (c) of the experts' conditions require that reduced noise limits should apply between the hours of 10:00pm to 7:00am for locations with low background sound levels as would apply as if these were classified as high amenity areas under C5.3.1 of NZS6808.

[107] As noted in her closing legal submission, counsel for MRP advised that MRP disagreed with this proposed condition unless the locations referred to were classified as high amenity areas defined in the relevant district plan. Currently, no such provision exists in the PNCC District Plan.³⁷

[108] Whilst we acknowledge that there are no high amenity areas defined in the current PNCC (or Tararua District) Plans, we nevertheless support the findings of the experts that a secondary noise limit should apply at times of low background sound levels.

Noise Conditions and Noise Monitoring Plan

[109] With reference to the proposed noise conditions and the draft NMP set out in the experts' 23 March document, in our Draft Report we signalled our general agreement with the provisions of these documents as drafted in preference to the conditions included in the MRP 28 March 2010 Resource Consent Conditions. In doing so, we acknowledged that, as they were put together by the experts in something of a hurry to meet a very tight deadline during the second part of the hearing, some fine tuning was required.

³⁶ Document #115.

³⁷ Price, MRP Closing Submission, para 4.56.

[110] We were unclear as why most of the provisions contained within the draft NMP of this document were not identified as noise conditions. It is our view that, unless there are very good reasons, all of these NMP provisions should form part of the Noise Conditions. Accordingly, in our Draft Report we requested MRP to redraft the document to suit. In doing so, we requested that account should be taken of the following specific comments (with reference to the document as currently drafted).

Noise Conditions

- Conditions 3.1(a) to (c) and 3.2 should be replaced by:
 - (a) Except for times when the wind farm wind speed and background noise levels are such as to trigger a secondary noise limit, the turbines shall be designed, constructed, operated and maintained so that the wind farm sound levels ($L_{a90(10min)}$) shall not exceed the background sound level by more than 5dB, or a level of 40dBA($L_{a90(10min)}$), whichever is the greater;
 - (b) Where the wind farm wind speed is 6m/sec or lower, a secondary noise limit shall apply under which the turbines shall be designed, constructed, operated and maintained so that wind farm sound levels ($L_{a90(10min)}$) shall not exceed the background sound level by more than 5dB, or a level of 35dBA ($L_{a90(10min)}$), whichever is the greater;
 - (c) This secondary noise limit shall apply only between the hours of 10:00pm to 7:00am.
- Condition 3.3 should be renumbered as 3.2.
- Condition 6.1: This section should be modified to include the detail of the noise prediction and measurement processes proposed by both Mr Lloyd and Dr Trevathan reproduced in this chapter of our report in the section titled 'Progressive Assessments and Measurements of Noise'. This includes both primary and secondary noise compliance.

[111] In addition, Appendix B of NZS6808:2010 sets out alternative methods for testing for SAC. For the avoidance of doubt which might arise during testing for these SAC and the subsequent interpretation of the results of this testing, we requested that the noise conditions (as opposed to the NMP) should define the specific method to be adopted for SAC noise testing for *Turitea*.

NMP

- NMP 1.1(b): this defines 'contributing turbines'. We could find no other reference in the Noise Conditions or NMP to 'contributing turbines' – this is important and needs to be taken forward for specific application within the Noise Conditions;
- NMP 3.1: this provides for a minimum of three continuous noise monitoring terminals (NMT) to be installed at appropriate locations

around the wind farm site, and moved as different turbines (or groups of turbines) become operational. Clearer definition is required as to the relationship of the locations of the NMT to 'groups of turbines' and what is meant by 'groups of turbines';

- NMP 4.5 also needs the 'groups of turbines' definition;
- NMP 4.7 to 4.13 provide for monitoring to determine any cumulative effects. At 4.8 reference is also made to 'group of turbines', which needs better definition.

[112] In conjunction with PNCC, MRP was requested to prepare a set of revised noise conditions which included provision for these requirements and to submit these to us for our consideration as part of their response to the draft report.

Board Consideration of Comments on Draft Report

[113] Comments on the noise chapter of the Draft Report and MRP's May 2011 revised noise conditions were received from MRP, PNCC, the Wind Energy Association and a number of submitters.

[114] In its comments, PNCC signalled its agreement to MRP's May 2011 noise conditions except for disagreeing with MRP's proposal to exclude the 'Trevathan/Lloyd' condition for the progressive assessments and measurements of noise as requested by the Board in the Draft Report. The Board's Draft Report request for the inclusion of this condition was precautionary to preclude the risk of a repetition of the *West Wind* noise problems which only became apparent after all of the wind farm turbines had been installed and commissioned.

[115] The Board confirms that its original request should stand.

[116] MRP was also reluctant to accede to the Board's request for specific content of its draft NMP to be included in the conditions, with this reluctance being based on the view that the NMP should be retained as originally proposed in order to maintain flexibility. It is the Board's view that the requirements contained in the draft NMP attached to the 23 March 2010 joint agreement of the noise experts should all be mandatory and that, as such, they should form part of the conditions. We do not agree with MRP's proposition that they should be included in the NMP.

[117] The Board confirms that its original request should stand.

[118] In her comments, one of the submitters, Dr Huffman,³⁸ requested that the secondary noise limit wind speed should be measured at the residences rather than at the wind farm, and that speeds of 8m/sec and 10m/sec should be included (in addition to the proposed 6m/sec). Having considered this request, the Board has decided that the 6m/sec wind speed should prevail (as recommended in NZS6808), and that the wind speed should be measured at the wind farm but with

³⁸ #317, #664 Huffman: Comments on Draft Report: Proposed Amendments to Conditions.

the proviso that there should be two locations for this measurement, one in the vicinity of the turbines at the northern end of the wind farm and one at the southern end.

[119] For the avoidance of doubt, the northern-end measurement location should be used for determining when the secondary noise limit should apply for the residences at the northern end and the southern-end measurement location for the residences at the southern end.

[120] Dr Huffman also requested that, rather than the noise conditions being reviewed at one, three and five years post the completion of construction as proposed by MRP, these reviews should be undertaken annually. The Board has confirmed the review periods proposed by MRP, but requested that, following the completion of the Year 5 review, subsequent reviews should be undertaken at five-yearly intervals throughout the life of the wind farm. Also, for the avoidance of doubt, if MRP should elect to construct the wind farm in stages, the noise review timetable should commence from the end of the construction of the first stage.

[121] Mr Pringle, a submitter, requested consideration of a small number of amendments to the proposed noise conditions.³⁹ The key issues raised by Mr Pringle are an incorrect reference in Condition 18.2 (with which we agree); a proposal that, for the purposes of establishing when a secondary noise limit should apply, there should be two wind-speed measurement locations, one at the northern end of the wind farm and one at the southern end (a proposition which had been separately identified by the Board and with which we agree); and a comment that PNCC should be given three months rather than 30 days to respond to MRP's NMP (a timeframe which the Board considers should be the responsibility of PNCC to respond on).

[122] The New Zealand Wind Energy Association (NZWEA)⁴⁰ expressed concern that, in its view, the Board has elected to apply more stringent noise conditions than provided for in NZS6808:2010 particularly with respect to the inclusion of a secondary noise limit. In response, the Board notes that while it has taken strong guidance from NZS6808, it has also taken account of all of the evidence it heard and not just the content of the Standard. The Association has also requested that paragraph 35 (in the Draft Report) be modified to remove the reference to the continuity of wind noise. Whilst agreeing that there will be no turbine noise when the wind is not blowing, the Board notes that paragraph 35 was not a Board comment but a quote from the evidence of Mr Lloyd.

[123] In their comments on the Draft Report, the Adams family restated their claim that a small building on their land known as the Hautika Retreat should be classified as a residential dwelling. Hautika is 70 metres from Browns Flat and in Mr Adams' opinion 'is located at the heart of the wind farm proposal'. It has been

³⁹ #623 Pringle: Comments on Draft Report: Proposed Amendments to Conditions.

⁴⁰ #538 NZWEA: Comments on Draft Report: p4.

constructed in the far south-eastern corner of a large 75-hectare property generally in steep hill country. It is understood to be accessible only by foot or quadbike.⁴¹

[124] There is concern that construction noise from the wind farm will exceed the relevant noise standard at Hautika (seen as a spiritual retreat by the Adams') and that this will trigger abatement procedures under ss326, 327 and 328 RMA.

[125] In its comments on the Draft Report, PNCC, through its planner Mr Jeff Baker, sought the Board's determination of the residential status of Hautika so as to assist the council with its eventual administration of the proposed noise conditions.

[126] In particular, he referred to conditions 19 and 19.1 as follows:

19 Wind farm sound shall be measured and assessed in accordance with NZS6808 and these conditions of consent within the:

19.1 notional boundary of any residential dwelling either existing or consented at the date of this consent (excluding residential dwellings on properties on which turbines are located or where the owner has provided written consent to the wind farm).

[127] Hautika has a footprint of 10.8 square metres and is of Skyline Garage construction. It contains a plumbed-in sink which is supplied with roof water. An external composting toilet is located in a detached position from the building. There is no electric power.

[128] A building consent for the construction of Hautika was issued on 12 January 2007 and a Code Compliance Certificate on 11 July 2008.

[129] Mr Baker acknowledges that the facility is a habitable building and that, from time to time, Mr Adams in particular sleeps there as he is legally able to do so.

[130] We are also informed by Mr Baker that in terms of the RMA assessment of the building, as part of council's usual in-house review process, a council planner assessed Hautika as being an 'accessory building' as it was considered to be most closely aligned with this definition in Section 4 of the plan. This defines an 'accessory building' as:

... a building not being part of the principal building, the use of which is incidental to that of any other building or buildings on the site. In the case of a site on which no building has been erected, it is a building incidental to the use of the principal building permitted on the site. This includes a garage, carport, tool shed, playroom, recreation room, glasshouse, swimming pool, spa pool and sleepout.

[131] The building and use of Hautika were both classified as permitted activities.

⁴¹ #258 Adams J. #536 Adams J. *Response to Draft Report and Decision* paras 91–92.

[132] The district plan definition of a ‘dwelling’ is:

... means the self-contained home and includes buildings where board and lodging is provided for up to and including five people.

[133] PNCC accepts that the building consent provides for Mr Adams (or any party) to sleep in Hautika. However, PNCC does not consider for the purposes of the district plan that it is a ‘dwelling’ as it is plainly not self-contained based on the council’s assessment of the building consent documents (eg, there is no internal toilet/bathroom facility and nor is there a kitchen). In PNCC’s opinion, the building is most closely aligned to a ‘sleepout’.⁴²

[134] The Board’s decision is to classify ‘Hautika’ as an ‘accessory building’ incidental to the use of the principal building on the site (the Adams’ residential building) and that, as an accessory building, it is a ‘sleepout’ irrespective of whether it is used for spiritual or meditative purposes.

[135] The notional boundary for noise conditions to take effect is at the ‘boundary of any residential dwelling’. Although slept in by Mr Adams from time to time, Hautika it is not factually or legally a residential dwelling. As such, in terms of the noise conditions, Hautika does not qualify as a ‘residential dwelling’.

[136] The Board acknowledges that Mr Adams had provided information on the status of Hautika to the Board as part of his original submission on the wind farm. We did not clarify Hautika’s status in our Draft Report, principally because the issue was not identified clearly enough in the PNCC’s original response.

[137] In his response to the Board’s memorandum of 30 May 2011, John Adams attached as an appendix, a noise report prepared by Dr Thorne which included proposed noise management conditions for the wind farm.

[138] In his report, Dr Thorne predicted an annual average sound level at Hautika of 51.6dB LA_{eq}, as this is a building which we have determined does not qualify as a residential dwelling, we have not given any further attention to this predicted sound level.

[139] Instead we have focused on the Adams’ residence where Dr Thorne’s corresponding prediction is 36.2dB LA_{eq}, noting from his statement that an LA₉₀ level would be 2dB less or 34.2dB.

[140] This predicted sound level compares with MRP’s proposed noise condition limit of background sound plus 5dB or a maximum of 40dB LA_{90(10min)} or, if secondary noise limit conditions apply, a maximum of 35dB LA_{90(10min)}.

[141] As can be seen, Dr Thorne’s predicted sound level at the Adams’ residence would seem to us to be within MRP’s noise condition limits.

[142] We have also reviewed Dr Thorne’s proposed noise management conditions alongside those proposed by MRP and are satisfied that MRP’s

⁴² PNCC Response to Draft Report and Decision.

conditions adequately address various concerns raised by Dr Thorne including noise limits, special audible characteristics, and noise monitoring and complaint procedures. Having made the comparison, we have concluded that there is no need to make any amendments to MRP's conditions.

Findings

[143] Following its consideration of the comments received on the noise chapter of the Draft Report, the Board requested MRP to make a number of amendments to the May 2011 version of the noise conditions. In brief, these amendments were:

- confirmation of the Board's request for the Conditions to include the 'Trevathan/Lloyd' condition for the progressive assessments and measurements of noise and for the specific content of the proposed NMP to be included in the Conditions;
- with respect to the secondary noise limit, the addition of a condition for the wind speed to be measured at the wind farm at two locations, one in the vicinity of the turbines at the northern end of the wind farm (to be used for the residences at this end) and one at the southern end (for the residences at that end);
- following the Year 5 review of the noise conditions, for subsequent reviews to be undertaken at five-yearly intervals throughout the life of the wind farm and that, if MRP should elect to construct the wind farm in stages, for the noise review timetable to commence from the end of the construction of the first stage.

All of these amendments are incorporated in the Resource Consent Conditions attached to this Final Report.

[144] Finally, for the avoidance of doubt, the Board has determined that the Hautika Retreat owned by the Adams family does not qualify as a residential dwelling.

Chapter 16: Health and Safety

Introduction

[1] Many submitters, and especially those who live in the foothills close to the *Turitea* site and along the proposed wind farm access roads, have very real concerns over the potential effects of the construction and operation of the wind farm on their health and safety. In this chapter of our report we consider these concerns and respond to them.

Submitters

[2] Mr Pringle, who owns land in Pineland Drive, was one of many submitters concerned about the effects of turbine noise on health including sleep disturbance.¹ Dr Paul Dixon, a submitter, supported the findings of Dr Nina Pierpont's book *Wind Turbine Syndrome* which reports on 'an observational study of a number of individuals who developed [health] symptoms when residing close to wind turbines'.² Mrs Rosemary Adams, who lives on Greens Road, was concerned at the impact of construction traffic noise on her ability to sleep during the day following her overnight shifts as a midwife. Many submitters were concerned about the impacts on safety from construction traffic using Kahuterawa Road and Greens Road.³

[3] Many other submitters expressed considerable concerns about the impacts of wind farm construction traffic on the safety of local traffic, pedestrians, cyclists and horse riders who use Kahuterawa Road and Greens Road. These are responded to in some detail in Chapter 14 of this report where we also describe a series of conditions of consent for addressing traffic safety.

Issues

- [4] The principal concerns or issues raised and their potential effects were:
- adverse auditory effects from turbine noise during the operation of the wind farm, from construction traffic noise and from tinnitus;
 - flicker from the rotation of the turbine blades causing epilepsy;
 - electromagnetic effects arising from the passage of high voltage electricity along buried and aerial transmission cables;
 - electrical safety during the construction and operation of the wind farm;
 - occupational health and safety in general;

¹ #623 Pringle, Submission.

² #179 Dixon, Submission.

³ #258 Adams, Submission.

- traffic safety during construction;
- mental health concerns, including the effects of ‘wind turbine syndrome’.

Expert

[5] Dr D R Black appeared for MRP. He is a medical practitioner and lecturer experienced in health and safety issues around electricity generation, distribution and supply, as well as the telecommunications industry. Dr Black also addressed a number of other health and safety issues which can be of concern to people who live near to wind farms.

Evidence and Discussion

Tinnitus

[6] Dr Black explained that tinnitus is the perception of sound in the absence of corresponding external sound. Tinnitus can be perceived in one or both ears or in the head. It is usually described as a ringing noise, but in some patients it takes the form of a high-pitched whining, buzzing, hissing, humming or whistling sound, or as ticking, clicking, roaring, like ‘locusts’, tunes or beeping. It has also been described as a ‘whooshing’ sound, as of wind or waves. Tinnitus can be intermittent or it can be continuous. Tinnitus is not itself a disease but a symptom resulting from a number of underlying causes, including noise-induced damage to hearing. Dr Black concludes that this type of damage could not be caused by the *Turitea* turbines.

Traffic Noise

[7] In response to Mrs Adams’ concerns about noise from construction traffic disturbing her sleep, Dr Black had this to say:

... it is difficult to make rules which protect shift workers against disturbances of sleep and most shift workers have to make their own arrangements to be able to sleep during the day in an environment in which expected levels of noise may occur. There is a generally accepted norm in local body rules, generally, in New Zealand that overnight is a time in which quiet is maintained so that everybody can sleep. But it is also true that sometimes people have to sleep during the day and that has always been the case, and if that is the case one of the real skills that shift workers develop is the ability to either sleep in more noisy situations or to adapt their environment to enable them to – there is no other way around that.⁴

⁴ Black, NOE 2639.

[8] We note from the MRP 28 March 2010 Resource Consent Conditions that these include a condition prohibiting the use of engine braking over the flatter lengths of Greens Road. Also that MRP agreed during the hearing to seal Greens Road as a further way of mitigating the noise of construction traffic. As noted in Chapter 14 of this report, we have also requested MRP to restrict the use of Greens Road for construction traffic to a maximum period of four months except when the water catchment access road is blocked by the turbine erection crane.

Visual Effects

[9] Dr Black notes that a common concern raised with wind farms is that the rotating blades may cause ‘flicker’ resulting in a causal relationship between the flicker and photosensitive epilepsy. Visual flicker is an accepted cause of epilepsy, particularly in children, and there have been well-documented cases of this occurring from electronic games and television programmes. Dr Black notes that the effects of flicker are well described in the scientific literature with regard to the area of the visual field which must be affected and in turn the neurophysical amplitude of the flicker signal as well as its frequency and colour characteristics.

[10] In essence, it is Dr Black’s evidence that epilepsy can be precipitated in a few susceptible individuals when the light falling on a substantial part of their vision, over at least a quarter of the visual field, is interrupted in a regular pulsating fashion at a particular rate. The effect is also greater with certain colours, generally red.

[11] Dr Black concludes that none of these characteristics would be present in viewing the Turitea wind farm, from any angle, and that the possibility of epileptogenic flicker effect can be confidently excluded. He goes on to say that there is the potential for a flickering effect if the light is behind the turbines but since the velocity of the blades varies along the length, there is never a clear pulse effect. Furthermore, the contrast of the flicker image is low and diffuse as the turbine blades are illuminated by skylight. There is also no source of intense red-light energy analogous to that associated with epilepsy. And finally, and most importantly, at the viewing distances he assessed from the communities in question it is Dr Black’s assessment that the turbine blades occupy only a very small part of the viewer’s visual field compared with the total aperture of the illuminating sky. Overall, Dr Black considers that there will be no risk of epilepsy from this proposal.⁵ This evidence was not rebutted.

Electromagnetic Effects

[12] Dr Black described the biological effects of electric and magnetic fields. He identified that electric fields at 50Hz generally have a surface effect on the human body and at sufficient levels this can be felt as causing the movement of hairs at low levels and electric stimulus at higher levels. Where electric fields can be carried into conductive tissue, they can also be the source of internal electric fields which can cause stimulation of electrically sensitive tissue such as nerves

⁵ Black, NOE 2644–5.

and muscle. Dr Black advised that safety standards have been thoroughly established to prevent these effects as they are well understood and characterised.

[13] He went on to say that possible low level effects of extra low frequency magnetic fields have been associated with small excesses in the rates of certain cancers, although the results of tests have been inconsistent and inconclusive and the matter has never been entirely settled. Nevertheless, the existence of unsettled research does mean that the possibility remains of magnetic fields being a contributor to childhood leukaemia. However, in the worst case, this could only be an extremely rare risk.

[14] Electric and magnetic fields from the turbines and substations have to comply with the International Commission on Non-Ionising Radiation Protection (ICNIRP) Guidelines. At all areas of public access, these fields will be well within the public exposure reference levels in the guidelines. The electrical transmission conductors between the turbines and the substations and the proposed overhead transmission lines will also have associated electric and magnetic fields. These fields will be of a magnitude typically found around other high tension power distribution lines and will also comply with the public exposure reference levels in the ICNIRP Guidelines.

[15] Compliance with the ICNIRP Guidelines will, in Dr Black's opinion, eliminate any adverse biological or health effects, and there were no circumstances or conditions even approaching levels which could encroach on the living spaces anywhere around the proposed turbines or power lines.

Electrical Safety

[16] Dr Black notes that all electrical conductors will generally be insulated and buried or elevated. The substations will be totally enclosed and security restricted. There is therefore no risk to lawful public activity from any transmission cable or electrical conductor. Any aerial transmission lines will be designed to comply with the New Zealand Electrical Code of Practice for Electrical Safe Distances (NZECP 34:2001) [21], which provides a high level of safety equivalent to that found in other electrical facilities in New Zealand.

Occupational Health and Safety

[17] During the construction phase many of the required activities will be technically challenging and require highly specialised techniques with associated safety procedures. Dr Black advised that these issues will be addressed through compliance with relevant standards and the Health and Safety in Employment Act 1992.

[18] Overall, from a public health and safety perspective, Dr Black has concluded that the wind farm and associated substations and transmission lines can be constructed and operated with minimal (if any) effects on the environment around it. He considers there are no health-related effects that should prevent the granting of consent subject to appropriate conditions.

Mental Health

[19] The issue of mental health is closely linked to the auditory effects from the wind farm. Dr Black acknowledges that symptoms such as anxiety or even Reactive Affective Disorder have been associated with wind turbine generators. Reactive Affective Disorder can generally be described as a mental state characterised by a consistent pervasive alteration in mood affecting thoughts, emotions and behaviours. Dr Black maintains that these effects are a consequence of the interaction between an individual's attitude to, or perception of, the perceived offending stimulus and perhaps their underlying psychological state. These effects occur when an individual becomes distressed by a noise or sensation which triggers their awareness of the presence of the facility and escalating concern about harm. Anxiety then builds and a cue to the presence of a facility (such as visual or audible stimuli) becomes sufficient to trigger anxiety and distress.

[20] In response to a specific question from Mrs Adams as to whether an adverse effect from the turbines could be seen as a cause and effect on public health, Dr Black said this:

Yes, that is an important question and it is one that is often discussed and it is discussed I think in the evidence of Dr Palmer as well. The manner in which health can be affected by an effect on amenity is mediated by the psychological status and the effect and particularly the attitude of people in the receiving environment. So that people who live in an environment where there is, say, traffic noise some people may find it unacceptable whereas other people may not notice it and the moderating factor there is the attitude and the feelings of the people in that area. Any effect on actual health status is an indirect effect which is not by definition directly related to the agent such as noise or, for the matter, many other agents as well.

It is well accepted that such effects, which are noticed rather than have direct physiological effects, may be seen right down to levels of extinction. In other words, if somebody does not like something in their environment and they get to the point where the mere presence of it has an effect on their health that effect will continue right down until they actually do not notice it, until they are not aware of it. Having said that, the most common way in which such effect resolves is that people and when I say people, the vast majority of people adapt to changes in the environment. What people who set standards and guidelines (and I mean the recent European document just referred to is a very good example of that), have to do is make a decision about what is a reasonable level to reduce noticeable effects down to.⁶

Dr Pierpont's Book

[21] As we have already noted, Dr Paul Dixon supported the findings of Dr Nina Pierpont's book *Wind Turbine Syndrome* which reports on an

⁶ Black, NOE 2638.

observational study of a number of individuals who developed health symptoms when residing close to wind turbines. For wind farms, the term ‘wind turbine syndrome’ has been used to describe an experienced effect triggered in a small number of people from turbine noise. During the hearing, members of the Board had been given copies of Dr Pierpont’s book.⁷

[22] Dr Dixon notes that at the time that Dr Black wrote his evidence, Dr Pierpont’s book had not been published. Dr Dixon suggests that the wind farm syndrome does not prove causality but most cases did show an improvement or resolution when the people concerned moved away from the wind turbines, and in a few cases where they returned to live in the same proximity, the symptoms recurred. He pointed out that while the book has not been peer reviewed there are a number of eminent clinicians and scientists who have refereed and reviewed the book.

[23] Dr Black responded that wind farm syndrome is not a condition which is accepted in the medical and scientific literature and suggested that ideas based on this ‘syndrome’ should carry no weight. Further, counsel for MRP indicated one of the serious deficiencies of Dr Nina Pierpont’s work, which was frequently cited, is that she made a study of self-selected people, she had no control group for her cohort study and therefore could not meet tests for conclusive science with which we agree.⁸

Mr Pringle

[24] Mr Pringle also asserts the evidence provided by MRP is well out of date and does not meet the current state of knowledge. We reject that allegation. It was provided with a copy of the then draft noise standard DZ6808 to which Mr Hegley makes frequent reference. And Mr Hegley says this of the draft in response to a submission from Mr R M Cassells:

As a general comment, the technical content and approach of the draft does not vary significantly to the 1998 version. The main difference is that all ambiguities and areas that were not very clear have been addressed making the Standard much more specific. Should the revised Standard be published in its current form it would not alter the analysis or findings of my assessment of this wind farm.⁹

[25] We have noted in Chapter 15 that the draft standard DZ6808 was published as NZS6808:2010 in March 2010, and that the experts relied on this new standard for much of the noise evidence provided in the second part of the hearing, which we have largely now endorsed through findings and conditions.

⁷ Low, Exhibit 41 *Wind Turbine Syndrome: A Report on a Natural Experiment*, Nina Pierpont MD, PhD, K-Selected Books, Sante Fe, NM. It was also the subject of close attention from Dr Thorne for TAG and FOTR in his general evidence.

⁸ Thorne, NOE 3694. Dr Pierpont also cites a study by Dr Phipps of Massey University which has since been discredited.

⁹ Hegley, EIC para 12.4.

[26] Finally, Mr Pringle insists a precautionary approach has not been taken by MRP to the issue of noise. TAG makes a similar submission, but the test in s16 RMA is the ‘best practicable option’ (BPO) which is not a precautionary approach as set out above. Mr Hegley identifies what MRP has set out to do to achieve the BPO:

- the wind farm is to utilise three-bladed wind turbines to minimise noise;
- the turbines are to have pitch control;
- the turbines are able to be de-rated if required;
- the turbines are not known to have any known SAC.

(This is only a partial list – also included are all of the consent conditions on noise limits, monitoring and so on.)

Board Consideration of Comments on Draft Report

[27] Following a review of the comments received on the Draft Report, the Board has concluded that no modifications are required to its Draft Report findings on health and safety issues for the proposed wind farm.

Findings

[28] We accept Dr Black’s evidence that tinnitus, flicker and electromagnetic effects will not be issues for the *Turitea* wind farm. Traffic noise and traffic safety have both been addressed in some detail in other chapters of this report including the management and control of their effects through specific conditions of consent. We are satisfied that MRP will address the issues of general occupational health and safety including electrical safety through the application of relevant national or international standards supported by their own internal quality control and management systems.

[29] With respect to turbine noise, in Chapter 15 of this report, we have considered in some detail the basis on which the New Zealand Noise Standard NZS6808:2010 has been developed. In particular, we have noted that the standard is based on the World Health Organisation guidelines on noise levels considered to be acceptable for public health. Further, we understand that unanticipated SAC have been the trigger for most of the noise problems which have occurred at *Project West Wind* and possibly at *Te Rere Hau*. For *Turitea* there is to be the progressive assessment of turbine noise as the turbines are installed to ensure that SAC, should they arise, are dealt with promptly and not after the wind farm has been commissioned. In addition, we have accepted the advice of the noise experts that a secondary noise limit should be imposed at times of low background sound levels.

[30] Having considered Mr Pringle’s submission, we note that under cross-examination by counsel for MRP he openly conceded many of the points he had

raised.¹⁰ Against the background of the proposed noise conditions, Mr Pringle's responses under cross-examination as well as Dr Black's unchallenged evidence on mental health issues (primarily that 'the most common way in which psychological or mental issues are resolved is that the vast majority of people adapt to changes in the environment'), we accept that turbine noise from the development of the Turitea wind farm should not pose an unacceptable level of risk to public health.

¹⁰ Pringle, NOE 1802.

Chapter 17: Cultural

Introduction

[1] Tanenuiarangi Manawatu Incorporated (TMI) has been the legal entity for Rangitane o Manawatu (ROM) since 1989. It has had extensive involvement in RMA matters on behalf of their iwi since it was enacted. Paul Horton, environmental officer for Te Ao Turoa Environmental Centre, an environmental arm of TMI, was the lead person for their submission and statement of evidence. Mr Horton is an ecologist and has experience in working in the RMA field as well as with public and private agencies leading TMI in upholding their role as tāngata tiaki in the Manawatu.

[2] Rangitane o Tamaki nui a Rua (ROTNAR) is the iwi authority for Rangitane on the eastern side of the ranges. Based in Dannevirke, its submission was put forward by Graeme Eustace, administrator of the Cultural Political Services Sector. Their Cultural Values Assessment (CVA) was compiled by Peter McBurney, a professional historian from Auckland.

[3] Huatau Marae is based on Greens Road just below the proposed wind farm site. Their spokesperson is Paul Jones, who is chairman of the marae, and he is supported by Rosemary Adams and John Adams, who are also part of the Maraea Huatau whānau. The marae is unique in the sense that the people of the marae are affiliates of another iwi based in the Rangitikei District. The Jones whānau have established the marae within the rohe of Rangitane with the sanction of some of their elders.

[4] Peter Te Rangi is a descendent of Rangitane and knowledgeable in whakapapa and the history of Rangitane. A supporter of the Huatau Marae, his evidence focuses upon the significance of the Tararua Ranges to Rangitane and the extensive connections that exist between iwi who affiliate to the Manawatu Region.

[5] He Kupenga Hao I Te Reo is a Māori Language Education Provider in the Manawatu. Led by Ian Christensen, a fluent speaker of Te Reo, its submission gives important insight into the recognised expressions associated with the Tararua Ranges, the mana that they have beyond the local iwi, and how wind farms impinge culturally upon oratory and other matters.

[6] Susan Forbes, director of the archaeological and heritage research company – Kotuku Consultancy Ltd, prepared a s42A Report for the Board on Cultural Impacts – reading and analysing all reports, evidence and submissions prepared for the application.

Submitters

[7] A number of Māori organisations and individual submitters raised cultural issues. Lack of consultation and recognition of tāngata whenua was

important to some. The potential for significant adverse cultural effects and the destruction of archaeological characteristics, historical sites and wāhi tapu sites were also noted. For the local iwi, the proposal was considered to seriously affect their spiritual connection to the land and cause a loss of mana.

Issues

[8] From the evidence, we have identified a range of issues that arise. Those that need to be considered for their effects upon tāngata whenua include:

- the impact of the development of a wind farm upon ancestral lands and ancestral waters that are within the vicinity of the proposed site;
- the custom, traditions, cultural and spiritual values of the tāngata whenua that need to be recognised and provided for;
- effects upon wāhi tapu, other sites of significance, and taonga;
- the consultation processes in terms of s6(e) and s7(a) RMA;
- the impact of the proposal upon kaitiakitanga;
- whether the Treaty of Waitangi has been taken into account.

The Cultural Content of the AEE

[9] In the existing Environment Section under the heading ‘Cultural Values’, the AEE¹ sets out the background of the local iwi Rangitane. This section depicts ancient origins, tribal domain and significance of the Tararua Ranges.

[10] Under the heading of ‘Cultural Effects’, the AEE briefly records that the ‘main cultural concern of [the] proposal is its impact on the supply of mauri (spirit) from the range, and on intrinsically linked sites of significance, particularly the peaks Arawaru, Te Mata, and Tirohanga’.² It essentially goes on to say that mitigation of the impact of the proposal upon cultural values will be addressed via ‘a strong working relationship’ that is ongoing and for iwi representatives to be present during earthworks.

[11] Ms Forbes raises the concern that the ‘difficulty with the mitigation remedy proposed is that it is reliant on goodwill and trust (which are factors often influenced by the human element and may break down if staff at MRP change)’. She maintains that ‘firmer remedies such as partnership agreements would address this matter more robustly’.³

[12] In part 7 of the AEE, under the heading section ‘Matters of National Importance’, s6(e) RMA is noted ‘that consultation with tangata whenua in

¹ MRP, AEE Turitea Wind Farm *Assessment of Environmental Effects*, August 2008.

² Ibid, p106.

³ Forbes, EIC para 10.

this region has not identified any matters which the Turitea Wind Farm will impact upon'.⁴

[13] Ms Forbes comments that these statements are 'disturbing in their brevity'.⁵ She also states that the kaitiakitanga provision is not referred to at all. Furthermore, Forbes says that 'the AEE should set out how iwi concerns have been recognised and provided for'.⁶

[14] In terms of s8 RMA on Treaty of Waitangi matters, the AEE mentions that 'no significant concerns have been raised by iwi' and that they can be 'dealt with within the bounds of its existing relationship with iwi'.⁷

[15] Finally, the AEE deals with the subject of consultation with Rangitane Ki Manawatu, TMI and ROTNAR. Ms Forbes believes there are potential gaps when compared to the submissions that were made in terms of Huatau Marae and He Kupenga Hao I Te Reo. She believes that they could be considered to be iwi authorities under the RMA.⁸

[16] Ms Forbes' s42A Report was significant particularly in the early part of the hearing in terms of teasing out many of the cultural issues that were raised in the submissions. Ms Forbes also caucused with MRP representatives whereby many issues were advanced to her satisfaction and by formal agreements later in the process, many of these issues were agreed to by the tāngata whenua groups themselves.

Ancestral Lands

[17] All the evidence supports the position that the proposed wind farm site is within the rohe of Rangitane and more particularly ROM. The Rangitane people from the eastern side of the Tararua Ranges have analysed the proposal through a CVA and concluded that the thought that 'a substantial part of the proposed Turitea Wind Farm was to be sited on the Mangahao blocks are unfounded'.⁹ They note further that 'although the CVA failed to turn up any significant cultural sites of a specific nature, such as pa or urupa, the Tararua Range itself has been and remains culturally significant to Rangitane o Tamaki Nui a Rua'.¹⁰ 'To Rangitane, the peaks are sacred; they are associated with ancestors going back more than 20 generations to Rangitane and Whatonga. They serve as landmarks and cultural signifiers, able to be seen throughout much of the rohe and from the tops of which all the rohe can be seen.'¹¹

⁴ MRP, AEE Turitea Wind Farm *Assessment of Environmental Effects*, August 2008, p131.

⁵ Forbes, EIC para 12.

⁶ Ibid, EIC para 13.

⁷ MRP, Turitea Wind Farm *Assessment of Environmental Effects*, August 2008, p133.

⁸ Forbes, EIC para 15.

⁹ Cultural Values Assessment for Rangitane Tamaki Nui a Rua, by Peter McBurney, p28.

¹⁰ CVA, p28.

¹¹ Ibid, p25.

[18] The evidence of TMI notes that the Tararua Range is named after a Rangitane ancestor Tara. The range is also referred to as the backbone of Maui.¹² More specifically it is known from a cultural perspective as Tihi Pakirakira and then, when crossing the range became more regular, it became more commonly known as Arawaru. Finally, the land became part of the large block named Te Ahu a Turanga. More specific sites such as Mairehau (ie, Bryant Hill), named after the hapū of the same name, and Aokautere, being the name of Rangitane chief from the late eighteenth century, depict the strong relationship that Rangitane have with this area in terms of how they have lived and utilised it over many centuries.

Over time the ranges developed their own persona and place within ROM's cultural and spiritual belief system as a highly significant geomorphological feature in the landscape. The Tararua became respected and revered as a significant site and was regarded as a place occupied by past ancestors. These ancestors formed the peaks of the ranges and were situated in a position similar to those Rangatira and Kaumatua that sit on the paepae in the front of the marae.¹³

[19] By way of an independent perspective on these relationships, Ms Forbes notes that 'it is not just a place of significance for the iwi in terms of their relationship to the geographical features. The geographical features are directly connected through whakapapa, Tara was the uncle of Rangitane. The people here are shaped by their landscape just as people of the Whanganui River, Ko au te awa, Ko te awa ko au, it is not I am related to the river, I am the river'.¹⁴

[20] Peter Te Rangi, a descendant of Rangitane, offered further information on the ancestral connections to the Tararua Ranges. With reference to the peak Tirohanga he states that 'it is a point of inclusion, not exclusion'. He notes further that 'We are a kinship based people, relationship is very important to one another. We celebrate relationship with one another'.¹⁵ He submitted a paper by T W Downs which records the narrative of ancestor Matangi who named Tirohanga and many other sites in the rohe and how Rangitane, Ngati Apa and Ngati Hauiti are all connected to this ancestor. Whilst his evidence is accepted by the Board, the extent to which it is given weight in terms of the rights of the whānau of Huatau Marae as being Ngati Apa and being closely related to Rangitane does not equate to the same level of rights as that of Rangitane.

[21] Mr Te Rangi reinforces the point that TMI stated in its original submission that the 'Maori name for Bryants Hill is Mairehau' which 'is the name of one of the sub tribes of the Rangitane people of Manawatu and relates to that ancestor and those that descend from him'.¹⁶

[22] MRP has consulted with TMI and ROTNAR which has culminated in a Memorandum of Understanding (MOU) with TMI and an agreement in principle

¹² #322 Tanenuiarangi Manawatu Incorporated (TMI), Submission, paras 22–23.

¹³ #322 Horton, Submission, para 24.

¹⁴ Forbes, NOE 949.

¹⁵ Peter Te Rangi, NOE 2293.

¹⁶ Ibid, NOE 2295–2296.

to move to an MOU with ROTNAR. A key part of these agreements is a realisation by MRP that it is dealing with the iwi that have mana whenua in the local area.

Findings on Ancestral Lands

[23] The signing of an MOU with TMI and an agreement in principle to move to an MOU with ROTNAR based upon the CVA are sufficient to recognise that the lands on the land adjacent to the *Turitea* site are the ancestral lands of these two iwi.

[24] It is also noted that, as part of the MOU with TMI, a Pou Whenua will be commissioned at the entrance to the wind farm. The Board also finds that this is an important outcome that will recognise the mana whenua of ROM.

Ancestral Waters

[25] Central to the identity of Rangitane is the Manawatu River. Whilst the river is some distance away from the site, many streams within the site flow into the Manawatu. In terms of the evidence the *Turitea* and *Kahuterawa* Streams are significant to ROM, and the *Mangahao* River is important to ROTNAR.

[26] ROTNAR noted in their evidence that there were four reserves in the *Mangahao* blocks that were all adjacent to the *Mangahao* River. This reinforces that fact that most of these people lived along the river and thereby sought to reserve those lands that were most useful to them.¹⁷

[27] In reference to the *Turitea* Reserve, TMI note that ‘the resources within the reserve were an essential part of Rangitane o Manawatu life and culture for those people in the settlements of Te Kairanga on the Manawatu and *Kahuterawa* Rivers’. There has been a great deal of evidence as to the native fishery in the *Kahuterawa* Stream which must have been, and remains through to today, a significant ancestral waterway for Rangitane.¹⁸

[28] The name ‘*Turitea*’ means ‘bright clear water’ and hence it was no surprise to the Board that it was eventually designated a water catchment reserve for the main water supply to Palmerston North City.¹⁹

[29] ROM also stated their concern as Wai mana in the area with regard to a rare species of worm that is severely affect by fluctuations in water quality which could be an effect if the catchment of the wind farm is not well managed. This worm is understood to be present in the *Kahuterawa* and *Turitea* catchments. In this regard they state that they ‘wish to be resourced to undertake the independent

¹⁷ CVA, p23.

¹⁸ #322 Horton, Submission, para 32.

¹⁹ Ibid, para 31.

population monitoring work to ensure the faunal integrity of the reserve is maintained'.²⁰

Findings on Ancestral Waters

[30] The Board agrees that the signing of an MOU with TMI and an Agreement in Principle to move towards signing an MOU with ROTNAR will be important mechanisms in recognising and providing for the relationship of these two iwi with their ancestral waters within the wind farm site.

[31] The Board also recognises that the proposed cultural monitoring plan will be an important component in fulfilling the recognition of this aspect of s6(e).

[32] The participation of TMI in the revegetation work in conditions is also noted as being a provision that can assist in the relationship of TMI with its ancestral waters.

Customs, Traditions, Cultural and Spiritual Values

[33] In TMI's original submission specific rituals were noted as taking place in the Tararua Ranges. Their submission states that 'A number of ritualistic practices were undertaken in the affected area and the Tararua Range. These sites later developed into tapu or waahi tapu sites where only certain people such as Kaumatau and Tohunga were allowed to go and perform certain tasks'.²¹

[34] A statement that illustrates such a practice is a ROM proverb which underpins Māori spirituality in relation to the Tararua Ranges.

'Hokia ki nga maunga kia urea koe e nga hau a Tawhirimatea.' Return to the mountains to be purified by the winds of Tawhirimatea.²²

The ritual and ceremonial practices performed at the peak of a mountain and/or range was to have their hau regenerated or purified by the winds of the god, Tawhirimatea. This practice is still presently performed at various locations along the Tararua Ranges.²³

Physically the Ranges contain many tracks that linked ROM from the Manawatu to ROM from Tamaki Nui a Rua and Wairarapa. Situated along the Ranges and its peaks were tracks that were used regularly for travel and hunting. A number of tracks and peaks contained signal fires that were used as communication and warning.²⁴

²⁰ #322 Horton, Submission, para 64.

²¹ Ibid, para 21.

²² Ibid, paras 25–26.

²³ Ibid, para 27.

²⁴ Ibid, para 29.

[35] The tracks were also valued by ROTNAR. In the iwi evidence they record that ‘The ranges also contained ara Maori (Maori tracks), of which today’s Pahiatua Track (the Pahiatua–Aokautere) is but one. These provided Rangitane from both sides of the range access to the mountains and their resources, as well as different routes by which each side could visit the other. The fact that they did so is evident from the whanaungatanga (close kinship) they share’.²⁵

[36] In terms of the effects of the wind farm, a basic Māori custom is the reference to significant landforms in terms of reciting a pepeha. In this formal introduction of one’s identity in the Māori world, generally the individual refers to their waka or ancestral canoe, their mountain or in this case their Pae Maunga or mountain range – Tararua, and then one’s river and one’s tribe. In his evidence on behalf of the Māori Language Education provider, He Kupenga I Te Hao, Ian Christensen ponders the scenario ‘Can you imagine welcoming manuhiri onto Huatau Marae, secluded and peaceful in the afternoon setting sun except for the swish of blades from the turbines dominating and towering above the hills just behind the marae’.

[37] ‘The orator stands – ko Tararua o te Maunga, Tararua is the sacred mountain, te pepeha of identity and pride will become a source of embarrassment and possible derision. We have already experienced this ourselves. During the course of our business we often have occasion to welcome visitors from outside the region. It is becoming a common place for visiting speakers to pass comment during the whai korero about the vast scale and intrusive nature of the industrial structures sitting a to Te Pae Maunga o Tararua, a major source of Maori and a major identity marker for local iwi.’²⁶

[38] ‘The Tararua (and Ruahine) Ranges are pivotal to Rangitane o Manawatu cultural identity; Rangitane o Manawatu pepeha (formal introduction) contains reference to them as their pai maunga (mountain) and has essentially become to a certain extent part of their whakapapa.’²⁷

Findings on Customs, Traditions, Cultural and Spiritual Values

[39] The enduring relationship envisaged in the MOU with TMI is seen as a means for recognising and providing for the culture and traditions of Rangitane on the wind farm site. This relationship will be important in order to counter the imbalance regarding adverse effects of the wind farm on the cultural identity of the tribe.

[40] It is also noted that MRP’s undertaking of blessing ceremonies prior to construction also recognises the importance of tikanga Māori to Rangitane.

²⁵ CVA, p25.

²⁶ Christensen, NOE 2302–2303.

²⁷ #322 Horton, Submission, para 16.

Wāhi Tapu and Other Sites

[41] The issue of wāhi tapu and other sites within the wind farm involves several key contextual matters which affect the way the parties deal with this aspect of s6(e). First, the matters are sensitive to the tāngata whenua, Rangitane, and so they prefer to be the primary guardians of information associated with these sites. This can mean that sites are referred to generally and some specific information is confined to being disclosed only in confidential discussions between Rangitane and the applicant in order to protect those sites. This can apply to their exact location and the nature of those sites. The Board respects the position of the tāngata whenua in this regard and is also grateful for what has been shared by way of evidence presented by the representatives of Rangitane.

[42] Another contextual issue that must be considered with these matters is the notion that sites can be unknown and therefore, they can be potentially uncovered in a process such as the development of a wind farm. Therefore the provision of an accidental discovery protocol is essential to protect such unknown sites.

[43] A final contextual matter that is apparent in this case is that sites can be of significance to more than one tāngata whenua group. ROM are clearly the tāngata whenua group that are primarily affected by this application in terms of wāhi tapu and other sites but evidence is also presented by ROTNAR in terms of Arawaru and Tirohanga, and one witness refers to the importance of Tirohanga to Ngati Apa and Ngati Hauiti as well as Rangitane. However, the Board does not view these aspects as critical.

[44] The evidence presented by TMI initially informs us that their records show that within their entire rohe there are approximately 700 sites of significance, with 30% of them being considered wāhi tapu. They note further that ‘at present only a handful still exist (less than 10) in the original state. None are formally protected by the Historic Places Trust’.²⁸

[45] Then there is a list of sites that could be affected that are in the vicinity of the proposed wind farm site. This includes six archaeological sites, one reserve, one signal fire site, six natural peaks, one natural clearing, two tracks, two kainga/villages, two occupied sites/camp sites, and one pa.²⁹

[46] The evidence of TMI then condenses down to the key significant sites affected. Horton states that there are ‘6 peaks of significance’ that are important to ROM which are ‘either directly under or near turbine sites’.³⁰ In that paragraph he does not state what those sites are but previously he states that sites immediately affected by this development are the peaks: Marima, Arawaru, Tirohanga, Ramiha, and Browns Flat (Te Mata).³¹ This totals five sites or peaks. The sixth

²⁸ #322 Horton, Submission, para 49.

²⁹ Ibid, Table 2, pp12, 13.

³⁰ Ibid, para 38.

³¹ Ibid, para 18.

one is unknown but one could speculate that it may be Mairehau which has been mentioned earlier in their submission and is within the wind farm.

[47] When questioned by the Board regarding the matter of turbines and their effects upon significant peaks, Horton responded by stating ‘Yes. The Mahinga [Marima] and a couple of the other ones, they were – and we outlined in our CIA that they were within 50 to 100 metres of turbine sites, so it was more proximal effects rather than direct placement of a turbine on the actual peak itself of Tirohanga’. He states further that ‘Yes, we have satisfied that as well under the adoption of the MOU’.³²

Findings on Wāhi Tapu and Other Sites

[48] We make findings that the adoption of the MOU between the applicant and TMI, with particular focus upon the removal of turbine 55 along with working closely with TMI on the turbine sites that affect Ramiha, Marima, Te Mata and Mairehau, will recognise and provide the relationship of ROM with their sites and wāhi tapu.

[49] The conditions regarding the Accident Discovery Protocol will provide a process for dealing with unknown sites that may arise in the process of constructing the wind farm.

Taonga

[50] The matters that fall into the category of taonga within this application are expressed by ROM as taonga species within the proposed wind farm site. Horton notes that ‘There are several waahi taonga species which have the potential to be affected by earthworks, deforestation related to heavy machinery movements and site clearance, or sedimentation events related to storm water runoff’.³³

[51] Many twentieth-century studies have uncovered evidence of indigenous flora and fauna in the ranges around the wind farm site which in turn, due to deforestation, have become rare and in some examples extinct. The relationship of the tāngata whenua with these species as part of their traditional lives is of utmost importance. They sustained them as food sources, they were emblems of their mana amongst fellow kinsman and could also be climatic seasonal indicators which guided ROM in their kaitiaki role of the forest and waterways of the Tararua Ranges.

[52] In evidence, specific species of importance are noted as being known to have been in the Tararua area. These include ‘at least 11 species (which) do not occur in any other part of the Manawatu’,³⁴ ‘a rare orchid, tutukiwi is also located

³² #322 Horton, NOE 941.

³³ Ibid, Submission, para 19.

³⁴ Esler, 1978, cited in #322 Horton, Submission, para 36.

in the foothills of the Aokautere area'.³⁵ 'Huia, an extinct bird species was prized by Rangitani o Manawatu. Kiwi, kokako, weka, kereru, kaka and the legendary hokio were all found in the ranges. Kotuku visited as a kaitiaki, to wahi tapu lakes such as Hapuakorari'.³⁶

[53] Another source cited by TMI was Adkin, who recorded lists of foods sourced in the ranges including the berries of the hinau tree, mouku fern, and pitau which are the young fronds of the mamaku fern.³⁷ The range was also a 'site where various plants with medicinal values would be gathered'.³⁸

[54] In the contemporary scenario, the kaitiaki role with regard to taonga species is significant to the extent that ROM are looking to care and protect for what are now remnant species. An active role in the monitoring of the flora and fauna on the wind farm site is desired in order to renew their relationship with their taonga and so that the fine balance of the biodiversity in the Tararua Ranges can be at least maintained if not enhanced.

[55] ROM have some ready concerns regarding some species, such as flightless crane fly, lizard populations and a Polychaete worm (as noted earlier) that inhabits the waterways of the Turitea and Kahuterawa catchments.³⁹

Findings on Taonga

[56] Through the development of a cultural monitoring plan the concerns identified above will be addressed by this initiative between the applicant and tāngata whenua. Also, the condition regarding revegetation will help create appropriate biodiversity for taonga species to flourish. It is also envisaged that, under the MOU, ROM will receive other monitoring plans in order to track the numbers and condition of taonga species. Finally, the removal of turbines in areas of indigenous vegetation will lessen any impact upon taonga species within the Turitea wind farm site.

Consultation with Iwi

[57] Several issues have been raised in relation to whether iwi consultation has been sufficient. This is a significant development and MRP set out on a programme of consultation which has had varying levels of success in terms of how those being consulted have rated their work.

[58] Mr Henry, as project manager for MRP, noted in his evidence-in-chief the concept of consultation principles that he utilised. He further explained his approach in responding to questions from the Board by stating that 'often if new to an area it can be less clear who to talk to, which groups etc. And what we

³⁵ #322 Horton, Submission, para 37.

³⁶ Ibid, para 39.

³⁷ Adkin, 1948, cited in Horton #322 Submission, para 40.

³⁸ Teira, 1999, cited in Horton #322 Submission, para 40.

³⁹ Horton #322, Submission, paras 43–45.

typically do in that sort of situation, is take advice from local people, be that Iwi Liaison officers at council, be that certainly folk of local Marae and so forth to try and understand the process and who we need to talk to'.⁴⁰ Based on that approach, MRP identified TMI and ROTNAR, Te Rangimarie Marae Trustees and the whānau and trustees of Huatau Marae. Other groups and individuals have made submissions noting cultural issues but MRP has opted to focus on putting in a concerted effort with these four groups.

[59] Mr Henry also outlined further consultation principles when asked by the Board whether he believed that the consultation he had carried out had achieved meaningful input into decision making from tāngata whenua. He responded by saying 'Ultimately, yes. I guess on the journey to get to that point, we have had various hui and meetings with groups to best understand their particular concern. And in those instances where we could, we have identified their issues and responded [to] it accordingly. So in that regard, yes, I do believe we have allowed the view of Maori, particularly the iwi authorities to influence our decision making'.⁴¹

[60] The two iwi authority organisations (TMI and ROTNAR) have both adopted a collaborative approach which has been of great assistance to the applicant, and overall enabling a satisfactory outcome for those respective parties. Te Rangimarie Marae was consulted where Mr Henry described the relationship as being 'from a more holistic point of view I would suggest where we certainly take their guidance on matters going forward as well'.⁴² The other significant Māori group that is affected by this application, namely the Huatau Marae, has not been satisfied by the level of the consultation, however, it has received.

Rangitane o Manawatu (Represented by Tanenuiarangi Manawatu Incorporated)

[61] The consultation process with TMI has been ongoing since the earlier application with the PNCC in 2006. It is recorded that a Cultural Impact Assessment was prepared by the iwi in 2006 and then updated as the process moved along in 2008. This allowed TMI to investigate many of the effects of the wind farm proposal upon ROM and to devise some remedies which would avoid, remedy and mitigate these effects.

[62] After the application became subject to a call-in by the Minister, TMI prepared a submission, which was lodged in February 2009, that outlined many of these effects which were in the process of being discussed with the applicant. Next, a statement of evidence was compiled by Paul Horton on behalf of TMI and lodged on 22 May 2009. This showed that further progress had been made on several issues but at this point there were still some outstanding.

⁴⁰ Henry, NOE 864.

⁴¹ Ibid 865.

⁴² Ibid 866.

[63] The hearing began on 6 July 2009, and by 20 July Mr Henry stated in his supplementary evidence that an MOU had been confirmed⁴³ which underpinned many recommendations that had been sought by TMI.

Te Rangimarie Marae

[64] Te Rangimarie Marae has been referred to at various times during the hearing and was consulted with as far back as July 2006. Unfortunately, their submission was out of time and disallowed by the Minister.

[65] Nonetheless, MRP continue to consult with Te Rangimarie Marae and see its role as significant to the extent that they are noted as a party in conditions regarding the Community Liaison Group.

Rangitane o Tamaki Nui a Rua

[66] The consultation with ROTNAR has not been as extensive as the other iwi groups. As noted by Mr Henry, MRP has ‘engaged with Tamaki Nui A Rua around the development of a cultural values assessment as they have described it’.⁴⁴ That CVA was completed on 3 July 2009, whereby it noted several concerns regarding the impact of the wind farm development which could be mitigated by fostering of a positive relationship between the iwi and MRP.⁴⁵ Mr Henry also noted that ‘we have also agreed in principle that they would like to move to a memorandum of understanding’.⁴⁶

Huatau Marae

[67] On 6 July 2006 a consultation hui for the proposed wind farm was held at Te Rangimarie Marae where Huatau Marae Trustees were also present to hear the korero. Huatau Marae maintain that more consultation was sought by them and a hui at Huatau Marae was to be arranged but nothing formal eventuated until the release of the Turitea Wind Farm Proposal in August of 2008.⁴⁷

[68] The expectations of Huatau Marae were repeated at that general meeting and on 29 November 2008, when MRP representatives met with Huatau Marae whānau. After that hui, a letter was written to MRP by Huatau Marae representatives (dated 30 November 2008) outlining concerns and seeking further dialogue. A reminder was emailed on 9 January 2009. Photomontages were received in March 2009 after submissions were lodged.⁴⁸

⁴³ Henry, SE para 5.1.

⁴⁴ Ibid, NOE 848.

⁴⁵ CVA, pp 28, 29.

⁴⁶ Henry, NOE 848.

⁴⁷ #9 Huatau Marae, Submission p6.

⁴⁸ Ibid, Appendix 2.

[69] Eventually, on 23 April 2009, MRP replied to Huatau Marae where some concerns were being worked on, others were not progressed.⁴⁹ With this, Huatau Marae replied on 25 May restating the position of 30 November 2008.⁵⁰

[70] The next piece of correspondence came from MRP on 3 July 2009 which Huatau Marae perceived that MRP had belatedly sought a greater understanding of Huatau Marae issues and concerns regarding the proposal and that this response was connected to some of the statements made in the s42A Report by Ms Forbes, which was received by all parties in June 2009.⁵¹

[71] Mr Henry acknowledges a letter from Huatau Marae dated 31 July 2009 in cross-examination by Huatau Marae counsel, Mr Johnson. Mr Henry felt that this letter does not add to what MRP requires which is related to understanding the status of Huatau Marae in relationship to the Rangitane iwi and whether MRP should be dealing with Huatau Marae regarding Māori cultural issues.⁵²

Findings on Consultation

[72] First, the Board notes that consultation is not an RMA requirement but it 'is recognised as good practice where proposals may affect matters in ss6(e) or 7(a)'.⁵³ The Board finds that this has been upheld with regard to TMI and ROTNAR with both processes culminating in written agreements which set out agreed actions.

[73] The Board also finds that the applicant followed good practice in their consultation with Huatau Marae. There are several 'actions and commitments' that have been undertaken by the applicant including the commissioning and provision of photomontages, background noise monitoring and a commitment to seal parts of Greens Road. Also, as part of the redesign, several turbines have been removed and repositioned which have been beneficial to Huatau Marae. A great deal of this is due to the consultation carried out by MRP with representatives of Huatau Marae.

Kaitiakitanga

[74] In approaching the question of having particular regard to kaitiakitanga, it has been stated in the past that one 'must first determine who are the kaitiaki'. Furthermore, it is possible 'guardianship, in Tikanga Maori, may involve degrees, and exercise of stewardship at different levels'.^{54, 55}

⁴⁹ #9 Huatau Marae, Appendix 5.

⁵⁰ Ibid, Appendix 6.

⁵¹ Ibid, Appendix 7.

⁵² Henry, NOE p851.

⁵³ See *Ngatiwai Trust Board v Whangarei District Council* AO 80/95, 4NZPTD 610.

⁵⁴ See *Friends and Community of Ngawha v Minister of Corrections* 20/6/02, Wild J. HC Wellington AP110/02, 7 NZED 592, para 70(a).

⁵⁵ See *Friends and Community of Ngawha v Minister of Corrections* 17/12/02 [EC] CA 216/02, paras 29–30, 9 ELRNZ 67, 8 NZED 47.

[75] In examining the evidence in this case regarding kaitiakitanga, the possibility posed in the above approach is clearly evident. The three groups who have, in various ways, sought to be regarded as kaitiaki require specific analysis.

Rangitane o Manawatu (Tanenuiarangi o Manawatu Incorporated)

[76] As noted earlier in this chapter ROM represented by TMI are clearly the broadly acknowledged tāngata whenua for the lands involved in this application. A large amount of its original submission and subsequent statement of evidence by Mr Horton is directed at the kaitiaki role the people wish to uphold in order to care for and protect their customs, values and resources that are present on the wind farm site.

[77] They look to carry this out through mechanisms such as an accidental archaeological discovery protocol and an accidental discovery protocol guideline that TMI have utilised themselves. TMI have also advocated for a cultural monitoring plan to be established and for ROM to be regularly informed of the results of any other monitoring plans.

[78] Essentially, they were looking for ‘an active relationship that includes iwi or mana whenua/wai mana in the monitoring of their environmental taonga in relation to the impacts from resource consents ultimately leading to the enhancement of their kaitiakitanga and a better environment’.⁵⁶

Rangitane o Tamaki Nui a Rua

[79] The CVA referred to earlier that was compiled for ROTNAR identified the extent of their cultural interests regarding the wind farm site. They are minor in comparison to ROM.

[80] However, the wind farm does still impact upon them in terms of sites such as Tirohanga and Arawaru being important maunga (mountains) to both Rangitane groups. There are also water sedimentation, flora and fauna issues with catchments that drain away from the site off the eastern side of the ranges.⁵⁷

[81] They also make a point about decommissioning of the wind farm so that the site can be restored once the farm is no longer used for that purpose.

[82] They also feel that all of these concerns can be mitigated through the fostering of a positive relationship between themselves and the applicant.⁵⁸

[83] Due to the close relationship between the two branches of Rangitane it is possible for very significant sites to have great status for both iwi whereby an element of kaitiakitanga is shared. In this case, the primary kaitiaki role is with ROM, and ROTNAR will no doubt seek a role through their own MOU with the applicant.

⁵⁶ #322 Horton, Submission, para 41.

⁵⁷ CVA, p28.

⁵⁸ Ibid, p29.

Huatau Marae

[84] The position of Huatau Marae, their trustees, whānau and supporters is one that requires careful analysis with regard to the concept of kaitiakitanga within an RMA context. As noted earlier in other cases, the courts have recognised the notion that kaitiakitanga can exist, in tikanga Māori, at different levels.

[85] As was indicated early in the hearing, the whānau descended from Marae Huatau are not Rangitane and are affiliated to Nga Wairiki and Ngati Apa from the Whangaehu River valley some 15 kilometres south of Whanganui. The background to the marae being set up within the Rangitane rohe was explained by its chairman Paul Jones.

Prior to establishing Huatau the whanau entered in consultation with senior Rangitane representatives to seek their approval to establish a marae within their rohe. This involved discussions with and site visits by the late Joe Te Awe Awe and Balkan Reihana as well as Charles Matenga and others of Te Rangimarie Marae at Rangiotu.

The late Bob Tamihana who, at the time was kaumatua to the council, police and the Kopinga Marae at the Palmerston North Teachers Training College, helped facilitate this process. Huatau received their blessing and ultimately this was signified by the laying down of the mauri in a ceremony officiated by the late Joe Tukupua, a respected tohunga of Muaupoko.⁵⁹

Findings on Kaitiakitanga

[86] To go further, the Board asked questions around clarifying the sanction that was given by Rangitane elders at the time and whether this would imply a kaitiaki role for the Huatau Marae and its surroundings. Mr Jones replied that ‘Yes. We certainly feel that we have a responsibility for the area immediately surrounding [the Marae], area we have populated with bush, trees.’⁶⁰

[87] It was made distinct later from being the kaitiaki rights of a hapū of Rangitane and being related to the site of the marae, where Mr Jones replied further that ‘the significance of having the mauri laid down by Rangitane to us really gave us a sense of responsibility that they were entrusting us to do something on their behalf and that certain[ly] gives us the feeling that we are kaitiaki with and on their behalf’.⁶¹

[88] Along with this, it is noted that in evidence it was stated that there are connections with Rangitane through Kurahaupo waka and Peter Te Rangi also informed us of evidence regarding close ties between Ngati Apa, Rangitane and

⁵⁹ #9 Huatau Marae, Submission; Jones, NOE 2277.

⁶⁰ Jones, NOE 2284.

⁶¹ Ibid, 2284.

Ngati Hauiti with regard to a shared ancestor ‘Matangi’ whom is said to have named the peak Tirohanga.

[89] For the purposes of the RMA, and based upon the evidence presented, the Board is limited to recognising the kaitiaki status of Huatau Marae in terms of the marae and surrounding marae lands. This implies that, in having regard for the kaitiakitanga of Huatau Marae, the Board will add that component into its deliberations of any adverse effects of the proposal on Huatau Marae.

[90] The Board finds, in having regard for kaitiakitanga, MRP has achieved this through developing an MOU with TMI which includes, in particular, a Cultural Monitoring Plan, protocols for the placement of turbines WT99 and WT27, and the removal of WT55, and it is envisaged that TMI will receive reporting on other monitoring plans. (We note in Chapter 13 that we have deleted WT27 for ONF reasons.)

[91] There are also conditions regarding an active role in revegetation programmes on the site, accidental discovery protocols, and membership on the Community Liaison Group.

[92] We find MRP also fulfils s7(a) by having an agreement in principle to move toward an MOU with ROTNAR based upon their CVA.

Board Consideration of Comments on Draft Report

[93] Submissions on the cultural issues chapter of the Draft Report were received from a number of parties⁶² all associated with the Huatau Marae. In the following paragraphs, we summarise the key issues raised and our consideration and responses for each.

[94] The marae has requested formal representation on the Community Liaison Group. The Board’s view is that there should be at least one resident of Kahuterawa Road and Greens Road on the Community Liaison Group but that this person does not necessarily need to be a representative of the marae.

[95] A request was made for disclosure of the MOU between TMI and MRP. As the Board is not a party to this MOU, any such request for disclosure would need to be directed to TMI or MRP.

[96] In response to the claim that TMI’s mandate is confined to the Treaty settlement process, the Board is aware that, for many years, TMI has participated in many RMA hearings on behalf of ROM.

[97] The submissions are also critical of the Board’s view on the level of rights regarding ancestral lands attributed to Huatau Marae. Following careful consideration of the evidence regarding the status of Huatau Marae in regard to

⁶² John Adams, Rosemary Adams, Tim Adams, Huatau Marae Trustees, Wayne Johnson (Legal Counsel).

ancestral lands and kaitiakitanga, the Board's conclusion is that the marae does not have the same status as a hapū of Rangitane.

[98] Finally, in response to the claim that Huatau Marae is a wāhi tapu, which should be recognised and provided for, the Board notes that this was not raised in evidence and consequently there is no corroborated evidence from Rangitane submitters to substantiate this claim.

Overall Findings

[99] In this chapter we have recorded our findings on individual issues as these have been considered, namely ancestral lands, ancestral waters, customs, traditions, cultural and spiritual values, wāhi tapu and other sites, taonga, consultation and kaitiakitanga. Following its consideration of the submissions on cultural issues, the Board has reaffirmed each of its Draft Report findings.

Chapter 18: Planning Instruments

Introduction

[1] Before the hearing, the expert planners caucused and provided a substantial report which helped us focus on the important issues to emerge from the planning documents of which the regional ones were substantial.¹

Relevant Legislation and Statutory Documents

[2] Section 104(1) RMA provides that when considering an application for a resource consent and any submissions received the consent authority must have regard to (inter alia):

- (a) ...
- (b) any relevant provisions of –
 - a national policy statement;
 - a New Zealand coastal policy statement;
 - a regional policy statement or proposed regional policy statement;
 - a plan or proposed plan; and
- (c) other matters the consent authority considers relevant and reasonably necessary to determine the application.

[3] The planning documents which we have taken account of in our evaluation are as follows:

- National Policy Statement: Electricity Transmission (2006);
- Proposed National Policy Statement: Renewable Energy Generation (2008);
- Operative National Policy Statement: Renewable Energy Generation 2011;
- Manawatu-Wanganui Regional Policy Statement;
- Manawatu-Wanganui Regional Air Plan;
- Manawatu-Wanganui Regional Land and Water Plan;
- Manawatu-Wanganui Regional Plan for the Beds of Rivers and Lakes;
- Manawatu Catchment Water Quality Regional Plan;
- Operative PNCC District Plan;
- Operative Tararua District Plan;
- Proposed One Plan (Horizon's Regional Council Proposed Regional Plan);

¹ Pollock, *BECA Planning Expert Report*.

- New Zealand Energy Strategy (2007);
- New Zealand Energy Efficiency and Conservation Strategy (2007);
- Turitea Reserve Management Plan.

Submitters

[4] The concerns of the submitters include consistency with relevant national, regional, and local regulatory documents, strategies and legislation.

Experts

[5] The planners who addressed all or some of these matters were Mr Gregory Pollock, planning consultant to MRP, Mr Jeff Baker, senior planner for PNCC, Mr Philip Hindrup, senior planner for Horizons Regional Council (HRC) and Helen Anderson of URS New Zealand Limited, author of the s42A Report. There was no representative from the Tararua District Council (the TDC). Mr Pollock canvassed most of the plan provisions not addressed by the other parties in his extensive first brief of evidence, while a caucus report by the planners provided a clear overview of their considerations.

[6] The Planning Expert Report identifies that ‘Mr Hindrup was the only party to discussions involving the regional council’s consents, the objectives and policies of the regional planning documents and discussions around the skyline provisions of the operative and proposed RPS. Because his evidence supports a neutral position, he was not involved in other aspects of the caucusing’.²

Issues

[7] The major issues arising from the plan provisions include:

- renewable energy and climate change matters;
- land use and water (water/sediment concerns);
- outstanding and significant natural features and landscapes and their identification in the operative regional policy statement (RPS).

[8] All other plan provisions which encompass aspects referred to under particular chapters such as ‘traffic’, ‘noise’ and so on of the proposal are recorded in the text of the chapters identified.

² Pollock, *BECA Planning Expert Report* pp1–2.

Evidence and Discussion

National Policy Statement: Electricity Transmission

[9] Mr Pollock was the only planner to draw attention to the National Policy Statement (NPS) in relation to electricity transmission which was gazetted on 13 March 2008. It was to be expected that the statement may have applied to renewable energy projects of national significance and given guidance on how these might be approached under the RMA. But the sole objective of the statement refers only to the electricity transmission network. This is defined for consenting purposes as Mr Pollock put it, in such a manner it applies only to those aspects of transmission which are the responsibility of Transpower New Zealand Ltd.³ The policy objective, however, infers something more than that for it reads:

To recognise the national significance of the electricity transmission network by facilitating the operation, maintenance and upgrade of the existing transmission network and the establishment of new transmission resources to meet the needs of present and future generations, while: managing the adverse environmental effects of the network; and managing the adverse effects of other activities on the network.

In achieving the purpose of the Act, decision makers must recognise and provide for the national, regional and local benefits of sustainable, secure and efficient electricity transmission. The benefits relevant to any particular project or development of the electricity transmission network may include:

- i) maintained or improved security of supply of electricity.

[10] MRP intends to construct a high voltage transmission line to transmit the energy developed by the Turitea wind farm to the nearby transmission substation at Linton. This will be a benefit which will provide improved security of supply of electricity to both the national grid and locally. In this regard, the wind farm meets the provisions of the statement.

Proposed National Policy Statement: Renewable Energy Generation

[11] At the time we published our Draft Report, the NPS on Renewable Energy Generation had not been gazetted. Instead, we evaluated the impact of the proposed NPS which had been publicly notified on 6 September 2008. This proposed NPS provided a nationally significant context for *Turitea* in that its objective was:

To recognise the national significance of renewable electricity generation by promoting the development, upgrading, maintenance and operation of new and existing renewable electricity generation activities, such that 90 per cent of New Zealand's electricity will be

³ Pollock, EIC paras 116–118.8.

generated from renewable sources by 2025 (based on delivered electricity in an average hydrological year).

[12] Mr Pollock and Mr Baker addressed the proposed NPS and agreed it could be given little weight because of its early stage in the planning process. (It was also addressed by Dr Layton, Mrs Melhuish and Dr Leyland.) Mr Pollock identified that the proposed NPS recognised that renewable electricity generation projects can have adverse effects. Policy 2 directed decision makers to have particular regard to the constraints which exist to the ability of an applicant to avoid, remedy or mitigate effects.

[13] In our Draft Report we acknowledged the proposed NPS's overall intent – the drive to secure 90% of New Zealand's electricity generated from renewable sources by 2025.

[14] Mr Baker was critical, however, that while the preamble to the proposed NPS made the claim that its purpose was to adopt a nationally consistent approach to balancing competing values associated with the development of New Zealand's renewable energy resources, in order to provide greater certainty to decision makers, the content of the proposed statement fell substantially below that. It provided no tools or guidance to assist decision makers on assessing the weight of competing values.⁴

[15] As to the ability of MRP to avoid, remedy or mitigate effects, we were mindful that the company had:

- reduced the number of proposed turbines from its original layout design and again through its 2010 redesign to avoid or mitigate landscape, aural effects and visual amenity effects on the nearby residents;
- proposed revegetation of some 2 hectares of the wetlands in Browns Flat after the redesign, together with its initial offer of replanting 75 hectares of plantation forest;
- attempted to promote the concept of an environmental offset against potential adverse effects from the proposal outside the RMA consenting process through its eco-park arrangement but this has failed so far because of the uncertainties implicit around the arrangement;
- promised restoration and rehabilitation of the native vegetation that would need removal during the construction period for the placement of the turbine platforms and their associated roading in the Reserve, but in our view this was somewhat limited because:
 - if not narrowed as a result of smaller cranes becoming available (as discussed in Chapter 5 of this report), compacted road pavement would need to remain at 10 metres wide for 35 years (or possibly longer) to safely accommodate

⁴ Baker, EIC para 38, citing *Remit* by Zone 3 Council to Local Government New Zealand together with PNCC's submission to the Board of Inquiry on the same point.

the maintenance cranes and large turbine components that the activity will require;

- any rehabilitation of the berms immediately to prevent rapid weed invasion and edge effects of the 10-metre wide road would require deconstruction and reconstruction to 6 metres wide at the end of the consent; we do not consider this double handling is efficient;
- extended consents may be sought later in life of the wind farm;
- numerous large concrete foundations will be left buried in the Reserve forever, the sites of which by their very nature will be unable to be rehabilitated or revegetated to their present state;
- in respect of the pine plantation, which suggested 75 hectares of rehabilitation overall, all, as we identified in Chapter 8, the evidence points to the fact it is regenerating naturally and successfully in any event and should be left to do so;
- considerable concern around the development of Game Ridge as expressed by Dr Blaschke and acknowledged by Mr Shaw who considered the rehabilitation above would be sufficient mitigation;
- a proposal for the alternative environmental offset for the rehabilitation of some of the wetlands of Browns Flat had still to be developed and agreed.

Board's Response to MRP's Comments on the Draft Report Relating to the National Policy Statement on Renewable Electricity Generation 2011

Introduction

[16] The National Policy Statement on Renewable Electricity Generation 2011⁵ (NPSREG) was gazetted on 14 April 2011 and came into force on 13 May 2011. It sets out a preamble, an objective and policies to enable the sustainable management of renewable electricity generation under the RMA.

Issues

[17] The issues arising on the NPSREG are as follows:

- Whether the Board could consider the operative NPSREG at all given the requirements of s148(4) RMA?
- Whether the Board's Draft Report conclusions would be affected by the amended provisions?

⁵ National Policy Statement on Renewable Electricity Generation, New Zealand Government, New Zealand.

[18] We advised the parties of the implementation of the NPSREG in a memorandum dated 30 May 2011 inviting responses from other parties in relation to MRP's comments on the Draft Report and Mr Henry's statement on the operative NPSREG, which was appended to that document.

[19] Those parties who responded on this document (some without specific legal advice) are footnoted below. We appreciate that they took the trouble to do so (albeit under different guises such as memoranda, letters, submissions, responses).

[20] Some submitters drew attention to the retrospective nature of the NPSREG in regulatory terms – and its timing after the inquiry was considered closed (except for some procedural matters). Others sought compensation for the effects of the wind farm on their amenities.

[21] After we address the provisions of the NPSREG (below) we address those provisions raised by MRP, PNCC and HRC, the New Zealand Wind Energy Association, and a small number of other submitters.⁶

Provisions of the Operative NPS

[22] The Preamble to the NPSREG states that 'central government has reaffirmed the strategic target that 90 percent of electricity generated in New Zealand should be derived from renewable energy sources by 2025 ... providing this does not affect security of supply'. The Preamble observes further that in some instances the benefits of renewable energy generation can compete with matters of national importance under s6 and with matters to which decision makers are required to have particular regard under s7 RMA.

[23] The Objective to the NPSREG requires recognition of renewable electricity generation activities as nationally significant by providing (inter alia) for development so that the proportion of electricity generated from renewable energy resources increases to a level that meets or exceeds the Government's national target.

[24] The following particular policies are identified either in the comments by MRP on the Draft Report or in the statement of Mr Henry filed with MRP's document.

[25] Policy A of the NPSREG requires recognition of and provision for the national significance of renewable electricity generation activities, including the national, regional and local benefits (set out) relevant to renewable electricity generation activities.

[26] Policy B a), b) and c) identify some practical implications of achieving New Zealand's target for renewable electricity generation. Policy B a) and b) refer to existing renewable energy activities and are not applicable here. Policy B c) requires decision makers to have particular regard to meeting or exceeding the

⁶ #9 Huatau Marae, #92 Adams T, PNCC, #179 Dixon P, #231 Horizons, #536 Adams R, #686 Mildon A, #538 New Zealand Wind Energy Association, #87 Mildon R, para 11.

Government's national target for the generation of electricity from renewable resources that will require significant development of such activities in the future.

[27] Policy C1 under a heading 'Acknowledging the practical implications of achieving New Zealand's targets for development of electricity generation' is concerned with the location and development of new electricity generation activities included Policy C1 a) the need to locate the renewable electricity generation activity where the renewable energy resource is available. Policy C1 b) requires that particular regard be paid to the logistical or technical practicalities associated with (inter alia) the development of renewable energy activities. Policy C2 requires decision makers to have regard to offsetting measures or environmental compensation, including measures or compensation which benefit the local environment and community affected, where effects cannot be avoided, remedied or mitigated.⁷

[28] The remainder of Policy C1 d) and e), and Policies D, E, F and G do not relate to the further issues put by MRP, were not addressed by Mr Henry and nor Mr Fraser Clark, chief executive of the New Zealand Wind Energy Association.

Evidence and Discussion

Should the Board consider the NPSREG at all?

[29] We referred to PNCC's submission on this issue⁸ but considered that, as an RMA decision maker, the Board was required to have regard to the operative NPSREG in making its final decision on the *Turitea* wind farm as a matter of law – see ss104(1)(b)(i) and 88A RMA. (Appendix 3 to this Final Report.)

[30] The Interpretation Act 1999, s5(1), (2) and (3), states the meaning of an enactment must be ascertained from its text and in the light of its purpose. In ascertaining the meaning of any enactment, 'indications' of intent maybe considered, and include the preamble, headings, diagrams, graphics and so on. If the same principle can be applied to the NPSREG, we consider the Preamble in the NPSREG is an indicator of the Government's intent when setting out the more substantive provisions on renewable electricity generation activities.

[31] Mr Henry places considerable emphasis on the 90% target and 2025 cut-off date given in the Preamble, drawing also on their inclusion in documents such as the *New Zealand Energy Strategy to 2050: Towards a Sustainable Low Emissions Energy System* (October, 2007) (the Energy Strategy)", and *New Zealand Energy Efficiency and Conservation Strategy* (NZECS).⁹

[32] The Objective in the NPSREG, however, while recognising the national significance of renewable generation activities, was amended to delete explicit reference to 90% renewable energy electricity production by 2025 as set out in the

⁷ See NPSREG 2011, p5.

⁸ Maassen, Counsel for PNCC, *Palmerston North City Council's Response to the Board's Minute Dated 30 May 2011*, paras 23–24.

⁹ Henry, Appendix 1 to MRP's Comments Document, Second Statement, paras 3.13–3.21 ('Second Statement').

draft NPS, due to the fact ‘that there may be changes to the target figure or date in the future’.¹⁰ Mr Henry, discussing the energy studies, advises that 90% of energy generated from renewable resources by 2025 is ‘now aspirational’.¹¹

[33] Nevertheless, the Preamble also identifies that the contribution of renewable electricity generation towards addressing the effects of climate change, regardless of scale, plays a vital role in the wellbeing of New Zealand, its people and its environment. This was not identified by Mr Henry but was identified by counsel for PNCC in its response to the Board’s memorandum of 30 May 2011.¹²

[34] Mr Clark, responding in support of MRP’s comments and statement on the NPSREG (the Preamble) states that the Draft Report allows ss6 and 7 RMA matters to ‘trump’¹³ renewable electricity generation ‘which is not what the NPSREG envisages’. We assessed that relevant part of the Preamble and do not accept Mr Clark’s interpretation of what it says. The Preamble acknowledges that the benefits of renewable energy can ‘compete’ and ‘coincide’ with areas of significant heritage values, landscapes, vegetation and amenity values, and that there can also be conflicts with Māori relationships with their taonga. We consider that the text of this part of the NPSREG rightly recognises that there will be conflicts and competition over the uses of the resources and values involved. But what Mr Clark fails to take into account is that ss6, 7, 8 inform s5 RMA and that the NPSREG is *subject to* Part 2 Matters under s104(1) RMA – as a matter of law: see s104(1) RMA.

[35] Mr Henry discusses the NPSREG only very briefly. He points out that it provides strong support for projects such as *Turitea* with an emphasis on the national benefits to be gained from the development of renewable energy projects as set out in Policy A.¹⁴ Mr Clark considers that we did not sufficiently take into account these benefits. But the RMA requires the benefits to be also considered under the provisions of s3 (positive and future effects), and ss7(i) and (j) RMA. The benefits as per the NPSREG are an inclusive list and most, as the Board acknowledges in the Draft Report, were identified throughout the evidence of the company’s witnesses (such as Drs Heffernan and Layton, Messrs Wong Too, Henry and Pollock) and they were identified also in MRP’s closing submission.¹⁵ These positive benefits were summarised in Chapter 19 of the Draft Report.¹⁶

[36] Dr Paul Dixon, in his further submission on the NPSREG, focuses on Policy A b), emphasising that the maintenance or increasing security of supply is more assured through (inter alia) diversifying the *location* of electricity

¹⁰ National Policy Statement for Renewable Energy Generation 2011. *Summary of Board of Inquiry Recommendations and Minister for the Environment’s decision*. New Zealand Government (Ministry for Environment) p9.

¹¹ Henry, Second Statement, *New Zealand Energy Strategy to 2050* (NZES) para 3.14.

¹² Maassen, Counsel for PNCC *Palmerston North City Council’s Response to the Board’s Minute Dated 30 May 2011*, para 24.

¹³ #538 New Zealand Wind Energy Association, ‘Comments’, para 4.

¹⁴ Henry, Second Statement, Appendix 1, paras 3.8–3.11.

¹⁵ Price, MRP’s Closing Submission (noted in the footnote of Chapter 19-4 of the Draft Report). Draft Report, para 15.

¹⁶ Draft Report, Chapter 19, para 29.

generation.¹⁷ If the wind drops in the Manawatu it will be blowing elsewhere in New Zealand where there are excellent wind resources. In his opinion, to place another wind farm next to several others in the Manawatu will *decrease* the security of electricity supply.¹⁸

[37] Chapter 2 of the Draft Report (and this Final Report) notes that the Manawatu's overall wind farm capacity as a proportion of New Zealand's consented wind farm energy is about 26%. Currently the generation of electricity from wind represents about 5% of New Zealand's overall energy generation capacity. In round terms, therefore, the combined Manawatu wind farms represent less than 1.5% of New Zealand's overall energy generation, and security of supply should not be an issue. We refer also to our finding in Chapter 4 of the Draft Report (and this Final Report) that the Board is not a modern-day electricity planning committee, deciding what generation capacity is necessary, what kind of generation plants should be built (other than setting an upper limit on the terms of the consent); and that our responsibilities do not include reaching a conclusion by comparing the proposal before us with some other hypothetical consenting proposal.¹⁹

[38] MRP, referring to Policy B c), comments that in order to meet the targets of 90% renewable energy by 2025 as set out in the NPSREG Preamble, decision makers should 'not only grant consents to all renewable energy projects, but must ensure as far as possible that the project for which they grant consent is viable'.

[39] The policy in fact requires having 'particular regard' to the fact that 'meeting or exceeding the Government's national target for the generation of electricity from renewable resources will require the significant development of renewable electricity generation activities'. That appears to encourage further such developments given the concerns around climate change and meeting New Zealand's obligations under the Kyoto Protocol about which we were given a factual analysis by Mr Henry (now dated) – nothing more.²⁰ It does not stretch nearly as far as considerations of 'economic viability', although one submitter considers it does but the problem is there is no definition of 'viability'.²¹

[40] Turning to Policy C1 to which Mr Henry's statement²² and MRP's comment both refer, the NPSREG also requires decision makers to have 'particular' regard to the need to locate the renewable electricity generation activity where the renewable energy resource is available – such as the Tararua Ranges. Mr Clark states we did not take into account the need to locate the renewable generation activity where the renewable energy resource is available.

[41] We acknowledge the importance of Policy C1, and our Draft Report (and this Final Report) acknowledges that too in a whole chapter devoted to the topic²³

¹⁷ #179 Dixon P, p3.

¹⁸ Draft Report, Chapter 2, para 4.

¹⁹ Draft Report, Chapter 7, para 70.

²⁰ Henry, Second Statement, Appendix 1, paras 3.4–3.5.

²¹ #92 Adams T.

²² Henry, Second Statement, Appendix 1, p7, and MRP Comments on NPSREG, C, p22.

²³ Chapter 2, paras 1–22.

– as long as the proposal meets the requirements of sustainable management. At the outset of the Draft Report we acknowledged (after pre-reading all the evidence and undertaking several site visits) that there should be some renewable energy wind farm development on the site.²⁴ That statement was labelled ‘pre-determination and bias’ by one submitter²⁵ but may be seen as one indication on the *evidence filed*, and pre-read, that MRP’s proposal was not taken *at all* lightly.

[42] Mr Clark also alleges the Draft Report did not take into account the practical constraints of the project (as set out in Policy C1 b) and c) of the NPSREG), such as the need to connect to the national grid and access from the roading network. In Chapter 4 of the Draft Report²⁶ (and this Final Report), the Board specifically acknowledges the proximity of the *Turitea* site to the national grid and the centre of electricity demand. Meanwhile, the need to take into account roading access both from Kahuterawa and South Range Roads was the subject of considerable evidence and cross-examination. It is therefore a nonsense to say we did not take into account constraints around those two physical access routes. Kahuterawa Road and Greens Road are now subject in this Final Report to a number of conditions which reflect the need to have these roads managed safely and sustainably to adequately reflect the needs of the residents *and* MRP during the construction period.

[43] As to South Range Road, its availability through PNCC land was never questioned by the Board. We took it as read that this road was an efficient use of a physical resource for access to the wind farm and to the landowners’ land at the southern end of the site. In fact, it compared more than favourably (apart from its incursions into ecological areas) with some of the exhibits provided as examples by objecting submitters of the huge roading works that contributed to the *Project West Wind* and *Te Apiti* projects. Particular attention was also given to the requirements of the water catchment access road and the two severe realignments required for turbine access. That a number of the proposed turbine zones along the boundary with Hardings Park adversely affected both the ONL and significant ecological vegetation in that location was accommodated in the Draft Report with alternatives to meet the construction constraints of the wind farm and provide access to pastoral land for further turbines. Those alternatives were put back to MRP. The company’s response has been accepted and is now part of this Final Report. That they have been retained, reinforces Messrs Wong Too and Pollock’s evidence that the wind resource indicates a very high wind value at this location and overrides a number of s6 matters in the interests of sustainable management – a fact contemplated in the NPSREG Preamble.

[44] As for the transmission towers, their route has only been finalised in this Final Report. The Draft Report:

- recognised MRP’s need to link the turbines to the substation and then to the national grid at Linton;²⁷

²⁴ Draft Report, Chapter 19, paras 28–29.

²⁵ #686 Mildon A, Comments on Draft Report, Introduction, paras 3–5.

²⁶ Draft Report, Chapter 4, para 64.

²⁷ Ibid, Chapter 5, paras 11–16.

- recognised MRP's need to site the substation on Browns Flat;²⁸
- sought confirmation that the sites for the Turitea Reserve cross-valley transmission towers will be constructed by hand, with helicopters being used for the delivery of all labour, construction, equipment and materials.²⁹

[45] In comments to the Draft Report, Mr Shilton, a submitter, sought a reconsideration of the transmission route as an alternative by MRP.³⁰ In its reply, MRP took this into account (to its credit) but signalled it could not provide for the Shilton alternative because of practical and environmental difficulties. This has been subsequently recognised by the Board in this report and final decision.

[46] Turning then to Policy C2, this is of considerable interest – it requires if residual environmental effects cannot be avoided, remedied or mitigated, the decision makers are to have regard to offsetting measures or environmental compensation which benefit the local environment and community affected. MRP comments that the ecological mitigation MRP proposes to undertake at Browns Flat takes this approach. And we agree.

[47] In our Draft Report we considered MRP should approach the Percy family, who we found to be adversely affected by the project on the eastern side of the range, with the concept of compensation in mind. This has since been offered by the company and has been confirmed to the Board in a letter dated 7 June 2011 by the Percys' solicitors after the NPSREG was introduced. We are unclear what form this 'measure' or 'environmental compensation' has taken, but commend MRP for advancing it in accordance with the new policy.

An Operative NPSREG – A Different Result from that in the Draft Report?

[48] The second question we asked under the heading *Introduction* at para 17 above, still remains to be answered. Would we come to a different result in the Draft Report if the final NPSREG had been before us? On the information provided by the additional comments and submissions and second statement of Mr Henry on the NPSREG we conclude that that answer is no.

[49] First, we recognised that renewable energy activities are a nationally significant issue. The RMA s141B invokes it as such.³¹ Second, we recognise that *Turitea*, regardless of its more modified scale, will make a contribution to New Zealand's renewable electricity generation. The NPSREG welcomes the introduction of any scale of wind farm.³² *Turitea* in its entirety with 60 turbines, like *Project West Wind* (with 62), may be classed as a medium- to large-scale

²⁸ Draft Report, Chapter 5 para 10.

²⁹ Ibid, Chapter 20, para 3, second bullet point.

³⁰ #283 Shilton. MRP, Memorandum, *Mighty River Power's Comments Responding to the Board's Memorandum of 30 May 2011*, paras 1–7.

³¹ Draft Report and Final Report, Chapter 1, paras 2–3.

³² NPSREG, Preamble.

range of scales for wind farm development, and this issue was the subject of a whole chapter in the Draft Report. Third, *Turitea* is located in an area which has exceptional winds, which Mr Wong Too identified as internationally and nationally important.³³ Fourth, MRP already has observed that where residual environmental effects cannot be avoided then the ecological mitigation the company proposes to undertake at Browns Flat is an example of the approach taken in the NPSREG. Under this heading also, we recognise the compensation made to the Percy family.

[50] Finally, as counsel for PNCC submits (in response to our 30 May 2011 memorandum), an NPS does not prevail over the RMA statutory purpose as acknowledged in the Draft Report and decision on the *Upper North Island Grid Upgrade Project* (September 2009), reported and decided also under s149 RMA. The decision in that case summarised the relevance of an NPS in terms of the purpose of Act and principles in Part 2 as follows:

Subject to Part 2, the NPS is to be applied by decision-makers under the Act, but not as a substitute for, or to prevail over, the RMA's statutory purpose or the statutory tests. It is a relevant consideration to be weighed along with other considerations in achieving the sustainable management purpose of the Act. The objectives and policies of the national policy statement are intended to guide decision-makers in considering requirements for designations for transmission activities and in making decisions on resource consents.³⁴

Finding on NPSREG

[51] We have therefore concluded that while the final NPSREG is more explicit and helpful than the PNPSREG and we give it greater weight accordingly, none of the differences identified would materially change the emphasis that we had already placed in our Draft Report and decision on the issues surrounding renewable energy and the benefits of combating climate change.

The Manawatu-Wanganui Regional Policy Statement

[52] The Regional Policy Statement (RPS) was made operative in August 1998. Mr Pollock identifies this document includes a number of relevant objectives and policies including those related to renewable energy and greenhouse gas emissions.

[53] The following is taken from his evidence as to issues associated with the sustainable management of energy resources. He identified the objectives and policies that relate to 'air', identifying of particular relevance, namely:

³³ Wong Too, EIC para 8.8.

³⁴ Maassen, Counsel for PNCC, *Palmerston North City Council's Response to Board's Minute Dated 30 May 2011*. Final Report (September 2009), *Upper North Island Grid Upgrade Project*, para 221.

Objective 19A:

To reduce greenhouse gas emissions in the Region.

Policy 19A.1:

To promote measures which achieve a reduction in greenhouse gas emissions in the Region.

Objective 28 is as follows:

To promote the sustainable management of energy resources.

[54] Mr Baker, for PNCC, considers Objective 28 provides primary support to MRP's proposal.

Policy 28.1:

To promote the sustainable supply and use of energy resources to meet the needs of the regional community.

Policy 28.2:

To promote the increased use and development of renewable energy sources where practicable.

[55] Mr Pollock identifies the evidence of Dr Layton is that the Turitea wind farm will make a significant contribution to New Zealand's electricity supply, while also displacing up to 1.1 million tonnes of CO₂ per annum, but that was before the redesign. After the redesign, he assessed the amended proposal as reducing the:

- overall installed capacity from a maximum of 336MV to 288MW and greenhouse gas emissions avoided by between 79,000 tonnes and 334,000 tonnes;
- estimated value of greenhouse gas benefits to New Zealand each year by between \$1.7 million and \$11 million; and
- direct and indirect benefits for the Manawatu and Palmerston North in particular during the construction period.³⁵

[56] Dr Layton confirmed that, under the original MRP proposal, the wind farm would provide an efficient source of energy compared with other sources. And he further confirmed that even under the revised layout.³⁶

[57] The RPS also recognises that energy generation can have adverse effects.

Objective 29 is:

To avoid, remedy or mitigate the adverse effects of energy generation in the Region.

³⁵ MRP, *Turitea Wind Farm Assessment of Environmental Effects* – Turitea Wind Farm Redesign, para 3.1.

³⁶ Ibid.

[58] Mr Pollock provided an overview of his assessment of the nature of adverse effects. Basing it on the conclusions of the experts and the policy framework, he considers the proposal to be consistent with this objective. Mr Baker for PNCC considers that the proposal does not meet Objective 29 because there are significant adverse effects still associated with the proposal even after the redesign.

[59] One of the methods which the RPS promotes to implement the policies is method 28.2, which is to promote the efficient use and management of energy resources and the adoption and use of renewable energy resources where appropriate. In that:

- PNCC changed the purpose of the Reserve to accommodate renewable energy generation, and MRP wishes to take advantage of this;
- MRP wishes to capture the availability of a world-class wind resource to promote the sustainable supply and use of energy resources;
- MRP has redesigned the layout of the wind farm to provide for greater appropriateness in its context;

then, to this extent, MRP has adopted this method.

[60] Whether this particular wind farm will meet the needs of the regional community is a moot point because we heard evidence that the Manawatu is already well supplied with energy from existing wind farms. Given that *Turitea* appears to be placed as a foremost wind resource, however, it will nevertheless provide strong back-up at the regional level as well as providing to the national grid even in a modified form after the redesign.

[61] In regard to Objective 19A and Policy 19A.1, we agree with Mr Pollock that Dr Layton's evidence-in-chief stands as unchallenged – that is – *Turitea* will provide significant savings in particular with respect to CO₂ emissions, which is important relative to New Zealand's obligations to reduce them.³⁷ Mr Hindrup, for HRC, overlooks this provision.

[62] For many of the potential adverse effects we have identified in other chapters of this report, we agree with Mr Pollock, that because they are able to be avoided, remedied or mitigated, they are consistent with the Objective 29. And in Chapter 19, Part 2 Matters, we include a summary of the benefits of the project as set out by Mr Pollock.³⁸ There are, however, a number of adverse effects remaining which relate to landscape, visual amenity and ecological matters that are not able to be suitably remedied or mitigated and, depending on our Part 2 analysis, may need to be avoided altogether.

[63] After agreeing at the caucus what plan provisions were relevant to the project, Mr Hindrup provided a list of what he considered were relevant

³⁷ Pollock, EIC paras 130–131, citing Layton EIC.

³⁸ Ibid, EIC paras 274–285.

objectives and policies omitted from Mr Pollock's evidence.³⁹ But Mr Hindrup did not provide any interpretation or application of these so they are identified here. Mr Pollock's responses are as follows:

- Objective 3 and related policies, relating to the relationship of nga iwi with their ancestral lands, water, sites, waahi tapu and other taonga. I have already assessed such matters in my primary evidence, and consider the addition of these objectives and policies does not require any further comment or evaluation.
- Policies 5.4, 8.2, 15.1, 16.2 and 35.2 I have already addressed the 'overarching' objectives to which all of these policies relate in my evidence-in-chief.
- Objective 13 and Policy 13.1 regarding maintenance of groundwater quality. I do not consider this objective and policy are particularly relevant. On the basis of the evidence in particular of Messrs Levy and Watson, I also consider such matters have been adequately taken into account and addressed in the context of the present applications.
- Objective 19 and Policy 19.1 relate to maintaining or enhancing air quality in the region. I did not identify these in my evidence-in-chief because in my opinion the adverse effects on air quality are de minimis.
- Objective 34 and Policies 34.1 and 34.2 relate to the length of duration of resource consents. These have been considered in seeking 35 year terms for consents from HRC. However, I note that in my interpretation, Policy 34.1 does not apply to this activity, and so Policy 34.2 is most relevant.

Land Use and Water Issues

[64] As to sustainable land use and water management in the RPS – Mr Pollock identifies:

Objective 5:

To achieve sustainable land use.

Policy 5.1:

All land in the Region shall be managed sustainably. In particular the adverse effects of land use activities resulting in a significant:

- a. loss of soil from subsidence, landslip or erosion; or
- b. loss of soil structure ...
- c. degradation of water quality shall be avoided, remedied or mitigated

³⁹ Hindrup, EIC para 34, Appendix B.

Policy 5.4:

To promote riparian management practices that will avoid, remedy or mitigate the adverse effects of land use activities on water quality.

Objective 11:

To maintain or enhance surface water quality.

Policy 11.2:

To avoid, remedy or mitigate the adverse effects of point source discharges, in particular, adverse effects caused by:

- a. biochemical oxygen demand (to reduce growth of sewage fungus);
- b. suspended sediment discharges (to improve water clarity and aquatic habitat);
- c. particular organic matter (to improve aquatic habitat);
- d. bacterial contamination (to reduce the risk to human health);
- e. dissolved reactive phosphate and dissolved nitrogen, whichever is limiting (to control growths of filamentous algae);

Objective 11A

To avoid, remedy or mitigate the adverse effects of land use on water quality in lakes, rivers and streams.⁴⁰

[65] In his assessment at the outset of the first hearing, Mr Pollock considered the proposal was consistent with these objectives and policies.⁴¹

[66] On the question of water quality, we consider Mr Pollock's conclusion at the time he made it (before the first hearing) was not quite accurate. From our analysis in Chapters 7, 8 and 9 we have since concluded that MRP, has, in conjunction with the other relevant experts, proposed adequate measures for mitigating any adverse effects which might account for sediment loss to the water of the Turitea reservoirs and the streams which flow into the Manawatu River. Together with the additional positive effects of the redesign (such as the proposed restoration of some of the riparian margins of Browns Flat), the finalised conditions and the various management plans lead us to conclude that Objectives 5, 11 and 11A are satisfied.

[67] In terms of Policy 11.2, MRP has not proposed any point source discharges for the project but has, we consider, nevertheless given specific attention to policy 11.2 a, b and d as precautionary measures (see Chapters 7 and 9 of this report). In this regard we observe that, in terms of any risk to the Turitea water catchment and its reservoirs, 'a precautionary approach' does not preclude a 'no risk regime'. We agree with Mr Pollock that the approach of the experts on water quality issues now taken to sediment management (the soil disposal sites have been moved outside the reserve), and with the conditions agreed as best practice, it is unlikely the proposal will have adverse effects on water quality.

⁴⁰ Pollock, EIC para 53.

⁴¹ Ibid, EIC paras 132–134.

[68] We recognise also, that for a project of this scale and sensitivity, the iterative process that took place through caucusing was entirely appropriate and the parties who undertook that process are to be commended for the detailed attention given the very significant issues around water and land management in question for this particular site (see earlier chapters).

Significant Features, Landscapes and Skyline Issues

[69] Mr Pollock identified landscape and visual amenity issues in Chapter 22 of the RPS as contained in Objective 8 and Policy 8.3:

Objective 8 To protect natural features and landscapes which are outstanding and regionally significant from inappropriate subdivision, use and development.

Policy 8.3: To protect, from inappropriate subdivision, use and development, the specified values associated with the following features which are both outstanding and regionally significant:

- p. The skyline of the Tararua Ranges, specifically:
 - i. its scenic qualities provided by its prominence throughout much of the Region and its backdrop vista in contrast to the Region's plains.
- q. The Tararua Forest Park, specifically:
 - i. its recreational and ecological values, contributing to the national conservation estate (our emphasis).

[70] Mr Pollock identifies that, in addition, the RPS goes on to provide further discussion in relation to the skyline of the Tararua Ranges under the following:

Explanation:

The Tararua Ranges extend from north of Upper Hutt to the Manawatu Gorge. The skyline is prominent throughout the lower North Island, and provides a scenic vista separating the east and west coasts.

The skyline of the Tararua Ranges is an outstanding natural feature or landscape of regional significance as it meets criteria of Policy 8.1. The values and attributes of the ranges which contribute to its significance, and are to be protected, are listed in Policy 8.3. The skyline is defined as the boundary between the land and sky at the crest of the highest points along the ridge. The skyline of the Tararua Ranges is the land/sky boundary as viewed at a sufficient distance from the foothills so as to see the contrast between the solid nature of the land at the crest at the highest points along the range and the sky.⁴²

⁴² Pollock, EIC paras 136–137.

[71] It is HRC's case that the site is an outstanding and regionally significant landscape. (Messrs Wyatt, Brown and Pollock in their responses to HRC challenge this.) Mr Hindrup considers this is a matter which should be argued only at the HRC Proposed One Plan (POP) hearings and not in this application, Mr Hindrup observes that the RPS has been in place for 10 years and has not been challenged. Accordingly, in an ONL/ONF regional context, the inquiry is required to decide whether *Turitea* is an appropriate or inappropriate development. In this context, Mr Hindrup focuses on Policy 8.2 which was only generally cited by Mr Pollock.⁴³ In his rebuttal evidence, however, Mr Pollock states he addressed Policy 8.2 in his evidence-in-chief in assessing the 'overarching' objectives to which this policy relates.⁴⁴

[72] In reviewing this statement, we note that Mr Pollock maintained that the specific objectives and policies on sustainable management of energy resources provide a high level of support for the wind farm.⁴⁵

[73] Basing his evidence on that of Messrs Wyatt and Brown, Mr Pollock concluded that neither the highest ridgeline nor any other aspect of the landscape that comprises the *Turitea* site constitutes an ONL, therefore the proposal is not inconsistent with the RPS provisions he identified which were Objective 8 and Policy 8.3. He found this group of provisions of the RPS difficult to interpret, and the fact that the district plans have not sought to take that interpretation any further, did not help.⁴⁶ He relies particularly on the evidence of Mr Brown where he discusses the diminishing sense of values in the landscape as the viewer moves south to north.⁴⁷ Mr Pollock also considers Policy 8.3 requires interpretation and is simply unclear.⁴⁸

[74] Mr Brown, in his analysis of these provisions, considers many of the features addressed in the RPS lie well to the north and west of the study catchment. And after addressing the provisions of the POP (see below) he concludes:

- that he has been much more precise than HRC in the identification of parts of the Ruahine and Tararua Ranges he considers outstanding and, in particular, he considers the northern terminus of the Tararua Ranges together with the hill sequence between the Manawatu Gorge and Pahiatua Track too modified to qualify as truly natural and outstanding;⁴⁹
- the definition of outstanding landscape in the POP is extremely crude; it does not reflect the manner in which the landscape unfolds

⁴³ Hindrup, EIC paras 40–42.

⁴⁴ Pollock, RE para 12, second bullet point.

⁴⁵ Ibid, EIC para 140.

⁴⁶ Ibid, NOE 3798.

⁴⁷ Ibid, 3804.

⁴⁸ Ibid, 3797.

⁴⁹ Brown, EIC para 63, second bullet point.

on the ground or the way in which it is perceived by the regional council because it compartmentalises the landscape.⁵⁰

[75] Nevertheless, as counsel for PNCC, Mr Maassen's questioning of Mr Pollock⁵¹ prompted us to make a different analysis of three policies in question, not just the one – namely all Policies 8.1, 8.2 and 8.3. We did this in the context also of the prompts contained in the 'explanation', 'reasons' and 'methods' that are set out in the statement to inform the assessor. We note here we are also indebted to the legal submissions from HRC, which were of great assistance.⁵²

[76] The RPS identifies both significant landscape issues and the region's outstanding landscapes and natural features. The following extracts from the RPS identify those key landscape 'assets' in closer proximity to the subject site:

22.2 Overview of Significant Issues

Landscapes, habitats and the natural and cultural heritage values associated with them give the Region its character. This character is inherently subjective and requires individuals to interpret what they see around them against their own belief systems and experiences.

Landscapes

Landscape is the most immediate symbol of the Region's natural character. It is a visual impression of the interaction of people on their environment, consisting of natural habitats and habitats modified by people for their own uses. It is not a static background that we inhabit, but the interaction of a society and the habitat in which it lives. Inevitably, the landscape changes if either people or the habitat changes. Landscape has physical (landform and feature), ecological (dynamic, natural) and cultural (induced change) components.

Landscape values change over time as resource use activities modify the environment. The once commonplace can become highly valued as particular elements become more scarce. Others are lost altogether. For example, early Palmerston North was a small settlement in a clearing the size of three modern dairy farms. The prominent landscape in photos of the time is of a few inconsequential buildings surrounded by an imposing rimu and totara forest. It is doubtful whether the locals valued this vista at the time, when the prime concern was clearing land for timber and farming. Today, the forest has all but gone, and imposing tower buildings surrounded by a large urban area dominate the landscape. Most people do not value or remark on this vista, despite the complete contrast with the one of a century earlier. Each represents the character of Palmerston North at the time; the collective cultural memory has changed with the landscape.

⁵⁰ Brown, EIC para 65.

⁵¹ Pollock, NOE 3801.

⁵² Blomfield, HRC Closing Submissions, paras 17–40.

[77] The following issues and policies were not addressed by MRP:

Issue NCF1	Loss or degradation of regionally significant natural features and landscapes.
Issue NCF2	Loss or degradation of significant habitats of indigenous flora and fauna.

[78] We consider it is clear that Policies 8.1 and 8.2 are the key to any assessment of Policy 8.3 and we set them out as follows:

Policy 8.1: To consider the following matters when identifying which natural features and landscapes are outstanding and regionally significant:

- a. with respect to major geographical and geological features or landscapes, the degree to which it contributes to the Region's character in terms of:
 - i. visual prominence; and
 - ii. scenic characteristics, including views, vista and backdrops; and
- b. the feature or landscape's ecological significance in terms of:
 - i. its importance as a habitat for rare or unique species; and/or
 - ii. its importance as an area of indigenous flora; and
- c. the cultural or spiritual significance of the site or areas to tangata whenua; and
- d. special or important amenity and intrinsic values, including scientific, cultural and recreational values, of the area to the Region; and
- e. the degree to which the feature or landscape has recognised national or regional protection. (our emphasis)

Policy 8.2: To protect regionally significant natural features and landscapes which are outstanding from inappropriate subdivision, use and development. In determining inappropriate subdivision, use and development the following will be taken into account:

- a. the degree to which activities would adversely affect the values specified in Policy 8.3 so far as those values provide a significant contribution to outstanding features and landscapes; and
- b. the degree to which the activity provides for the social or economic well-being of people and communities, (including providing essential services to the public); while ensuring that, in all cases, adverse effects of any activity on the features or landscapes are avoided, remedied or mitigated.

[79] To the Explanation needs to be added the following:

22.3.2 Methods to Implement Policies

The Regional Council shall:

Method 8.1

Recognise and provide for the protection of outstanding natural features and landscapes in regional plans and when considering applications for resource consents.

District Councils should:

Method 8.2

Provide for the protection of outstanding natural features and landscapes in district plans and when considering applications for resource consents.

22.3.3 Explanation

These policies provide a management framework for identifying and protecting outstanding features and landscapes in the Region so decision-makers can recognise and provide for them when making resource use decisions. The policies provide for the protection of the specific values and attributes of features and landscapes in the Region which make them regionally significant, and therefore outstanding. By providing for the protection of these values and attributes, the features and landscapes themselves will be protected.⁵³

Policy 8.1 provides the criteria for identifying the regional significance of the features and landscapes. Policy 8.2 provides for the protection of those identified regionally significant features and landscapes. Policy 8.3 identifies the values of certain features which are to be protected in terms of criteria identified in Policy 8.1. The fact that other features have not been included in Policy 8.3, or have been excluded from Policy 8.3, does not mean that the Regional Council may not in future determine that those features satisfy the criteria in Policy 8.1.

22.3.4 Reasons

The policies address issue NCF1 and reflect Section 6 of the Act. The Regional Council has prepared the list in Policy 8.3 in consultation with District Councils and the Department of Conservation. In doing this, the Council has taken the word “outstanding” to mean natural features and landscapes which are of regional significance. In some cases these features and landscapes may also be of national and/or international significance.

Each feature or landscape on the list has been assessed in terms of the criteria in Policy 8.1. The outstanding natural features and landscapes identified in the list have been included for the following reasons etc.

[80] When identifying landscapes or features, we note that Policy 8.1 discusses that various criteria apply in the process of identification. They are not to be overlooked with a ‘fast forward’ to Policy 8.3 from the relevant objective. At the same time, we also acknowledge Policy 8.3 is not a great piece of Chancery drafting. Deeming the skyline in that policy as an ONF, only becomes

⁵³ Pollock, NOE 3796. The witness acknowledges he looked at the whole of the RPS and would not isolate any particular part – if there was not any sense from the policy one would look to the explanation.

clear if the steps in the explanation are applied, which requires an examination of the criteria in Policy 8.1. If these are found to be met, the appropriateness of the relevant activity in the context of an ONF can be considered (Policy 8.2) depending on the extent to which it affects the values in Policy 8.3.

[81] Recognising that only rules have the force of regulation under regional and district plans (see s76(2) RMA), we consider here that all relevant provisions of the RPS require close examination in their context, including those relating to ‘Issues’ which highlight or inform the loss or degradation of significant landscapes and natural features, and the loss of habitats of indigenous flora and fauna that is taking place in the region. These have to be assessed in the context of ‘appropriate use and development’ under Policy 8.2 as identified by Mr Hindrup.⁵⁴

[82] The RPS also requires in Policy 8.2 a. an assessment of the *degree to which* a feature or landscape contributes to the region’s character in terms of its visual prominence and scenic characteristics – including views, vistas and backdrops. Having determined that, the policy then requires an assessment of the *degree to which* an activity would affect those values.

[83] As stated by Mr Wyatt, this policy was the subject of specific comments in the *Motorimu* decision, where the Court expressly found that ‘the feature that Objective 8 seeks to protect is the very highest skyline of the Tararua Ranges, not the foothills skyline containing the *Motorimu* site’.⁵⁵

[84] With the greatest respect to the finding of that court we are not sure that Objective 8 applies only to the highest skyline of the Tararua Ranges but take note here of Ms Lucas’ finding and also those in Ms Williams’ statement that regardless of definition, elements of the proposed wind farm are visible on a skyline in every photomontage supplied by the applicant.⁵⁶ We nevertheless begin our analysis in the context of Objective 8, as set out above, and the comments of the findings of the Court in *Motorimu* on Policy 8.1. We assess the Turitea Reserve and its immediate surrounds in the order of the issues that Policy 8.1 provides and also as provided for in Method 8.1 ‘when considering applications for resource consents’.

[85] We note neither Mr Brown, Ms Lucas nor Mr Bray support the *wider* Turitea wind farm site as an ONL because of the foothill developments or the modifications to the natural character of the northern part of the site (our emphasis). We support their conclusions and their reasons given in that regard. It is a matter of where the boundaries of the ONL may be drawn and it is not around the foothills and the plantation near the Pahiatua Track, the development of which Mr Brown and others consider militates against considering the whole *Turitea* site as an ONL.⁵⁷

⁵⁴ Hindrup, EIC para 42.

⁵⁵ *Motorimu Wind Farm Limited v Palmerston North City Council* [Environment Court] Decision W067/2008, paras 112–118.

⁵⁶ Williams, s42A Report, p10.

⁵⁷ Brown, Exhibit 10, *Preliminary Assessment of Landscape and Amenity Effects*, 2006, pp6–7.

Policy 8.1 a: Major Geographical and Geological Features or Landscapes

[86] Policy 8.1 requires consideration of a number of issues by which a natural feature or natural landscape is assessed to arrive at an answer as to its significance or otherwise. They include major geographical and geological features of landscapes, the cultural significance of the site, special values and, finally, the degree to which the feature or landscape has regional or national protection. Once these issues are determined it is possible to move on to those policies that follow.

[87] Messrs Baker and Pollock agree that the Turitea Reserve and pastoral outliers on the site are not categorised in the RPS framework (neither RPS nor the POP) as an ONL⁵⁸ – based on the landscape evidence presented by Messrs Wyatt, Brown and Anstey. Ms Lucas' evidence for TAG and FOTR – that the Turitea Reserve is an ONL and the skyline is an ONF – is not addressed by the planners. Mr Baker, however, considers that the middle part of the Turitea Reserve, including Game Ridge, is an ONF. Mr Shaw sees that area of indigenous vegetation stretching south along the reserve to the Tararua Forest Park and Hardings Park as a s6(c) matter (which refers to the protection of areas of significant indigenous vegetation).⁵⁹ Mr Brown considers the Turitea Reserve to be outstanding as an ONF, but only when seen from within.⁶⁰ Messrs Bray and Anstey arrived at a similar view confirming this under questioning. (We have already addressed these opinions in Chapter 12 and repeat them here only to provide a foundation from which to address the policy's requirements.)

[88] The following matters that reflect the region's character are taken largely from the evidence of Ms Lucas and Mr Bray identifying major geographical/geological features of the location in which the Turitea Reserve is situated, and which in turn may contribute to their visual prominence and scenic characteristics. We also perceive this may assist in determining whether the RPS is correct in identifying the Turitea Reserve skyline as an ONF. Mr Wyatt recognises the Tararua and Ruahine Ranges to the north with their central spine rising several hundred metres – 1,500 metres in the south on a broad alluvial plain. As such, the landscape is clearly divided between the plains and the steeper ranges and has the unusual feature of rivers running parallel to the ranges, leading to convoluted drainage patterns.⁶¹

[89] Ms Lucas under 'Natural Science' factors, identifies that central New Zealand involves basement rocks, from the Tararua Ranges down to Mount Cook, that are gradually rising. Alongside Palmerston North, the axial ranges are very narrow and these she identifies as the structural core or backbone to the lower North Island.⁶² On its eastern side, the axial range is bound by the abrupt fault-line scarp of the Wellington Fault. The fault scarp to the west is less evident due to the

⁵⁸ Pollock, RE para 20. See also *Beca Planning Expert Report*, para 3.4 *Outstanding Natural Landscape*.

⁵⁹ Shaw, NOE 581–582.

⁶⁰ Brown, NOE 3077.

⁶¹ Wyatt, EIC 7.1–7.2.

⁶² Lucas, EIC para 21.

influence of marine processes (attachment 10 *Manawatu Land Types*) due to the fact the axial ranges were formerly submerged and emerged as coastal boundary. ‘This is evident with the marine benches cut into the flanks of the ranges’⁶³ (attachment 26, Figure 11.2A). As a result, the Tararua Range summit is rather flat lying at between 400–500 metres above sea level where the axial range is narrow and the crest line sags down to 600 metres in a saddle, veneered with marine strata.⁶⁴

[90] After providing a quotation from *Landforms of New Zealand* about geological peneplain, Ms Lucas describes the wind farm site as a very old flat surface, traditionally interpreted as a terrestrial peneplain (or perhaps a platform shorn by marine transgression), extending from south-west Wellington north along the greywacke band to the Manawatu Gorge. She explains most of that surface has been eroded away in ensuing millennia except for some fragments in the south Tararua Range and at the north around the Manawatu Gorge. Ms Lucas then sets out the characteristics of the peneplain of the northern part of the Tararua Range which demonstrate its rarity, stating:

Considering the windfarm site north from Marima displays a remnant of a ‘peneplain’ landform surface. As viewed from beyond (attachments 14-17) *the horizontal skyline* from Marima north to the Gorge is a demonstration of this ancient formation that is scarce in the North Island [our emphasis].⁶⁵

[91] Mr Bray, under the heading ‘Geological Values’, states in regard to major geographical or geological features:

The Ranges as a whole unit are typical of the faulting and uplift caused by the colliding of the Australian and Pacific tectonic plates. The higher parts of the Ranges are significant in terms of their steep peaks (and signs of glaciations), and the [Manawatu] gorge for its geological uniqueness. The main ridgelines running between each of the Forest Parks, and *particularly the skyline*, rate highly as a dominating geological feature of the landscape. The foothills are less important geologically, but nevertheless the gently rolling hills of particularly Bryant Hill and Te Mata and deeply incised valleys have an important contrast to the flat terraces and plains [our emphasis].⁶⁶

[92] The forest parks referred to here are the Tararua Forest Park to the south of Marima and the Ruahine Forest Park to the north of Manawatu Gorge.

Finding

[93] On the evidence above (which was unchallenged) we find the main ridgeline and skyline along the Turitea site is a major geological/geographical

⁶³ Lucas, EIC, para 22.

⁶⁴ Ibid, para 23.

⁶⁵ Ibid, para 25.

⁶⁶ Bray, EIC para 69.

feature in its setting and, because of this, contributes significantly to the region's character. Of note is the reference in both statements of evidence of the experts' rating of the skyline as either a demonstration of the ancient peneplain (which presents as a flat marine terrace) or a dominating geological feature.

Policy 8.1 a. i and ii: The Tararua Ranges, Visual Prominence and Scenic Characteristics

[94] The second part of Policy 8.1 is the degree to which the major geological (natural) feature or natural landscape contribute to (inter alia) the site's scenic characteristics and visual prominence, including views, vistas and backdrops.

[95] Mr Wyatt describes the area of the Tararua Ranges across the site as having high amenity value in the context of s7 RMA.⁶⁷ This assessment is based primarily on the importance of the range's skyline, their ruggedness and the presence of patches of vegetation. Nevertheless, Mr Wyatt considers only a small area of the ranges will be affected by the proposal, through the landscape's sensitivity and capacity to absorb change.⁶⁸

[96] Mr Brown localises the Turitea Reserve in the context of other features. He describes the dark mantle of forest along the crest of the range from the Turitea Reserve southwards to the Tararua Forest Park and also up to almost the Pahiatua Track as reinforcing the feature's sense of naturalness associated with the main ridge core sequence, thus provisionally recognising the Turitea water catchment as part of this. He also observes it is sizeable in its physical extent (close to the Pahiatua Track).⁶⁹ We note here no turbines have been removed by MRP from the spine of the range along the Turitea Reserve, although some were relocated during the redesign.

[97] Mr Bray considers that both the Tararua and Ruahine Ranges form a key part of the North Island's main axial divide, providing a strong and important contrast to the fertile plains to the west and the alluvial river-filled valleys to the east. He considers the *Turitea* site is in the central part of the Tararua Range and as such is visually inescapable and visually distinctive from the northern section of the range containing other wind farms. While not as dramatic as the southern section, he says that 'the landform provides a significant scenic backdrop that separates the east and west coasts and is particularly important in framing the identity of the Manawatu landscape on the western side'.⁷⁰

[98] Mr Bray also identifies the several dominant peaks that are adjacent to or in the site, 'Kaikinau' (near Tokomaru), 'Marima' (located within the subject site) and the most dominant 'Arawaru' (767 metres), which marks the approximate boundary between the Reserve and Hardings Park within the southern section of the wind farm. He notes, too, the most defining elements of the upper areas of Kahuterawa Valley are their upper parts, which are deeply incised into the

⁶⁷ Wyatt, EIC paras 8.29–8.32.

⁶⁸ Ibid, para 16.21(a)(b).

⁶⁹ Brown, EIC para 52.

⁷⁰ Bray, EIC para 42.

foothills and, as such, define and contrast the surrounding landforms, with each valley containing notable native vegetation. Included in his significant scenic backdrop is the increase in the bulk of the foothills including Bryant Hill and the area around Browns Flat. These, he considers, tend to make the ridgeline (the highest) appear more recessed than it actually is north of the Pahiatua Track. Mr Bray also notes that Hardings Park and Turitea Reserve are located both on the upper ridges and in a hidden gully of this section of the ranges. Both these protected areas allow a continuation of the sequence of indigenous vegetation from higher locations that cover the southern section of the ranges.⁷¹

[99] Mr Baker, in describing the spatial extent of the project, identifies it consumes all of the Tararua Ranges landscape adjacent to Palmerston North and is located very close to patterns of urban developments in the Aokautere area, and the Turitea and Kahuterawa valleys. He also observes the Turitea Reserve is a major component of the site, with ecosystems of high ecological value located adjacent to Hardings Park, which in itself is a Scenic Reserve (although we note the park unlike the Reserve is not readily visible from the plains). Mr Baker observes the Turitea Reserve forms a dominant natural feature for Palmerston North residents, while the project site is situated over land that ranges in elevation approximately 240 metres above sea level through to approximately 610 metres. This indicates a wide topographical range which, when viewed from the plains, presents as a cascade of turbines across all elevations.⁷²

[100] Mr Baker points out that the orientation of many of the major roads is north-west to south-east, which is oriented towards the Tararua Ranges as are views from Fitzherbert Avenue when travelling south west from the Square. Mr Baker says he would be surprised if there is any major or arterial road that does not have significant views of the Tararua Ranges in that orientation.⁷³ In addition, numerous properties and commercial buildings located within the city enjoy views of the ranges. Many residents within the wider Aokautere area, the Turitea and Kahuterawa Valleys, also consider that the ranges are a key element in the landscape.

[101] We take the word ‘their’ in Policy 8.1a.i (visual prominence and scenic characteristics) as referring back to the major geographical/geological features that contribute to the region’s character as identified above. These include, as a fact, the skyline. We are reminded that Ms Lucas states:

To locate the skyline land that is being considered, RPS 22.3.4 page 112 identifies that “The skyline is defined as the boundary between land and sky at the crest of the highest points along the ridge. The skyline of the Tararua Ranges is the land/sky boundary as viewed at a sufficient distance from the foothills so as to see the contrast between the solid nature of the land at the crest at the highest points along the range and the sky”. This clarifies that the “skyline” is not the upper

⁷¹ Bray, EIC, paras 52–53. Ms Lucas is also a witness providing the cultural names to the peaks of the Tararuas, which reflects the evidence also given by Mr Te Rangi for Huatau Marae.

⁷² Baker, EIC paras 24–26.

⁷³ Ibid, EIC para 26.

surface when viewed from close in, for these form the foothills to the range, rather than the highest crest. It is the summit of the main range.

Rather than describing the highest crest in words, the watershed delineates the centreline to this crest (appendix 2). The skyline is more than this centre line, it is the summit land surface of the range as viewed from beyond. On this ‘peneplain’, the land surface forming the skyline involves a broad summit. To address the skyline as a backdrop from out on the plains, a broad summit is being referenced. This applies for views from both east and west.

A core component of a skyline is the space above the junction of land and sky, the skyscape. Due to the large scale of the structures, as is clearly evident in Mr Wyatt’s simulation images (and in the K2vi simulation seen at caucus, and referred to by Ms Williams at 2.82), many of the proposed turbines would protrude into the skyscape. The turbines protruding into the skyscape directly affect this skyline ONL.⁷⁴

[102] Ms Lucas assesses ‘legibility’, which we take as one aspect of the visual prominence of the features already identified. She states that the fault-controlled range block on which the Turitea wind farm is located is clearly legible, particularly from the east, rising abruptly through the alluvial plains. In contrast to the dissected range to the south, the peneplain landform is legible north from Marima. The flat-topped range has identifiable peaks associated with the dissection into its surface. This dissection into parallel ridges is clearly legible (Lucas attachment cover and attachment 27 *Landform of the Manawatu* (on right)). This witness describes the length of the Tararua Ranges within Palmerston North City and south of Pahiatua Track ‘as involving a series of long-recognised “peaks” along the watershed separating the waters flowing east to the Manga Hao River, and those flowing west to the Turitea Stream and the Kahuterawa Stream’ (attachment 9 *Turitea Reserve Ecological Management Areas*). The changing natural vegetation in response to exposure and altitude is, Ms Lucas considers, clearly legible (attachment 30 *Turitea Reserve Vegetation*). The witness considers the legibility of a number of the subtle peaks on the peneplain landform would be adversely affected by the earthworks and the number of large structures made up of 122 turbines originally. Even after the redesign (at 104 turbines) these will still be spread 12 kilometres along the Tararua Ranges, from Pahiatua Track south to Kahuterawa Valley, and extending over 5 kilometres across the western to eastern flank of the range.

[103] Ms Lucas also identifies that while Palmerston North is proximate to six consented wind farms which are visible from around the city, they are generally located away from the main vistas and not located at the end of the street vistas. She notes that *Turitea* will be entirely and prominently in line with these. We note views of *Te Apiti* are gained along Main Street, but that it lies slightly south of direct alignment and is considerably more distant than *Turitea*. Ms Lucas also notes that the city of Palmerston North is laid out in a grid pattern with one set of streets oriented directly to the Pahiatua Track–Arawaru length of the Tararua Ranges (attachment 13 *Palmerston North City grid vistas*). Confirming this

⁷⁴ Lucas, SE paras 15–17.

evidence, Mr Baker makes the point that the 12-kilometre wide *Turitea* site is effectively a ‘window’ to the city with viewshafts of the site being possible from a high number of streets due to the north-northwest–south-southeast grid plan layout of the city.

[104] Mr Brown acknowledges that it is clear that the proposal would change the fundamental balance between the developed and more natural areas on the range. He considers that, as a result, the basic structure and patterning of the northern Tararua Ranges landscape would be significantly modified. He acknowledges some would see the wind farm as an incursion into part of the Tararua Ranges that presently remains relatively natural and, in places, also displays a strong and endemic character. He goes on to say:

To a degree, this would also reduce the interplay between the immediate urban confines of some locations (exemplified by Viewpoints 10 and 11 at The Square and in Fitzherbert Ave) and the more natural/rural values resident in visible parts of the Tararua Range and Turitea Reserve. Ultimately, therefore, the proposal raises important questions about Palmerston North’s relationship with the Tararua Range (as well as that of other local settlements) and the Range’s role as a ‘signature’ backdrop feature.

For those viewing the wind farm from more remote locations, such as SH2 south of Pahiatua or closer to Feilding and Linton, the predominantly rural nature of the visible landscape – from the immediate foreground to the top of the Tararuas – would also be affected by exposure to the wind farm. As a whole, the landscape would lose some of its sense of continuity. The interaction between hill country and plains/valleys, between pasture and bush, open fields and shelterbelts, etc would be diminished by the presence of these very powerful structural elements.⁷⁵

[105] Mr Brown’s descriptions at times are very powerful and fair.

Finding

[106] We agree there is a clear relationship spatially between the ranges and the city.⁷⁶ And we agree the visual prominence and scenic characteristics of the Tararua Range in the location of the Turitea water catchment provide a signature backdrop feature both to Palmerston North City and the Manawatu Plains.

⁷⁵ Brown, Exhibit 10, *Preliminary Assessment of Landscape and Amenity Effects. Precis* (2006) pp7–8.

⁷⁶ Lucas, NOE 1463.

Policy 8.1 b.ii: The Feature or Landscape's Ecological Significance in Terms of its Importance as a Habitat for Rare or Unique Species and/or its Importance as an Area of Indigenous Flora

[107] Under Chapter 8, we have examined the significance of the ecology of *Turitea* and do not revisit that discussion in terms of 'rare or unique species'. Alternatively, under RPS Policy 8.1 b.ii we are required to assess the site's importance as 'an area of indigenous flora'. Mr Shaw's opinion is that the water catchment area of the Turitea Reserve has areas of significant native vegetation as does Game Ridge but the rest of the reserve site is only made up of horopito scrub, which he variously describes as having 'very high' 'high' or 'moderate value'.

[108] Mr Pollock referred to the fact that Mr Shaw had identified a scale of significance of the vegetation affected (ie, in some of the deeper gullies and around the water catchment areas where there are large tawa forests that are untouched). Mr Pollock was questioned whether that means the less significant parts of the Reserve that have been cleared and are now regenerating such as Game Ridge (Western Ridge) may simply be disregarded. In questioning, he agreed this is not an option, but considered on the evidence of the experts, and the additional mitigation provided in the redesign with riparian planting around Browns Flat, that there will be a net benefit to the environment with the ecological restoration proposed.⁷⁷

[109] Under the heading 'Biodiversity', Ms Lucas observes:

The vegetative cover of the Pahiatua Track to Arawaru landscape is very intact. The extensive native vegetation (attachments 11 and 30) demonstrates natural patterns, processes and elements. Highly intact, dense shrubland responds to the exposed elevated environment. The extensive and largely intact vegetation has important natural science value.⁷⁸

[110] We experienced for ourselves on our site visits to the top of the Turitea Reserve (and beyond), the extensive native vegetative cover layering over what appears, in our experience, to be a very unusual landform deeply incised and dramatic contributing to an outstanding ONF and ONL (when incorporating the skyline). Our assessment was also informed by Lucas' attachment 11 *Landcover Database 2*.

[111] It is quite clear that despite the historic modifications to the *Turitea* site from:

- fire, predators, the odd pastoral clearance and the peripheral scrappy pine forest; and
- the water catchment area access road –

⁷⁷ Pollock, NOE 3787.

⁷⁸ Lucas, EIC para 27.

that there is a continuum of significant indigenous vegetation that stretches from the water catchment area down as far as Hardings Park into Tararua Forest Park, and that this should be protected from inappropriate use and development if possible. We note that during the planning caucus the experts recorded that, in the context of the relevant regional plan in the RPS, that in relation to Land Use Consent 104553, the planners indicate that the Board should be aware that the notification of consent incorrectly noted that the vegetation and clearance and land disturbance was to occur in ‘a rare or threatened habitat’. The caucus say this is not the case – that it was agreed prior to notification and again at the caucusing of the three planning experts that, based on the evidence provided at that time, it is an ‘at-risk’ habitat.⁷⁹ But that label is not relevant to what we are discussing here, which is whether the Turitea water catchment area down to Hardings Park is an area of significant indigenous flora in terms of Policy 8.1b ii. We have concluded it is on its facts and on the evidence provided by Mr Shaw.

[112] We adopt here the question which was asked by the Environment Court in *Project West Wind* involving a coastal environment as to whether it was better to wait for the inner coastal lands to fully regenerate before they are designated ‘outstanding’. In that decision, the Court found it ‘was essentially a [question of] fact’ whether that call could be made or not.⁸⁰ On the Turitea water catchment of which the reserve is a part, and of which a portion is significant regenerating horopito scrub, we do not consider that we have to wait for its further growth for the ecological area of the reserve to be identified as outstanding. We agree that, if left untouched for a further 50-year growth period, the current vegetation associated with the Turitea water catchment access road would lead to a tangible increase of secondary forest up towards the higher parts of the reserve.⁸¹

Finding

[113] The vast majority of the Turitea Reserve, despite its minor modifications, through to Hardings Park and the Tararua Forest Park, is an important area of ecological significance in terms of its indigenous flora which brings it within the ambit of s6(c) RMA, the requirement to recognise and provide for the protection of areas of significant indigenous vegetation.

Policy 8.1c: The Cultural and Spiritual Significance of the Site or Area to Tāngata Whenua

[114] We do not intend to address this matter here, as the issues have already been assessed under Chapter 17, except to note that Ms Lucas identifies that Rangitane o Manawatu, via Tane nui a Rangi Manawatu Incorporated (TMI) note that the Tararua Range is the ‘heke’ or ‘ribs’ of the sacred fish of Maui Tikitika a Taranga, and is highly valued by many hapū.⁸²

⁷⁹ Pollock, *BECA Planning Expert Report*, p3.

⁸⁰ *Meridian Energy Limited v Wellington City Council and Amor* [Environment Court] Decision No W031/2007, paras 409–412.

⁸¹ TAG and FOTR Submissions, Appendix E 18–19.

⁸² Lucas, EIC paras 42–43.

Policy 8.1d: Special or Important Amenity and Intrinsic Values (Including Scientific, Cultural and Recreational Values)

[115] These criteria were not specifically addressed by any of the planners so we looked to the landscape and ecological witnesses to address the ‘intrinsic’⁸³ and ‘scientific values’ touched upon by them, ‘important amenity’, ‘cultural’ and ‘recreational values’ being otherwise satisfactorily addressed elsewhere under Chapters 8 and 12.

[116] Dr Blaschke identified:

Indigenous biodiversity is recognised as being greatly reduced throughout the Manawatu-Wanganui region (HRC 2007a). Horizons Regional Council has identified threatened and at-risk habitat types throughout the region using analysis that overlaid Land Environments of New Zealand (LENZ; Leathwick et al 2003) (level IV) and predictive vegetation models. It is based on the concept of rarity derived from a comparison of original extent compared with current extent. Turitea Reserve does not appear to fall within a threatened LENZ environment at a broad scale (Fleur Maseyk, Horizons Regional Council, pers. comm. 29 April 2009).

[But] at the regional scale, the broadleaf-podocarp forest occurring within the Turitea Reserve is identified as a threatened habitat within Horizons Regional Council Proposed One Plan (One Plan). The forest is not directly affected by the proposed activities with one proviso . . . [Game Ridge]. The horopito-dominated forest occurring widely throughout the wind farm site, and most significantly affected by the proposed activities, is not identified as a threatened habitat in the One Plan.⁸⁴

[117] In discussing biodiversity on the site, Ms Lucas identified that the vegetative cover of the Pahiatua Track to the Awaruru landscape is very intact. The extensive native vegetation (attachments 11 and 30) demonstrates natural patterns, processes and elements. She notes that highly intact, dense shrubland responds to the exposed elevated environment. She also states the extensive and largely intact vegetation has important natural science value.⁸⁵ Drs Coffey and Joy also discussed s6(c) significant fisheries matters around the Turitea catchment and streams.

[118] When intrinsic values are considered in relation to landscapes, Mr Anstey explores the meaning of the ranges and Turitea Reserve to the local communities. He links the amenity values currently enjoyed by these communities and their quality of life, finding that a central part of their identity comes from their relationship with the local landscape. The intrinsic values pertaining to this landscape therefore contribute to their wellbeing and community sustainability.⁸⁶

⁸³ See definition in Appendix 1 to this report.

⁸⁴ Blaschke, EIC paras 3.12–3.13.

⁸⁵ Lucas, EIC para 27.

⁸⁶ Anstey, EIC paras 29–32, 36.

[119] We recognise the sensory values that the ranges have and how these contribute to the intrinsic values experienced by people. As Mr Brown notes, the understanding of associational values is an area that he recognises requires community contribution, referencing the need for local input in determining intrinsic values associated with, for example, Māori cultural values. Mr Anstey responds by suggesting that how individuals and communities see and experience the particular place they live is always unique to them, and any generalisation of values and meanings can be offensive.

[120] Mr Bray also considered such values, citing local people's references to the influence of the ranges on weather patterns and to the moods of the ranges and hills – how they change colour as the sun passes over them and the shadows catch the folds of the gullies. Bryant Hill, Te Mata and, to some extent, the slopes above Ngahere Park can glow from the illumination of the afternoon sun.⁸⁷

[121] Although, as Ms Lucas says, the RMA is tenure neutral, there is a clear legal framework providing protection to varying degrees of the Tararua Ranges and the Turitea Reserve.

[122] The effect on intrinsic values reinforces the more quantifiable effects found to exist, and discussed in other chapters, in relation to the matters listed in 8.1.d. While intangible, also, the presence of intrinsic values contributes to the sense of place that is appreciated, particularly by local residents who live in and appreciate the sensory qualities of their community's environment. These local associations can be unique to the particular place they live, and any generalisation of values such as may occur through wider community perception studies can overlook the local meanings and can be extremely offensive.

[123] We do not consider that Game Ridge and the spurs off the Back Ridge of the water catchment access road should be disturbed, for the reasons given in Chapter 8. Turbine construction zones, roading access and concrete platforms are inappropriate development in this context given the importance given in the RMA of ecological and biodiversity issues.

[124] Hardings Park Ridge, because of its recreational values, demonstrates some of the 'intrinsic values' identified under s2(b) RMA. They, too, are affected adversely by what is proposed.

[125] The wind farm site, including the Turitea Reserve, has important scientific and intrinsic values that will be adversely affected by the proposed development.

Policy 8.1e: The Degree to which the Feature or Landscape has National or Regional Protection

[126] Tararua Forest Park, Hardings Park and Turitea Reserve all gain protection to varying degrees under the Reserves Act 1977. Tararua Forest Park comes under the control of the Department of Conservation, while Hardings Park

⁸⁷ Bray, EIC para 69.

and Turitea Reserve both fall within the auspices of the PNCC. Hardings Park is classed as a Scenic Reserve, while Turitea retains its classification as a Water Reserve. Ms Lucas comments on the reserve status of Turitea.⁸⁸

An 868 ha area, referred to as Hardings Park but perhaps not with surveyed boundaries, was gazetted in 2003 as Scenic Reserve as per s.19(a) of the Reserves Act (attachment 9). The rest is a Local Purpose Reserve having the protection and management of scenic features as a “Secondary objective” (Turitea Reserve Management Plan, TRMP Pt 2 1.2 Table 2).

The scenic values are not to be protected only for the interests of City residents or the City Council. Scenic Reserves have “*the purpose of protecting and preserving in perpetuity for their intrinsic worth and for the benefit, enjoyment and use of the public, suitable areas possessing such qualities of scenic interest, beauty, or natural features or landscape that their protection and preservation are desirable in the public interest.*” Also, “*by providing, in appropriate circumstances, suitable areas which by development ... will become of such scenic interest or beauty that their development, protection, and preservation are desirable in the public interest.*” (section 19(1)).

Classified as per s. 19(1)(a) Hardings Park is to enable protection and preservation of “*suitable areas possessing such qualities of scenic interest, beauty, or natural features and landscape that their protection and preservation are desirable in the public interest*”. As identified in s.2(c).

[127] Policy 8.3 deems the skyline to be outstanding and of regional significance, with specified values which are also to be protected from inappropriate use and development as a matter of national importance. A purposive statutory interpretation is required of this deeming provision because all other relevant provisions in the chapter guide the route to be taken in assessing the feature as requiring protection. Otherwise, on its own, it is difficult to make sense of. In the context of the prior provisions and the relevant evidence, where appropriate, it allows contextual analysis to apply Policies 8.1 and 8.2 as well as the Objective 8 and Policy 8.3.

[128] We find it useful to refer to *Powell v Dunedin City Council*, a case providing interpretation to a rule which required assistance from objectives, policies, methods and other sections of the plan to arrive at a sensible conclusion. The Court of Appeal held:

As this Court made clear in *Rattray*, regard must be had to the immediate context (which in this case would include the objectives and policies and methods set out in section 20) and, where any obscurity or ambiguity arises, it may be necessary to refer to the other sections of the plan and the objectives and policies of the plan itself. Interpreting a rule by a rigid adherence to the wording of the particular rule itself would not, in our view, be consistent with a

⁸⁸ Lucas, EIC paras 97–99.

judgment of this Court in *Rattray* or with the requirements of the Interpretation Act.⁸⁹

[129] We consider this is a case where other sections of the plan and policies other than just Policy 8.3 are relevant.

Finding

[130] In Chapter 12 we have found the landscape of the Turitea Reserve is an ONL as a matter of fact. Thus, it is to be protected from inappropriate use and development under s6(b) RMA as a matter of national importance. Here, we find the major geographical/geological features of *Turitea*, including the skyline under the RPS, to be regionally significant as an ONF and also to be protected from inappropriate use and development under s6(b). We also find the area of significant ecological value on the site (the water catchment area down to Hardings Park) is an ONF, as we do the related stream habitats of native fish identified by Drs Coffey and Joy in Chapters 8 and 9, to be provided for and protected as a matter of national importance under s6(c). As such, we note they are not qualified by the term to protect ‘from inappropriate use and development’ as are the s6(b) matters but they must be provided for and then protected. We consider, however, in terms of *Turitea*-related streams habitat, MRP in its water management plans and conditions of consent does provide for and protect them as a matter of national importance. But the matters of ecological value remain to be finally decided under Part 2 issues.⁹⁰

Policy 8.2: To Protect Regionally Significant Natural Features and Landscapes which are Outstanding from Inappropriate Development

[131] Under this heading, the decision maker is to determine what is inappropriate development by:

- considering the degree to which the activities would adversely affect the values specified in Policy 8.3 (prominence, scenic qualities and backdrop vista) so far as those values provide a significant contribution to the ONF and ONL; and then to consider
- the degree to which the activity provides for the social or economic wellbeing of people and communities (including essential services to the public), while ensuring in all cases adverse effects on features or landscapes are remedied, avoided or mitigated.

[132] This policy is more general than Policy 8.3, which requires protection from inappropriate use and development of the specified values relating to the skyline (which we have found to be an ONF), and Turitea Reserve (as an ONL).

⁸⁹ *Powell v Dunedin City Council* [2004] 3 NZLR 721, para 35.

⁹⁰ See Chapter 19.

[133] While Mr Wyatt considers the scenic qualities of the skyline will be protected, he also concludes the turbines in fact will showcase it and enhance its prominence. While we agree that turbines may enhance its prominence, we do not agree that such enhancement would protect its scenic qualities.

[134] The relevant objective, issue and policies also provide for landscapes in the RPS to be protected. As a matter of fact, Ms Lucas has established the Turitea Reserve landscape down to Hardings Park to be outstanding. It cannot be compared at all with the significant amenity landscape we viewed on the site at *Te Apiti* nor the rounded hills which support the other adjacent wind farms.

[135] But there is a difficulty with the wording of Policy 8.1.e. It infers a hierarchy of protection, ie, do the features listed have national or regional protection? The whole of New Zealand would need assessing if this was the case. In s6 matters, is not whether there is a hierarchy for the identification of national, regional and district landscapes inbuilt into s6. The whole point of the section in this particular case is that where outstanding natural features and landscapes, and areas of significant indigenous vegetation, and significant habitats of indigenous fauna are identified, either through plans or as a matter of fact,⁹¹ they are to be 'recognised and provided for as a matter of national importance'. Findings of fact may not be challenged, and we have found the finding of the RPS to be correct on the facts before this Board.⁹² The skyline about *Turitea* has therefore to be recognised and provided for as a matter of national importance.

[136] Ms Lucas identifies that the large-scale structures are clearly evident in Mr Wyatt's simulation images and the K2vi simulations.⁹³ The turbines protrude into the skyline and their movement will draw the eye away from the feature's scenic values. The exhibits of Mr van der Leden (a witness for PNCC) are useful in that they depict the Turitea Reserve areas with yellow shading and Hardings Park as blue. This makes them clearly apparent whereas, depending on weather conditions, the on-ground visual experience of these features can be variable in an area where transient values are strongly valued by the residential submitters.⁹⁴ In addition, the turbines on the lower ridgelines, such as Love Ridge, also project into the skyline: see Lucas attachment 17 *Wyatt public viewpoint 01 Kingsgate Hotel – right half of Turitea turbines*. Mr Brown considered (fairly) that the consistent manner in which WT132 and WT133 would intrude into views as being prominent/dominant was unacceptable.⁹⁵ The intrusive effect from the remaining turbines on Love Ridge, however, even after the redesign, becomes more apparent the further out into the Manawatu Plains from which viewpoints are taken. We took note of Mr Pollock's unexpectedly considered opinion that both Bryant Hill

⁹¹ *Chance Bay Marine Farms Ltd v Marlborough District Council* per Doogue J. [2000] NZRMA 3 (ENC) para 27 and *Unison Networks Limited v Hastings District Council* (HC) CIV2007-485-896 per Potter J.

⁹² *Stark v Auckland Regional Council* [1994] NZRMA337 (HC).

⁹³ PNCC, Van der Leden, Exhibits 28A and 28B.

⁹⁴ See submitters as identified here: #301 Low, NOE 1847; #258 Adams, NOE 2249; #544, Christiansen, NOE 2302; #87 Mildon 2435; #591 Nixon, NOE 2595. See also Lucas, EIC paras 37–38.

⁹⁵ Brown, SE para 22.

and Love Ridge are prominent foothills which appears to follow Mr Bray's evidence rather than Mr Brown's.⁹⁶

[137] Unlike Mr Wyatt, Mr Pollock agreed too that an ONF remains one – no matter how many times it is viewed – it is where it is viewed from that is the issue.⁹⁷ We note while an ONF may also be part of a landscape issue, as an ONF, it also exists in its own right to be protected from inappropriate use and so on if identified. It is the explanation to Policy 8.3 which requires it to be seen from a certain distance.

[138] We find as a fact that the Turitea Reserve is seen in various aspects from Palmerston City and the Manawatu Plains. The geological features, and the hills underpinning such a large expanse of native vegetation flowing into the deep valleys, the bird life, the native fish in the feeder streams, the clear waters of the reservoirs all combine to give the reserve a marked distinction in its own right.⁹⁸

[139] Subject to what we state under Part 2 matters, we do not consider that the adverse effects of the wind farm on the ONF (the skyline), the significant ecological area in the reserve and the ONL (Turitea Reserve landscape) can be mitigated to provide adequate protection from turbine placements, access roading and concrete platforms affecting these areas.

[140] As to the degree the activity provides for the social or economic wellbeing of people, including essential services to the public, the redesign of the turbines has brought some social benefit in terms of amenity to the foothills communities. And, even with the redesign, there is economic benefit to MRP and some of the landowners although Messrs Waters and Love want the turbines removed in the redesign reinstated for both the energy and economic benefits they bring.

[141] Without doubt, too, the proposal also provides economic security to the greater public through its contribution to sustainable energy for the national grid and its potential impact on climate change issues and displacement of carbon emissions from energy sources elsewhere. We consider in Chapter 12, however, residual concerns around turbine locations, access roading and concrete platforms in the ONL and on the ONF remain. The adverse effects of these structures require avoidance. Even after the redesign, there remain some locations in which the wind farm is inappropriate.

[142] When Mr Baker was asked whether 'protection' meant 'prohibition' of development on the skyline, he was in agreement it did not. After the redesign, he was satisfied that because the internal qualities of the Turitea Reserve do not become dominant until beyond WT15, the 28 turbines which he had identified would now be acceptable to PNCC instead of the original 10. He

⁹⁶ Pollock, NOE 3794.

⁹⁷ Ibid, 3850.

⁹⁸ As noted in Chapter 8, Coffey, EIC paras 3.14 and 4.14, describes that the upper Turitea Stream and the Kahuterawa Stream support very high-quality aquatic habitat that is highly sensitive to reduced water quality/suspended loads. He also considers the headwaters of the Kahuterawa, Otangane and Tainui Streams, and Palmerston North water supply reservoirs are significant habitats of indigenous fauna in terms of s6(c) RMA.

provided a dotted blue envelope line on Exhibit 36 to demonstrate the acceptable area, which included the original 10 supported turbines (May 2009) and an additional 18 turbines (February 2010). The original 10 turbines on the ridgeline are acceptable because of the extensive modifications to natural character that exist around the Pahiatua Track area.⁹⁹

[143] We agree in part with Mr Baker’s proposal for the reasons he gives. We accept too TAG and FOTR’s submission that, if left untouched for a further 50-year growth period, the current ONF vegetation associated with the Turitea catchment access road would provide a tangible increase of secondary forest up to the higher parts of the reserve.¹⁰⁰

Finding

[144] We are unanimous that the ecological footprint of the Turitea Reserve, which includes Game Ridge and the ecological areas covered by WT15–WT20 and WT39–WT43 (in that area seen by Mr Shaw as a s6(c) issue),¹⁰¹ should not be disturbed, as an ONF and part of the ONL (as defined by Ms Lucas), given the 50 years it has taken for this vegetation to regrow already.¹⁰² We do not consider MRP’s intent to cover these areas with turbines, access roads and concrete pads for 35 years, and possibly beyond, is sustainable. Nor do we consider that turbines on the skyline, which is a regional ONF (and also part of the ONL), are appropriate either. Both ONF and the ONL have such a degree of significance that they should be protected in the context of Palmerston North and the Manawatu Plains.

[145] But we go further than PNCC under Part 2 RMA in identifying what other turbine locations in the Reserve we consider are appropriate in this application for use and development.

Policy 8.3: Protection of the Skyline as an ONF and its Specified Values (Scenic Qualities, Prominence, Backdrop Vista) from Inappropriate Use and Development

[146] Ms Williams’ s42A Report notes that the *Turitea* site is an ONL in neither the PNCC or TDC district plans. But she also states that the regional and district plans identify the skyline of the Tararua Ranges as an ONL.¹⁰³ Mr Pollock considers that this is not correct for the following reasons:

- no operative regional plan identifies the ‘skyline of the Tararua ranges’ as an ONL, although the RPS does include objectives and policies on this point;

⁹⁹ Baker, NOE 3912.

¹⁰⁰ Submissions TAG and FOTR, Appendix E18–19.

¹⁰¹ Shaw, NOE 581–582.

¹⁰² Ibid, Lucas, R E.

¹⁰³ Williams, s42A Report, para 1.22.

- the PNCC and Tararua district plans are silent on this issue; there are no rules in them that relate to:
 - defining the skyline, or where to view the skyline for the purpose of implementing the RPS;
 - protecting the skyline; or
 - to guide the council in making decisions relating to the RPS skyline provisions.¹⁰⁴

[147] Mr Brown was asked about what he would regard as the most conspicuous part of the skyline. He responded that ‘rather than being presented by individual peaks what tends to be seen is a shallower sequence of ridges and crests which merge or coalesce rather than any one being dominant’.¹⁰⁵ He considers what that means in the context of a wind farm on such an amalgam of linear ridges is ‘that inevitably the wind farm will be seen to occupy the skyline in most respects’.¹⁰⁶ He considers the best part of the skyline to be seen is from Marima southwards as well as that Back Ridge area which has a covering of shrubland and bush or forest. In terms of the skyline, Mr Hindrup identifies for HRC that the RPS ‘skyline’ provisions are operative and beyond debate, while the POP provisions at the time of hearing were still in the process of formulation and thus can be given little weight.

[148] But while Mr Hindrup identifies that ‘interpretation’ is required around ‘what is the skyline of the Tararua Ranges’ in the RPS, Mr Pollock does not agree. He relies on the fact that as Messrs Brown and Wyatt do not consider the wind farm site to be an ONL, the skyline provisions of the RPS are not intended to apply to *Turitea* at all. Mr Pollock agrees with Mr Coombs’ evidence that merely identifying the ‘Skyline of the ranges’ is a poor way of acknowledging and protecting parts of them that are outstanding. In Mr Coombs’ opinion the scale of the Tararua Ranges and the fact they have multiple viewpoints means the provisions relating to the ‘skyline’ are too broad and ambiguous to be practical and workable.¹⁰⁷

[149] Mr Baker’s assessment is that parts of the site that contain the skyline should be considered under the RPS as being ‘outstanding’. This applies to the Back Ridge of the *Turitea* Reserve. Ms Lucas points out, in addressing Policy 8.1a, according to RPS 22.3.4, the ‘Skyline of the Tararua Ranges’ is an ONF as it meets the requirements of Policy 8.1a. What is stated in the ‘Explanation’ to the objective and policies is that the RPS deems the skyline of the Tararua Ranges to be an ONF of regional significance (that is, in the context of the Manawatu) as it meets that particular criterion.

[150] At the outset, it needs to be recognised that Policy 8.3 refers to the skyline as an ONF and not an ONL, although the skyline in this context is one feature of the ONL which was established as a matter of fact under Chapter 12.

¹⁰⁴ Pollock, SE para 20.

¹⁰⁵ Brown, NOE 1465.

¹⁰⁶ Ibid, 1476.

¹⁰⁷ Coombs, NOE 1970.

[151] Mr Brown is correct when he analyses the skyline as being seen as a shallower sequence of ridges and crests which merge or coalesce rather than any one ridge or crest being dominant. But it depends where it is viewed from, for the skyline is twice defined in the ‘Explanation’ to this set of policies.

[152] It appears that the way that Policy 8.1 is worded allows for questions of fact to be established first – to determine whether the skyline is an ONF on a regional basis. This perhaps throws a ray of light on what Mr Hindrup was saying in his evidence – that it is up to the decision maker based on the facts provided for this ‘lengthy Tararua Range’ to decide a result which is based on the values and attitudes set out in Policy 8.3. Mr Pollock recognises that there is clearly a tension between what the plan states ‘as a simple fact’ and the analysis of some of the landscape experts. But he considers that just because the RPS identifies the Tararua Range as an ONL (sic) does not mean it passes the relevant landscape tests – such as those established in the *Pigeon Bay* criteria.¹⁰⁸

[153] Putting those particular criteria which pertain to ONF and ONL under s6(b) RMA to one side, in this policy context, we focus on the Policy 8.1 criteria to assess whether they may affirm the conclusion made in the RPS that the skyline is an ONF which in a regional sense is confirmed by the specific wording of Policy 8.3 p.

[154] Policy 8.3 p. decrees the skyline (specifically) of the Tararua Ranges and its scenic qualities to be both outstanding and regionally significant. The values and attributes of the ranges which contribute to its significance are found to be so because it meets the criteria of Policy 8.1 a – visual prominence and scenic characteristics. Policy 8.3 i identifies it has scenic qualities because the skyline has prominence throughout the region and provides a backdrop vista to the plains. Other values and attributes which contribute to its significance and are to be protected are listed in Policy 8.3 itself:

- the skyline’s ‘definition’ as the boundary between land and sky at the highest points along the ridge (as seen in the evidence of Ms Lucas); and
- the values attributed to viewpoints from a sufficient distance from the foothills to see the solid nature of the land at the crest of the highest points along the range and sky (as seen from Palmerston North) and the Manawatu Plains (also as detailed in the evidence of Ms Lucas).

[155] The problem with the protection of the skyline is, as Mr Pollock identifies, that at a sufficient distance from the foothills the viewer can see the skyline (and, we add, from there appreciate so many of its transient values); sitting in the FMG stadium, however, the viewer sees another skyline and otherwise the viewer will have only glimpses of the main ridge skyline.¹⁰⁹

[156] But the directive in the RPS at least is for the skyline to be viewed at ‘sufficient distance’. From attachment 18 *Mr Wyatt public viewpoint 2*

¹⁰⁸ Pollock, NOE 3793.

¹⁰⁹ Pollock, NOE 3836.

(Fitzherbert Avenue) we can clearly see the effect of the turbines on the ONF and the ONL. And on Ms Lucas' front cover to her attachment, which gives the names of the small peaks while her attachment 24 *Wyatt public viewpoint 03 (Napier Road Looking east through to south west)* (on the plains) with coloured turbines, we see many turbines all but obliterating this distance view and significance of the skyline, acknowledging as we do so these numbers have been reduced to some extent in the redesign. Even then the remaining turbines will still obscure all the small peaks and the skyline. Mr Anstey remains concerned, even after the redesign, because of the remaining scale of the distance views of the wind farm. 'The scope of the turbines ... everyone registers as sitting on/or above the skyline.'¹¹⁰ We agree.

[157] An analysis of the RPS Explanation to Objective 8 also provides insight into policy 8.3.

Explanation:

The Tararua Ranges extend from north of Upper Hutt to the Manawatu Gorge. The skyline is prominent throughout the lower North Island, and provides a scenic vista separating the east and west coasts.

The skyline of the Tararua Ranges is an outstanding natural feature or landscape of regional significance as it meets criteria a of Policy 8.1. The values and attributes of the ranges which contribute to its significance, and are to be protected, are listed in Policy 8.3. The skyline is defined as the boundary between the land and sky at the crest of the highest points along the ridge. The skyline of the Tararua Ranges is the land/sky boundary as viewed at a sufficient distance from the foothills so as to see the contrast between the solid nature of the land at the crest at the highest points along the range and the sky.¹¹¹

[158] As noted in Chapter 12, the 'skyline' is twice defined in this explanation:

- (a) the boundary between the land and sky at the crest of the highest points along the ridge, and
- (b) the land/sky boundary as viewed at a sufficient distance from the foothills so as to see the contrast between the solid nature of the land at the crest at the highest points along the range and the sky.

[159] Ms Lucas mapped on her attachment 9 the watershed ridgeline of the Tararua Ranges, being the crest at the highest points along the *ridge* ((a) above). It is apparent that this ridge, however, is screened by higher foreground ridges in some locations, so therefore does not form the skyline. This situation occurs with Game Ridge, which screens much of Hardings Park Ridge when viewed from Palmerston North. At this point, definition (b) applies, as Game Ridge becomes part of the crest of the highest points along the *range*.

¹¹⁰ Anstey, NOE 3171.

¹¹¹ Pollock, EIC paras 136–137.

[160] The skyline definition refers to both the watershed ridge and the highest points along the range. In places they coincide. The result for *Turitea* is that where Back Ridge and Game Ridge form the skyline, they are deemed to be an ONF, which is qualified by our analysis of Policy 8.1 that also finds this to be the case from WT15 south, and reinforced by our finding in Chapter 12.

[161] For clarification, confirmation of the deeming of Policy 8.3 is necessary through Policy 8.1 and expert analysis, otherwise the ranges north of Pahiatua Track would have to be accepted as an ONF, which none of the experts argued to be the case. We therefore note Mr Pollock's approach when he argues that because MRP's experts do not find *Turitea* or its skyline to be outstanding, then Policy 8.3 does not apply. But we do not agree with MRP's experts and therefore we do not agree with Mr Pollock on this matter.

Finding

[162] Policy 8.1 guides plan writers on the matters to consider when identifying ONF, and Policies 8.2 and 8.3 are the focus for decision makers when considering resource consents.

[163] The question here, is not whether the RPS is correct to determine the skyline is an ONF, but whether what MRP proposes protects the identified values of the ONF (Policy 8.3) as explained by Policy 8.2. For all the reasons given above, we do not consider some of the turbines in the Turitea Reserve do protect those values.

Regional Plans

1. The Manawatu-Wanganui Regional Air Plan

[164] Mr Pollock sets out the following:

The Objective is:

To maintain or enhance air quality in the Region, and have ambient air quality that does not adversely affect human health and well being, animal and plant health, amenity values and cultural values.

[165] He states that the Turitea wind farm will have minimal, if any, effects on air quality. Such effects as will arise will be generated by discharges from the temporary concrete batching plant and the mobile rock crushing plant. In addition, there is potential for nuisance dust to arise during the construction process. The evidence of Dr Black is that these discharges will not cause any adverse effects on human health.

Policy 2 states:

To have particular regard to the following matters when considering resource consent applications:

- a. the effects of the discharge on:

- i. human health, safety and well-being;
- ii. health and functioning of ecosystems, plants and animals, including indigenous ecosystems;
- iii. other components of the receiving environment, including surface waters and land;
- iv. structures;
- v. ambient air quality;
- vi. visibility; and
- b. the effects of the proposed discharge on any sensitive receiving environments (refer to Glossary), in particular discharges which have adverse effects on visibility or which cause the soiling of property; and
- c. the nature of the discharge with respect to tangata whenua concerns and the effect of the discharge on waahi tapu, marae and other places or features of significance to tangata whenua, particularly adverse effects from the intrusion of odour and visual contaminants; and
- d. the outcome of consultation between the applicant and affected parties; and
- e. the results of any emission testing, ambient air monitoring or atmospheric modelling undertaken; and
- f. meteorological conditions, local micro-climates, topography and any other surrounding environmental conditions that may influence the effects of the proposed discharge; and
- g. the potential for reducing the quantity, or improving the quality, of the discharge at source and where the potential is not to be realised, the reasons for not doing so; and
- h. whether the best practicable option for the management of discharges to air is proposed or in place and where the best practicable option is not proposed or not in place, the reasons for not doing so; and
- i. the likely contribution of the proposed discharge to any cumulative adverse effect, including from the same property, that could arise over time or in combination with other effects; and
- j. any relevant code of practice and any management and maintenance systems; and
- k. the training and qualifications of the operator; and
- l. any adverse effects on cultural and historic heritage resources, having particular regard to any adverse effects on the scenic, aesthetic and recreational values associated with heritage resources; and
- m. the frequency, intensity, duration, offensiveness and location of the discharge to which the application relates; and
- n. whether the activity was legally established and/or allowed by the District Plan.

[166] Mr Pollock considers the evidence demonstrates that the matters identified in this policy can be adequately addressed. There are not considered to be any adverse effects on human health, ecosystems or freshwater, ambient air quality or visibility. The effects of the air discharges will be acceptably low as a

result, and will not result in any cumulative effects. The effects of air discharges during construction have not been raised as a major concern by submitters. Overall, the evidence of Messrs Levy and Shaw, and Drs Black and Coffey, is that the operation of both the concrete batching plants and mobile crusher and the potential “dust” and other emissions that may arise from that are highly unlikely to have adverse effects that are unacceptable on the receiving environment.

Policy 6 is as follows:

To avoid, remedy or mitigate adverse effects on amenity values, human health and well being or property arising from:

- a. the frequency, intensity, duration or offensiveness and location of odour; and
- b. the discharge of dust, smoke, or other particulate matter; and
- c. the creation of odour, dust and smoke nuisance from land use.

[167] Dust suppression will be provided on-site during construction, meaning the Turitea Wind Farm project will comply with this policy. Therefore Mr Pollock’s assessment is that the proposal is consistent with all relevant objectives and policies of this plan.

Finding

[168] We find MRP’s proposal is consistent with the relevant provisions of the regional air plan.

2. The Manawatu-Wanganui Regional Land and Water Plan

[169] Mr Pollock identifies under this plan the key objectives and policies with respect to the Turitea wind farm are:

DL Objective 3: To reduce sediment, microbial contamination and nutrient runoff to lakes and rivers.

[170] He considers the Turitea wind farm will avoid or mitigate adverse effects arising from sediment runoff. Best practice measures are identified by Mr Levy to reduce the risks associated with sediment runoff, and works are not proposed in the vicinity of the water reservoirs. The evidence is that the earthworks proposed on the site, and associated sediment laden discharges, will have acceptably low effects. Discharges from substation sites and other locations have been designed to reduce sediment and other contaminants so that any potential adverse effects associated with them are avoided. Dr Black also concludes that there will be no adverse effects on human health arising from the wind farm.

[171] It is the witness’ conclusion that the Turitea wind farm proposal is consistent with the relevant objectives and policies of this plan.

Finding

[172] Our assessment of the project construction elements also confirms Mr Pollock's conclusion in this matter.

3. The Manawatu-Wanganui Regional Plan for the Beds of Rivers and Lakes

[173] The regional plan for rivers and lakes includes Objective 3, which is as follows:

To enable the use and development of resources in, on, or under the beds of rivers and lakes, while ensuring ... any adverse effects on natural character, ecological, intrinsic, amenity or cultural values are avoided, remedied or mitigated; and the existing life supporting capacity is maintained or enhanced.

[174] Mr Pollock observes this objective recognises that some activities will need to occur in the beds of lakes and rivers. In relation to *Turitea*, this will include works over watercourses and the placement of culverts in them. Other structures, including transmission cables will also need to cross watercourses in some locations. The evidence of Dr Coffey and Mr Levy has assessed the potential adverse effects arising from these works as being very low risk and acceptable, and the project will not affect the life-supporting capacity of the relevant water courses.

[175] As noted in Chapter 9, Mr Levy also points out that the culverts will be located mainly in the steep uppermost reaches of what are typically small catchments and ephemeral streams and that fish passages are not required.¹¹²

Finding

[176] We agree with Mr Pollock's assessment that the *Turitea* wind farm proposal is consistent with the relevant objective of this plan.

4. The Manawatu Catchment Water Quality Regional Plan

[177] The Objective for the Manawatu catchment as set out in this plan is:

To enhance surface water quality in the Manawatu catchment by the year 2009 to a level which meets the needs of all people and communities while safeguarding the life-supporting capacity of the water.

[178] Mr Pollock considers Policy 8 to be the key relevant policy, which is as follows:

¹¹² Chapter 9, para 4.

To recognise that the catchment's remaining lakes and natural wetlands are particularly sensitive receiving environments when considering resource consent applications to discharge into them.

[179] He identifies the importance of natural wetlands within the catchment are recognised by the regional policy framework and this would therefore include Browns Flat. While turbines were initially proposed within the Browns Flat wetland, four turbines were removed from this location in order to avoid the potential for adverse effects on it.

[180] Mr Pollock considers that the expert evidence, in particular that of Mr Levy and Dr Coffey, indicates there will be no other adverse effect on the life-supporting capacity of aquatic communities within affected waterways. Therefore, overall, he considers that the Turitea wind farm proposal is consistent with the objectives and policies of this plan.

Finding

[181] We have already concluded under Chapter 7 that MRP has put in place measures to secure the water quality of Palmerston North's water supply. We also note, with the measures already taken around Browns Flat and both MRP's proposed conditions to partially restore some of the wetland area, that these measures are consistent with the relevant objective and policy of the water-quality management plan. We have suggested further mitigation, however, of Browns Flat.

PNCC District Plan

Section 3: Tangata Whenua and Resource Management

[182] The most relevant provisions to this proposal we consider are:

Objective 1

To acknowledge nga hapu of Rangitane as Tangata Whenua within Palmerston North City.

Policy 1.1:

To inform Tangata Whenua of all notified resource consent applications.

Objective 2

To ensure that consultation is undertaken with Tangata Whenua on resource management issues.

Policy 2.1:

To consult with regard to the identification of an appropriate protection of wahi tapu and wahi tupuna and other sites.

Policy 2.3:

To ensure ongoing consultation in communities is maintained with regard to resource management issues of particular concern to Tangata Whenua.

Discussion

[183] Mr Pollock was the only planner to give evidence about cultural issues. He had been challenged by Ms Forbes about what the ‘active protection’ in Policy 1.1 of the PNCCDP meant.¹¹³ Mr Pollock’s response, based on Mr Henry’s evidence, was that the MOU between TMI and MRP does provide active protection of their interests. We also understand that there is an agreement in principle to move on an MOU with ROTNAR, the iwi authority on the eastern side of the ranges. We note here that the peak on the ridgeline *Marama* has had a turbine zone 55 removed for cultural reasons because it could be affected by road works. We also note that iwi will have input into the selection of planting materials to go into the reserve and that MRP has accepted a proposed condition that allows all consent conditions to be reviewed as necessary on the basis of successful claims as a result of Waitangi Tribunal hearings.¹¹⁴

Finding

[184] As far as we can determine, because we have not seen the MOU between TMI and MRP, nor the agreement with ROTNAR, we consider that MRP’s proposal is not inconsistent with the Section 3 provisions of the PNCCDP. This is based on the assurances of Mr Pollock. Ms Forbes’ s42A Report identified issues she was concerned about but, without evidence from TMI itself, we have no cause to revisit some of the issues she raises. As we have noted in Chapter 17, in having regard to the kaitiakitanga of the Huatua Marae, specific adverse effects of the wind farm proposal on the marae have been taken into account in the Board’s overall deliberation. These concern practical issues such as noise, amenity traffic and so on – all of which were central issues to this case – and all of which have particular relevance to the foothills communities in which Huatau Marae is located.

Section 9.3: Rural Zone

[185] The PNCCDP was made operative in December 2000. There is one plan change (#42) which deals with earthworks provisions.

[186] The site falls within the Palmerston North City boundary zoned ‘Rural’ and therefore the related objectives and policies under this heading are the most relevant to assessing the proposal. While there are other objectives referenced in relation to Section 2, which are City View objectives, in Mr Pollock’s opinion these are (by necessity) so generic (as they cover a range of resource management issues across the city) that they are unhelpful in assessing the

¹¹³ Forbes, s42A Report *Cultural Matters*.

¹¹⁴ Pollock, SE para 15; NOE 3830.

proposal. Mr Pollock's assessment nevertheless is that the proposal is consistent with these objectives.

[187] Under the broad framework of the City View objectives, the following more specific objective and policies were identified by Mr Pollock under Section 9.3 for the Rural Zone.

Objective 2 seeks to:

To encourage the effective and efficient use and development of the natural and physical resources of the rural area.

Policy 2.2

To ensure that the adverse effects of activities in the rural area are avoided, remedied or mitigated such that the amenities of the area and nearby urban areas are maintained.

Policy 2.3

To control the actual or potential environmentally adverse effects of activities in the rural area, including the adverse effects of: odour; noise; traffic; visual impact.

[188] The effect of the objective and policies is to describe the type of rural environment, that in part, the plan seeks for Palmerston North City. Mr Pollock observes the objective notes that the rural environment is focused on the use and development of natural and physical resources, which in his opinion reinforces the nature of the rural zone as a 'working' area, with active farms, forestry and wind farms all coexisting. The policies then also refer to the potential for adverse effects arising from activities in the rural area, and in particular that those activities may affect nearby urban areas.

[189] Policy 2.2 is the qualifier to the efficient use and development of the natural and physical resources of the area namely, so that the adverse effects of those activities in the rural area nearby urban areas are maintained. Mr Pollock identifies the two key amenity issues arising out of this policy are those identified in Policy 2.3 namely noise and visual amenity effects. He considers, in terms of the two policies, that there will be no adverse effects on Palmerston North (ie, urban areas) that will be more than minor, and these will be limited to visual effects, which a number of submitters consider to be positive in any case. In respect of adverse effects on the 'rural area' these will be limited to potential noise and visual effects, which for the reasons he had discussed earlier are not considered to be significant, other than in relation to visual effects for some close-up rural residential properties.

[190] We note in Policy 2.2 that it is the 'amenities of the area' not just the nearby urban areas which are to be maintained. There are numerous rural residential dwellings in proximity to the proposed wind farm – we are unclear precisely as to how many rural residential developments are now located within the 3 kilometre zone. But in caucusing it is recorded that Messrs Pollock and Baker agreed that the correct numbers of dwellings to be considered as part of the existing environment for the Palmerston North territorial area within

3 kilometres of the nearest turbines are those shown on Attachment 3 to that statement – namely:

- 274 existing dwellings;
- 95 dwellings that could be constructed as a permitted activity on existing vacant lots;
- 84 recently subdivided sites where dwellings could be constructed as a permitted activity.¹¹⁵

[191] Mr Baker seeks to include a further 371 lots based on future potential subdivision at Pacific Drive. This includes resource consents for discretionary activities that have not yet been granted in the Residential Zone.¹¹⁶ This figure was challenged by MRP through Mr Pollock and MRP’s counsel, who called in aid *Queenstown Lakes District Council v Hawthorn Estate Limited*,¹¹⁷ a decision of the Court of Appeal which states:

In our view, the word “environment” embraces the future state of the environment as it might be modified by the utilisation of rights to carry out permitted activity [sic] under a district plan. It also includes the environment as it might be modified by the implementation of resource consents which have been granted at the time a particular application is considered, where it appears likely that those resource consents will be implemented. We think Fogarty J erred when he suggested that the effects of resource consents that might in future be made should be brought to account in considering the likely future state of the environment. We think the legitimate considerations should be limited to those that we have just expressed.¹¹⁸

[192] Mr Pollock advised that discretionary consents that have not been lodged or granted should not form part of the existing environment for the purposes of s104. We agree. Our interpretation of *Hawthorn* is that, while permitted activities are part of the existing environment, discretionary activities are not, because they may not be implemented for reasons outlined in the plan. This may seem unfair to the relevant developers, Pacific Farms Ltd and Palmerston North Industrial and Residential Developments Ltd,¹¹⁹ but it is the law as stated at the point in the time the application was lodged. From our assessment of the Concept Plan 1, an attachment to the *Beca Planning Expert Report* cited above, two lots out of 174, within a 3 kilometre area only, had been consented to under RM 2553. From our assessment of Concept Plan 2, 72 lots have been consented under RM 2851 and that adds up to 80 consented lots and a further 78 residential lots under RM 2636 for the same area of land, which does not seem to equate with the figures given above.

¹¹⁵ But see Ms Blomfield’s Closing Submission for HRC, citing Williams’ s42A Report, p23.

¹¹⁶ *Beca, Planning Expert Report*, 18 June 2009, pp6–8.

¹¹⁷ [2006] NZRMA 424, para 84.

¹¹⁸ Pollock, EIC paras 41–44. Price, MRP Closing Submission, paras 3.4–3.5.

¹¹⁹ See Concept Plan # 1 and Concept Plan # 2 attached to the *Beca Planning Expert Report*, pp6–7. We require clarification here.

[193] In making this assessment, in terms of the overall scheme of the plan, we also note Mr Pollock's opinion that the wind farm is not inconsistent with those objectives and policies cited above referring to *Doherty v Dunedin City Council* where it was accepted that:

... in providing for the activity as a discretionary activity in the zone it cannot, by definition, be contrary to the objectives and policies of the Plan. As a discretionary activity it is accepted as being generally appropriate within the zone but not on every site.¹²⁰

[194] Mr Pollock observes that the Rural Zone in Palmerston North does not provide for a higher level of amenity for those people moving into the rural environment.¹²¹

[195] We accept Mr Pollock's proposition, noting, however, that the draft Scottish Planning Policy on the siting of wind farms and the degree of suggested set back from the edges of cities, towns, villages (up to 2 kilometres), makes the point that while wind farms are suitable in many areas they may not be on some individual locations because of local circumstances and geography – both issues which are considerably relevant here.¹²² We observe here also that the plan provisions do not outweigh the evidential strength that may arise under s7(c) RMA which informs s5.

[196] As to noise, we are satisfied after the redesign and the further evidence and caucusing of the experts, together with the directions given in NZ6808:2010, that the aural amenity of the rural residential and urban dwellers can be maintained. The now very strict noise conditions, with the additions we have requested as set out in Chapter 14, have resulted in the BPO being applied in a way that was not possible several years ago when *Project West Wind* was heard. And if by chance SAC do emerge the remedies to de-rate may be applied in a much swifter manner than was possible on that project.

[197] As to traffic, in Chapter 14, we have given particular consideration to the effects of construction traffic on the users of Kahuterawa and Greens Roads. MRP has proposed a range of conditions and a traffic management plan for controlling these effects.

[198] In our Draft Report, we concluded that, as drafted at that time, these did not go far enough to protect the safety and amenity of the road users. We therefore requested MRP to agree with PNCC on a revised set of conditions and traffic management plan which addressed the concerns we had identified in Chapter 14 of our Draft Report. Following a further iteration with MRP, we have now approved a set of conditions for construction traffic using Kahuterawa and Greens Roads.

[199] Finally, there is the question of the visual amenity of the rural residential dwellers which we consider should also be controlled further. Mr Baker, who was

¹²⁰ Pollock, EIC paras 318–320, citing Environment Court Decision C6/2004, p11.

¹²¹ Ibid, NOE 3808.

¹²² Price, MRP Closing Submission, paras 3.25–3.31.

on the whole supportive of *Turitea* meeting the intent of the overarching City Wide objectives and policies and its significant benefits, was also clear the wind farm would not meet the intent of Policies 2.2 and 2.3. He considered a truncated proposal, such as he suggests after the redesign, would be a better fit.¹²³ We make further findings on that issue under Part 2 matters in Chapter 19.

[200] The redesign turbine deletions and relocations brought considerable relief from ‘the most dominant’ or ‘most overly dominant’ effect of the turbines on many rural residential dwellers. But we do not consider the deletions go far enough. The Bryant Hill (West) Group A turbines and WT95 of the C Group should be deleted if residential amenity for the foothill communities is otherwise to be maintained. The K Group series, while located at well-dispersed intervals, down a 5 kilometre length of road with some mitigation from other small hills, ridges, plantations and vegetation in the foreground, indicate that they are still clearly dominant on their pastoral landscape from some rural residential and urban areas, and they break the protected skyline and impact on the views of the Turitea Reserve.

[201] In terms of the amenity of urban areas too, we consider that if the turbines were to remain on the skyline ridge, the existing visual amenity that *Turitea* provides to the citizens of Palmerston North and those associated ‘urban’ areas of the Manawatu Plains would not be consistently maintained.

[202] Meanwhile the Group G turbines would not maintain the outward views from Red Rock Knob. Nor are we convinced that the transmission towers close to residents will maintain the amenity of the rural residential dwellers either despite Mr Anstey’s assurance otherwise.

Finding on Objective 2

[203] We find, even after the redesign, *Turitea* is inconsistent with parts of Policies 2.2 and 2.3.

[204] We provide further comment on the amenity effects of the transmission towers in our finding under Section 23 Network Utilities.

Objective 3

To enhance the quality and natural character of the natural environment.

Policies

- 3.1 To provide for the health and safety of rural dwellers by establishing specific noise limits for the rural area.
- 3.2 To encourage the adoption of sustainable land use practices.
- 3.3 To control the adverse visual effects on the rural environment (including effects on rural dwellers) of activities that disturb the land surface, introduce buildings, remove and/or process natural materials.

¹²³ Baker, OS (2010) paras 23–24.

3.4 To encourage the protection of the in-stream values of spawning rivers and streams.

[205] Mr Pollock based his assessment of these plan provisions on the advice of Mr Hegley on noise, and also on Mr Wyatt's evidence that the majority of earthworks activity will be in 'cut';¹²⁴ thus the potential for adverse effects arising from land disturbance has been significantly reduced, may be otherwise controlled and are therefore acceptable. As to the visual effects from buildings (in the form of substations), given the location of the substations, the effects will be very low.

[206] We do not consider that some aspects of the proposal, as set out in the objective, enhance the quality and natural character of the rural environment. These aspects revolve around the intrusion of the turbines into the skyline, into an ONL and ONF, and into areas of 'moderate', 'high' and 'very high' ecological significance. We consider enhancement of the road verges down to 6 metres through rehabilitation after the turbines have been constructed is inefficient, if they have to sustain heavy cranes throughout the life of the project. But if they are to remain at 10 metres and be revegetated, and be revegetated again if brought back to 6 metres at the end of the life of the consent, then only will they enhance the quality and natural character of the environment. But the concrete platforms, which will remain scattered throughout the reserve, will leave irremediable footprints in terms of potential successful rehabilitation of the indigenous vegetation. And while we commend the idea of an eco-park as an environmental offset it appeared to have no traction from PNCC at the hearing and may have even less given our consideration as to the need for further deletion of wind turbines. We consider its further promotion is in the hands of both the PNCC and MRP and is outside what we consider here.

[207] We endorse nevertheless the restoration of the wetlands in Browns Flat, while we consider restoration of two lengths of old road through the water catchment area – to offset the provision of two new alignments through an area of high and very high ecological value – will provide some mitigation of the adverse effects of that part of the proposal.¹²⁵ We also commend MRP for its concern to protect the avian communities associated with the reserve and the continued monitoring that will provide ongoing information on this issue.

[208] As to Policy 3.1, the district plan makes no specific provision for the protection of the health and safety of rural dwellers through noise limits except through its general noise rules for the rural area (Rule 9.12.1). For wind farm noise, however, the plan defers to NZS6808:2010, the relevant provisions of which now inform the caucused noise conditions and NMP.

[209] As to other aspects of natural character involved in the proposal, ie, the pastoral lands and the pine plantations around the site, the construction of the turbines do not affect any of the pine plantations, except in some minor incursions on Back Ridge near the Pahiatua Track.

¹²⁴ See Wyatt, EIC para 13.1.

¹²⁵ See Chapter 8.

[210] As to Policy 3.4, we commend MRP for the considerable care to be taken around protection of the water catchment areas and the steps to be taken about avoiding sedimentation. This will also impact positively on the fisheries values identified by Drs Coffey and Joy.

Finding on Objective 3

[211] In this regard, we find the proposal has features which are both consistent and inconsistent in the plan provisions.

Objective 4:

To recognise and enhance the diversity of the rural community.

Policy 4.1:

To permit a variety of land-based activities subject to control of their adverse environmental effects

Policy 4.3

To allow a range of other activities where their adverse effects can be avoided or mitigated.

are seen by Mr Pollock as most relevant to the proposal.

[212] He assesses this objective and policies together concluding that:

- (a) establishing a wind farm on the site will enable the harnessing of a natural resource (wind) while at the same time enable the continuation of farming practices on the land, which is not land of high productive capacity;
- (b) this potential 'dual' use of the property (for land-based farming and wind farming) represents an efficient use of resource(s); and
- (c) there is no evidence that any part of the property is subject to natural hazards.

[213] For this witness, MRP's proposal highlights the diversity of rural communities surrounding the *Turitea* site. Mr Pollock observes that a range of other activities (other than land based) may be permitted in the area (in this case wind farms as a discretionary activity). Here, 30 landowners support the proposal, while TAG and FOTR members oppose it – reflecting the diverse interests of this location. Provided adverse effects of this other activity can be avoided or mitigated then the proposal may be considered consistent with Policy 4.3.

Finding on Objective 4

[214] Only around the issues of protection of the ecosystem/biodiversity of the Turitea Reserve as an ONF do we consider the project provides inconsistency with Policy 4.3. For this reason above we determined that some of G series turbines should be relocated. And where we consider two road alignments should

be provided, to give access to the remaining G, H and F turbines, we consider its intrusion into the vegetated areas of national importance should be mitigated by restoration of the redundant sections of the current road. The protection of an ONF (the skyline) and the ONL on the Turitea Reserve is also required if the proposal is not to provide inconsistencies around either feature also. In that MRP redesigned part of the project to avoid adverse visual amenity effects on the residents, we conclude that Policy 4.3 is partly met, but other turbines require removal to be fully consistent with Policies 4.1 and 4.3. This is because their impact is such that they cannot be mitigated and need to be avoided altogether.

Rule 9.9.2

[215] Mr Pollock also suggests that the wind farm activity should also be considered in the light of the discretionary activity (Rule 9.9.2) assessment criteria as follows:

- (a) To avoid, remedy or mitigate adverse visual impacts of any proposed building, structure or storage areas for products and waste, on the surrounding rural environment, and on the landscape values of adjoining areas.
- (b) To avoid, remedy or mitigate the effects of noise and other environmental disturbance, on the amenity of the surrounding area.
- (c) To avoid, remedy or mitigate the risk of contamination posed by hazardous substances.
- (d) To avoid, remedy or mitigate the adverse effects on the safe and efficient operation of the roading network from the traffic movements generated by activities.
- (e) To ensure the provision of adequate on-site parking loading, manoeuvring and access space to avoid this taking place on the roads.

[216] Mr Pollock comments in some detail on these criteria. Policy 9.9.2(a) relates to adverse visual effects of any structure – in this instance, wind turbines, transmission towers and substations. Mr Pollock relies on Mr Wyatt's assessment that the adverse visual effects of these components of the Turitea wind farm are initially significant, in particular, from residential view points, but that with appropriate mitigation, they become acceptable.

[217] We do not accept that mitigation through implementing vegetation and identifying public perception studies is appropriate for what are dominant adverse amenity effects on the rural residential communities.

[218] Policy 9.9.2(b) relates to noise and Mr Pollock endorses the recommended mitigation and noise management measures that are to be implemented. In our view, subject to the final conditions of consent, the proposal will meet the noise requirements of the plan, and of NZS6808:2010. Policy 9.9.2(c) has been addressed through the inclusion of appropriate bunding around each potential source of hazardous substance, while site management practices

will be governed by the CEMP and SEMP, which will include industry standard requirements on handling of on-site fuel.

[219] We accept that the proposal as managed through the CEMP and SEMP is appropriate in this sensitive environment.

[220] Policy 9.9.2(d) has been addressed in some detail by the roading experts as set out in Chapter 14. Their conclusion is that, with the exception of Kahuterawa and Greens Roads, any adverse effect on the road network or other road users will be minor, and that long term the improvements to the road network at the Pahiatua–Aokautere Road and South Range Road intersection will result in improvements to road user safety. Furthermore, Mr Pollock’s assessment is that there will be sufficient parking space provided on-site, and therefore the proposal is also considered to be consistent with Policy 9.9.2(e).

[221] For Kahuterawa and Greens Roads, the final conditions of consent specify controls for these roads strict traffic management. These arrangements, once implemented, will be consistent with those policies.

[222] Otherwise, we have concluded in the preceding chapters that most of the potential effects from construction engineering, soil disposal, road workers, noise, health and safety and so on can be avoided by MRP and, if not avoided altogether adequately, mitigated.

Finding on Rule 9.9.2

[223] Apart from our reservations around Policy 9.9.2(a) we consider the very extensive conditions proposed on the resource consents, the management plans, the monitoring regimes to be set up around any discharge to water and the effects of noise, are consistent with the efficient management of the issues identified, and therefore consistent with the plan provisions. As noted, nevertheless, the safe and efficient operation of the roading network requires further work on conditions around Kahuterawa and Greens Roads to be fully consistent with Rule 9.9.2(d).

Section 23: Network Utilities

[224] Finally, the PNCCDP includes objectives and policies relating to Network Utilities. These are important in considering the internal and external transmission lines which connect the site to the national grid at Linton. The utilities objectives are as follows:

Objective 1

To enable the establishment and maintenance of network utilities in the interests of community well-being, health and safety.

Objective 3

To ensure network utilities are constructed and located in a manner sensitive to amenity and landscape values in both urban and rural environment.

[225] In commenting on the transmission line components of the project, Mr Pollock refers to the evidence of Mr Wyatt, noting his assessment is that there is a potentially significant adverse effect arising from the 220kV transmission lines from the Browns Flat substation to the Linton substation. While written approvals have been provided for the properties across which these lines traverse, other nearby residential properties are affected.

Finding on Section 23: Network Utilities

[226] Mr Wyatt concludes that the scale of these potential adverse effects can be appropriately mitigated by landscape screening. Unlike Mr Wyatt or Mr Pollock, we consider this will be difficult because of the height and size of the monopole towers, which are up to 45 metres high. To that extent, given the proximity of so many residences to the transmission towers, we find the proposal is inconsistent with Objective 3. This finding, however, is offset by Objective 1 where the network utilities are seen to contribute to the interests of community wellbeing, health and safety. We recognise here community wellbeing and aspects of health and safety would be achieved through additional access to the benefits of renewable energy.

Plan Change 42 – Earthworks

[227] Mr Pollock identifies Plan Change 42 introduces new objectives, policies and methods in relation to earthworks activities in the city. The main objective is as follows:

To provide for earthworks activities where the associated adverse effects are able to be avoided, remedied, or mitigated.

[228] We accept Mr Pollock's opinion that, given that the expert assessment of Messrs James and Levy, and Dr Coffey (and, we note, Dr Blaschke), the adverse effects associated with earthworks can be avoided or mitigated and consider the proposal is consistent with this objective.

Finding

[229] Our overall assessment is that the proposal is consistent with many of the objectives and policies of the PNCCDP, and the Rural Zone provisions in particular. Where it is inconsistent, the proposal, despite the redesign, does not fully control its adverse visual effects on the amenities of the foothills and the nearby urban area and the ONF and ONL landscape and features in the reserve.

Note

[230] We note the PNCC has not furthered the RPS Methods to Implement Policies 22.3.1. Method 8.2 – where district councils should provide for the protection of ONF and ONL in district plans.

Tararua District Plan

[231] Mr Pollock identifies that part of the site which falls within the Tararua District is zoned as 'Rural Management Area'. This area includes the objectives and policies he considers are the most relevant to assessment of the Turitea wind farm.

Objective 2.3.2.1

To achieve sustainable rural land use and efficient use of resources.

Objective 2.3.3.1

To maintain the vitality and character of the District's rural areas.

[232] Mr Pollock observes these objectives recognise the nature of the rural environment as having vitality and character, and also recognise they are used for a range of productive and lifestyle activities. Objective 2.3.2.1 relates to use of land for productive activities and protecting important environmental qualities of the rural area. He notes that traditional productive rural farms and wind farms are highly compatible and there will be no loss of productive potential of the land as a result of the wind farm. Furthermore, the project will increase the efficient use of natural and physical resources as the land will become more productive by carrying out normal farming operations and productive use of the wind resource. In this regard, Policy 2.3.3 2(b) is particularly relevant in Mr Pollock's view. It reads as follows:

To provide, in rural areas, for activities which require a rural location or which specifically serve or support the rural community, where their effects are compatible with the surrounding rural area and the environmental results sought for Rural Management Areas.

[233] In this regard, Mr Pollock identifies matters of particular relevance:

- wind farms do not interfere with the normal operation of productive rural activities such as pastoral farming;
- the harnessing of wind energy in this location represents a further efficient use of rural land;
- wind farms require a rural location and one that allows a proposal which has a need for large areas of land within which to generally contain potential adverse effects;
- the rural environment is sparsely populated and hence the sensitivity of the environment is less than an equivalent urban area.

Discussion

[234] The Percy and McBride families will be adversely affected to the extent that the project may be unacceptable from the Tararua viewpoints unless some useful mitigation for these residents can be found. Other than these reservations, we consider that *Turitea* is generally compatible with the surrounding rural area of

the Tararua District, and this is reflected in the fact that so many rural landowners in the overall area of the site have given their approval to the proposal and only two rural residential Tararua landowners have filed an objection. This area of the Tararuas does not contain foothills communities. Thus, the wind farm is generally consistent with the relevant rural provisions of the TDP as we were advised of them.¹²⁶

Objective 2.9.6.1 relates to water quality, as follows:

To avoid the degradation of surface water and groundwater quality in the District.

[235] Mr Pollock identifies the potential degradation of surface and groundwater quality could arise from uncontained sediment-laden runoff entering waterways within the site. The evidence of the MRP and, more latterly, the PNCC witnesses consider this is unlikely to occur, and any discharges will be acceptable. Further, any sediment discharges that do occur are also likely to be short term in nature. The CEMP, which will govern activities on the site, will impose industry standard runoff and sediment controls identified by the parties. The draft consent conditions also will reinforce the CEMP provisions.

Finding

[236] With regard to Objective 2.9.6.1, we accept Mr Pollock's evidence that the proposal is consistent with this objective for all the reasons he gives.

[237] Other relevant objectives and policies from this plan are as follows:

Objective 2.3.4.1:

To ensure a high level of environmental quality and amenity throughout the rural areas of the District.

Objective 2.6.4.1:

To protect important natural features (including areas of indigenous vegetation and habitats of indigenous fauna) and landscapes in the District which are of local, regional or national significance.

Policy 2.6.4.2(c):

To encourage the protection of significant natural features, landscapes and habitats from inappropriate subdivision, development or use, and to promote public access where this will not adversely affect conservation or private property values.

[238] The TDC Plan (operative and proposed) does not identify the skyline as an ONF; rather, Objective 2.6.4.1 and Policy 2.4.6.2(c) identify 'important natural features' and 'significant natural features' respectively.¹²⁷

¹²⁶ As a result of submitters' comments on the Draft Report, this opinion has partially changed. See above Chapter 13.

¹²⁷ Pollock, SE para 20.

[239] As Mr Wyatt points out, like the PNCCDP the TDC Plan relies heavily on the guidance provided in the RPS in terms of identifying natural landscapes and features requiring protection, but it contains some more detailed provisions in this regard.

[240] It recognises that the protection of outstanding natural features is a significant resource management issue for the district (clauses 2.3.1.3 and 2.6.1). Clause 2.6.1.3 also refers back to Policies 8.1–8.3 of the RPS, noting that both the ridgeline of the Tararua Ranges and the Tararua Forest Park are identified as regionally significant features and landscapes in that document.

[241] In respect of these issues, Objective 2.6.4.1 of the TDC Plan is to ‘protect important natural features (including areas of indigenous vegetation and habitats of indigenous fauna) and landscapes in the district which are of local, regional or national significance’. This is specifically supported by Policy 2.6.4.2, which provides criteria (adapted from the RPS) for identifying and classifying particular natural features and landscapes that contribute in a significant way to the amenity and environmental quality of the district.

[242] Mr Pollock identifies Appendix 3, Section 3.3 of the TDC Plan includes a schedule of 10 natural features and landscapes that are considered to be significant, based on Policy 8.3 of the RPS. As with that policy, Appendix 3 therefore includes both the Tararua Forest Park (for its recreational and ecological values, particularly the rare tussock lands) and the ridgeline of the Tararua Ranges (for its scenic values, particularly as viewed from adjacent plains). Any proposal that might cause modification to, or damage or destruction of, these features, is classified as a discretionary activity.

Proposed Tararua District Plan

[243] Mr Pollock also identifies the relevant provisions of the proposed TDP are identical in substance and numbering to those from the Tararua Plan identified above and therefore are not addressed separately.

[244] In spite of the above, in the text of the Draft Report, MRP comments that we omitted the Proposed Tararua District Plan from our consideration.¹²⁸ We include it here, as set out by Mr Pollock – the only evidence that was produced.

The operative and proposed TDC District Plans are essentially identical documents. The relevant provisions that I have referred to have not been amended. However, it should be noted that in relation to the proposed Plan, there are a number of submissions that relate specifically to wind farms and wind farm development. Therefore, the proposed Plan should not, in my assessment, carry any weight in relation to the “rolled over” objectives and policies.

¹²⁸ MRP, Comments on the Draft Report, Section One, General, p1.

Finding

[245] We conclude that the Tararua side of Back Ridge presents primarily (at the very least) as a significant amenity landscape.¹²⁹ With the ONF of the skyline clearly discernable above south of Back Ridge, where the turbines are seen in the context of Hardings Park Ridge, this presents as part of the Tararua Forest Park ONL continuum and also as the skyline ONF. In these respects, our findings indicate that there are aspects of MRP's proposal which are inconsistent with these TDC plan provisions.

The Proposed One Plan

Background

[246] HDC has proposed a combined RPS and regional planning framework within one statutory document; hence its title is the 'One Plan'. It was notified for public submissions on 3 May 2007, from which a large number of submissions were received. From the outset, Mr Pollock notes that this is a complex document, in particular, in relation to the interrelationship between rules in the plan and also how the RPS elements link with the regional plan elements.

[247] The witness provided an extensive analysis of the provisions of the POP. He finds MRP's application meets the spirit and intent of all of them. HRC, through counsel, made it clear that Horizons is neither the respondent, nor the primary decision maker – as it would have been in the usual way had the proposal not been called in by the Minister for the Environment. Therefore, through Mr Hindrup, HRC assisted the inquiry by identifying the relevant objectives and policies related to the application, but did not provide an assessment of whether it is consistent with the regional planning documents. Mr Hindrup noted each other regional plan (identified above) is operative and beyond appeal except for the POP, which at the time of the inquiry, contained a number of chapters on which submissions were yet to be heard, and no decisions had been finalised on the others. He states of particular relevance to the inquiry are Infrastructure, Energy and Waste (Chapter 3) and Living Heritage Provisions (Chapter 7).¹³⁰ But at the time of the hearing, in Mr Hindrup's view (and Mr Pollock's), little weight should be given to the POP.

[248] Mr Hindrup did identify one of the consent applications (104553) which is to undertake vegetation removal and land disturbance within a 'rare and threatened habitat', but it is actually to undertake vegetation removal and land disturbance in an 'at-risk habitat' as defined in Schedule E of the POP. None of the vegetation to be cleared at *Turitea* is listed 'at risk' in Schedule E, but because

¹²⁹ See Mr Brown's initial evaluation of the effects of the wind farm on the Tararua western side of the range – see Brown, Exhibit 9, *Turitea Wind Farm Preliminary Assessment of Landscape and Amenity Effects*, Viewpoint 3, p26.

¹³⁰ Hindrup, EIC paras 44–47.

of the presence of the New Zealand Falcon in the bird counts of the Turitea Reserve it is considered as ‘at risk’.¹³¹

[249] The following descriptions are taken seriatim from Mr Pollock’s evidence. His main purpose in reviewing objectives and policies from the POP was to provide the inquiry with an indication of future policy direction at the regional level and to which we are required to give regard to.

Chapter 3: Infrastructure, Energy and Waste

[250] The relevant objective signals that the POP will continue to ‘promote’ renewable energy. While Mr Pollock recognises the specific wording of the objective is modified from the operative RPS, and now specifically refers to renewable energy, in his assessment the intent of the POP remains similar as the initial provision.

Objective 3.1

Resource use activities associated with the provision, maintenance and upgrading of infrastructure, and/or with the use of renewable energy, will be recognised and enabled.

[251] Policy 3-1 provides guidance in relation to the matters relating to infrastructure (the definition of which provides for wind farms) which are to be considered in decision making:

- (a) All persons exercising functions and powers under the RMA shall recognise the following infrastructure within the Region as being physical resources of regional and national importance:
 - (i) facilities for the generation of electricity where the electricity generated is supplied to the electricity grid and facilities and infrastructure to transmit the electricity generated into the electricity grid ...
- (b) In making decisions about the establishment, maintenance, alteration, upgrading, and expansion of infrastructure within the Region, including the infrastructure of regional and national importance listed in subsection (a), the benefits derived from the infrastructure at a local, regional and national level shall be taken into account.

[252] Policy 3-2 states that:

Adverse effects from other activities on infrastructure shall be avoided by using the following mechanisms ...(b) ensuring that any new activities that will adversely affect the efficiency or effectiveness of infrastructure are not located near existing infrastructure, and that there is no change to existing activities that increases their incompatibility with existing infrastructure.

¹³¹ Hindrup, EIC paras 22–23.

[253] Policy 3-2 is also relevant in Mr Pollock's opinion largely because it fills a policy 'void' that exists in both PNCC and TDC district plans at present – that is, the intent to protect significant infrastructure from the effects of other activities. He considers that given the level of investment occurring in the region in relation to wind farms and other significant infrastructure, once established, these facilities should have some protection from the effects of reverse sensitivity.

[254] Policy 3-3 seeks to provide guidance on the adverse effects of infrastructure to be avoided, and how other effects will be dealt with, including the benefits of infrastructure (which mentions the benefits to be derived from the use and development of renewable energy), as follows:

When making decisions on consent applications regarding infrastructure, the adverse effects of infrastructure on the environment shall be managed in the following manner:

- (a) **Effects to be avoided** – The following adverse effects of infrastructure shall be avoided to the same extent required of other types of activities:
 - (i) effects on waahi tapu, waahi tupuna and other sites of significance to Māori
 - (ii) effects on specified waterways valued for natural state and sites of significance (aquatic)
 - (iii) effects on rare and threatened habitats as defined in Chapter 7
 - (iv) effects on the outstanding natural features and landscapes identified in Chapter 7

unless functional constraints make this impossible, in which case adverse effects should be mitigated. Mitigation may include the use of financial contributions in accordance with the policies in Chapter 18.

- (b) **Other effects** – All other adverse effects of infrastructure will be managed in a manner that tolerates minor adverse local effects and takes into account:
 - (i) the benefits of infrastructure, particularly the benefits of regionally or nationally important infrastructure
 - (ii) the integration of the infrastructure with land use
 - (iii) the benefits to be derived from the use and development of renewable energy.

[255] In addition, a financial contribution may be sought in order to provide the option of offsetting or compensating for adverse effects, rather than requiring adverse effects to be avoided, remedied or mitigated. Mr Pollock considers this is an acceptable approach, but in this case he does not consider a financial contribution to be necessary, as the evidence from MRP is that adverse effects have already been appropriately avoided, remedied or mitigated.

[256] Policy 3-4 provides direction on how the region will respond to different proposals for energy generation, favouring renewable generation over non-renewable. This indicates that the future direction of the regional council is to more strongly support renewable generation:

The development of renewable energy generation and use of renewable energy resources shall be preferred to the development and use of non-renewable energy resources in policy development and resource consent decision making.

Chapter 5: Land

[257] While the objectives and policies in the POP appear to be relatively similar in intent to the operative RPS, Mr Pollock identifies objectives relating to land and indigenous biodiversity management introduce concepts such as highly erodible land and rare or threatened habitat.

Objective 5-1

Land is used in a manner that ensures:

...

- (b) sediment loads entering waterways as a result of accelerated erosion are reduced to the extent required to be consistent with the water management objectives and policies set out in Chapter 6 of this Plan and the targets established in Schedule D for those water management zones with elevated sediment levels
- (c) accelerated erosion caused by vegetation clearance and land disturbance is minimised
- (d) the damage to roads and other infrastructure caused by landslides and sediment run-off from hill country is minimised

[258] Policy 5-3 relates to the regulation of vegetation clearance and land disturbance on areas identified as Highly Erodible Land as follows:

- (a) Vegetation clearance and land disturbance, including excavation, filling, tracking and soil cultivation, shall generally not be allowed on Highly Erodible Land unless:
 - (iii) the activity is for the purpose of establishing or maintaining a fenceline or other infrastructure and there is no reasonable alternative location, or ...
 - (vi) other exceptional circumstances apply.
- (b) Any vegetation clearance or land disturbance that is allowed on Highly Erodible Land shall not significantly increase the risk of erosion or land instability.

[259] Based on Mr Levy's evidence, Mr Pollock concludes that neither the vegetation clearance nor earthworks proposed will significantly increase the risk of erosion or land stability once the specific erosion and sediment control measures have been put in place.

Chapter 7: Living Heritage

[260] Mr Pollock identifies the POP provides new regional policy direction in relation to vegetation clearance. Issue 7-1 relates to indigenous biological and landscape and natural character diversity where it is stated:

Indigenous biological diversity is not being maintained in the Manawatu-Wanganui Region. Only a small proportion of the original extent of indigenous habitats remains as a result of historical land development practices. The diversity within remaining areas is declining owing to their isolation and/or as a consequence of a range of activities, most notably:

- (a) pest plants and animals
- (b) stock access
- (c) land drainage, which impacts upon wetlands
- (d) perched culverts and other barriers to fish migration
- (e) run-off and discharges causing poor water quality
- (f) vegetation clearance

Landscapes and natural character

- (a) The Region's landscapes are at risk from the effects of development, particularly the Tararua and Ruahine ranges. Developments with the potential for greatest impact include wind farms, residential subdivision and other major structures.
- (b) The natural character of the coastal environment, wetlands, rivers, lakes and their margins is at risk from the effects of land-use activities and development, particularly new river works, drainage and subdivision in areas with a high degree of naturalness.

[261] Mr Pollock observes that neither district plan contains provisions which manage indigenous vegetation clearance.

Objective 7-1 states:

The existing level of indigenous biological diversity is maintained into the future by ensuring that:

- (a) rare and threatened habitats, as defined in Schedule E, are protected from activities that may cause any loss or modification to the representativeness, distinctiveness or ecological context of these areas.
- (b) at-risk habitats, as defined in Schedule E, are maintained by ensuring that activities do not cause any significant adverse effects on their representativeness, distinctiveness or ecological context.
- (c) the best representative examples of rare and threatened habitats and at risk habitats are proactively managed in order to improve their function.

[262] Mr Pollock identifies Mr Shaw's evidence is that the vegetation affected by the wind farm does not include that contained in Table E.1 of Schedule E (that

is, it is not a rare or threatened habitat), but Table E.2(a) and E.3 are relevant, which firstly relate to the water management sub-zone and secondly to the life-supporting habitat of a threatened species (which relates to the New Zealand falcon). Mr Pollock observes the relevant hearing report recommends deleting the reference to New Zealand Falcon from this table.¹³²

[263] The final POP provisions which need to be evaluated are those relating to landscape. Mr Pollock identifies the first point to note is that the ‘outstanding’ landscapes listed in the operative RPS have been included in the POP, although new objectives and policies are provided.

[264] Objective 7-2 is as follows:

- (a) The characteristics and values of the outstanding landscapes identified in Schedule F are protected as far as practicable.
- (b) Adverse effects, including cumulative adverse effects, on the natural character of the coastal environment, wetlands, and rivers, lakes and their margins are:
 - (i) avoided in areas with a high degree of naturalness
 - (ii) avoided, remedied or mitigated in other areas.

[265] Schedule F identifies the ‘Skyline of the Tararua Ranges’ as being an outstanding landscape (as opposed to ‘feature’ in the RPS) within the region.

Policy 7-7(c) further provides that:

The landscapes listed in Schedule F shall be recognised as outstanding. All subdivision, use and development affecting these areas shall be managed in a manner which:

- (a) avoids or minimises to the extent reasonable any adverse effects on the characteristics and values specified in Schedule F for each landscape
- (b) takes into account and avoids any cumulative adverse effects
- (c) takes into account the policies in Chapter 3 when assessing activities involving renewable energy and infrastructure of regional importance.

[266] Given the similarity with the operative RPS provisions regarding visual and landscape amenity, Mr Pollock identifies his assessment on that earlier document is seen to also apply here.¹³³

[267] Mr Pollock concludes that the POP seeks to continue the existing RPS’s approach to recognising the importance of renewable energy. It adds further objectives and policies which assist decision makers in assessing such proposals. Overall, it is his opinion that the POP provides support for the *Turitea* wind farm

¹³² We were not advised whether this occurred or not but see our findings under Issues in Chapter 10, Avian Ecology.

¹³³ We note, however, Schedule F of the POP defines the skyline as an outstanding landscape, which differs from the operative RPS.

proposal, but that little weight can be assigned to the objectives and policies, given its early stage of development (at the time of the hearing).

[268] We note all of Mr Pollock's careful observations in relation to the POP. Nevertheless, we give particular regard to what is stated by HRC in relation to landscape and skyline issues.

[269] Mr Hindrup included in part of his evidence the following résumé of the provisions of the proposed plan, which expands a little on what Mr Pollock had to say:

The POP list of regionally outstanding landscapes (as notified) differs slightly from the list in the operative RPS. The list is shorter, and although it includes the skyline of the Tararua Ranges, it does not include a description of the skyline as the RPS does. Instead it includes a map of the landscape which identifies the land within the Department of Conservation Estate as significant. The proposed wind farm site is to the north east of, and is outside the area identified in the relevant map (Figure F:9).

Like the RPS the POP relies on decisions on District Council resource consents and provisions in the District Plans to 'give effect to' the policy in the POP. The POP goes a step further than the RPS and states that HRC will formally submit to resource consent applications and seek changes to District Plans to ensure that the POP is given appropriate recognition.

The POP hearing of the landscape and natural character provisions (Chapter 7 – Living Heritage) was set down for June 2009. I can confirm that the officer's recommendation was to amend Policy 7-7 and Schedule F, which relates to that policy, which identifies the region's outstanding natural features and landscapes. Regarding the skyline of the Tararua Ranges, the officer's recommendation was to include a definition of the skyline of the Tararua Ranges. The recommendation also provides clarification around the mapped areas showing the ranges, and in particular it identifies that the outstanding natural feature or landscape extends beyond the areas which are mapped. If this recommendation is adopted by the Hearing Panel, the site of the proposed wind farm would be an outstanding landscape.¹³⁴

[270] Mr Anstey identified that, in the POP, the skyline of the Tararua Ranges is defined as:

The boundary between the land and sky as viewed from a sufficient distance from the foothills so as to see the contrast between the sky and the solid nature of the land at the crest of the highest points along ridges.

[271] By the time we were drafting this report, the POP had been released as the final One Plan for the region. Because a number of those provisions are in the process of being appealed to the Environment Court, while we have had regard to

¹³⁴ Hindrup, EIC paras 46–47.

the various relevant provisions in that document also, we can give them little weight and make no findings for either the proposed plan or the One Plan.

Finding

[272] It will be clear to all who read this that we do not consider the whole wind farm site is an ONL. It is limited to most of the Turitea Reserve. We are bound to identifying questions of fact provided by the landscape experts – in this case, in particular, Ms Lucas (see Chapter 12), having accepted all the landscape witnesses' evidence that the foothills environment and near the Pahiatua Track on the reserve are substantially modified and are not part of the ONL.

The Board's Response to MRP's Comments and Mr Henry's Statement in Appendix 1 Relating to the Amended Horizons Proposed One Plan, August 2010

[273] The HRC notified its decisions on submissions to the POP on 24 August 2010. Mr Henry considers that, as a result, the POP now provides greater recognition of, and incentive for, the development of renewable energy compared with the wording of the particular provisions of the plan as originally notified. His consideration is based on the fact that:

- the POP now includes separate issue descriptions for energy and infrastructure rather than a combined description in order to ensure consistency with the various government energy strategy documents;¹³⁵
- HRC therefore rejected submissions, seeking that infrastructure and energy provisions should be combined in the POP;
- the POP's revised approach has been to better recognise the importance of renewable energy and the need to increase its use;
- HRC accepts that energy efficiency and energy conservation alone are insufficient to achieve the Government's 90% goal for renewable electricity generation by the year 2025;¹³⁶
- the POP provisions regarding the operation, maintenance and upgrade of infrastructure have been clarified and strengthened to direct consent authorities to allow minor adverse effects from new activities and that any more than minor effects should be avoided, remedied or mitigated (according to certain criteria set out in the plan).¹³⁷

¹³⁵ POP clause 3-1.

¹³⁶ Ibid.

¹³⁷ POP policies 3-3, 3-3A and 3-4.

Discussion and Finding

[274] The Board received a copy of the decisions version of the POP from HRC in August 2010, but with no accompanying commentary from that council on the basis that it remains neutral over MRP's application for *Turitea*. PNCC raises the question as to whether the change in status of any planning instrument after a draft decision by the Board of Inquiry is a relevant one, when reasons for our decision are already given; and asks whether submissions on the decisions version of the POP constitute 'comments' by the parties under the strictures of s148 RMA?¹³⁸

[275] The issue is certainly arguable but we have chosen as noted earlier to infer a wider interpretation of the word 'comment' on 'any aspect of the draft' as well as considering that s88A(2) RMA applies – irrespective. This states:

- (2) Notwithstanding subsection (1), any plan or proposed plan which exists when the application is considered must be had regard to in accordance with section 104(1)(b).

Section 104(1)(b) also applies as follows:

- (1) When considering an application for a resource consent and any submissions received, the consent authority must, subject to Part 2, have regard to –
 - ...
 - (b) any relevant provisions of –
 - ...
 - ...
 - (iii) a regional policy statement or proposed regional policy statement
 - (iv) a plan or proposed plan; and

[276] The Board finds therefore that it is still 'considering' MRP's application. That is not to say we will reopen all our findings. We have considered only genuinely new relevant material since the Draft Report was issued.

[277] PNCC submits the POP's maturation is significant because it represents the product of the community and wind energy developers' debate about the appropriate policy stream to fulfil Part 2 RMA and s7(i) and s7(j), as well as the then proposed NPS on renewable energy. But counsel points out the 'status' of the POP has not yet changed (unlike the NPSREG) and it is a question of what weight we now give it.¹³⁹ We agree with this.

¹³⁸ Maassen, Counsel for PNCC. *Palmerston North City Council's Response to the Board's Memorandum Dated 30 May 2011*, para 23.

¹³⁹ See note 138, para 31.

[278] We, nevertheless, also agree with Mr Henry that the POP now includes separate issue descriptions for energy and infrastructure and that the POP's revised approach better recognises the importance of renewable energy and the need to increase its use.

[279] We also further agree that the POP considers that energy efficiency and conservation alone are insufficient to meet future energy demands (Issue 3-1A).

[280] We recognise too that Policy 3-3(b) allows for minor effects from new infrastructure activities of regional or national importance (such as *Turitea*) rather than the convoluted management of some minor adverse local effects (see original POP Policy 3-3).

[281] Mr Henry states that Policy 3-3(c)(i)–(iv) states that any more than minor effects should be avoided, remedied or mitigated (according to criteria in the plan) and that major adverse effects should be avoided and so on by taking into account those criteria.¹⁴⁰ Policy 3-3(c)(iii)–(iv) raises questions as to whether 'there are any reasonable practical alternatives' and whether 'any more than minor adverse effects can be offset by financial contributions'. Counsel for PNCC also submits that the POP maintains the ONL status of the Tararua skyline and importantly provides an avoidance policy (where practicable) together with a policy specifically directed at the careful management of cumulative effects (see Table F1 and Policy 7-7). Thus a question of weighing both policies in the context of the Turitea Reserve arises once matters of fact have been satisfactorily established in both cases.

[282] We acknowledge overall that the POP should be given more weight than Messrs Pollock or Hindrup properly gave it in the Draft Report because it was then at an early stage in the planning process.¹⁴¹ But even so, the POP is still subject to Part 2 RMA – see s104(1) – and is still not operative. We understand it is subject to appeals. We are also required to have regard to the POP in the context of all the other provisions of s104(1) to which we are also required to have regard – such as adverse and potential effects (s104(1)(a)); the provisions of the PNCCDP (s104(b)(iv)); the relevant provisions of the RPS (s104(1)(b)(iii)); and the NPSREG as set out above. 'Other' relevant matters under s104(1)(c) also come into the equation – such as the Energy Strategy, which in this case supports aspects of the NPSREG.

Finding on POP

[283] Our ultimate conclusion on all of these provisions, with the exception of the NPSREG, was set out in Chapter 19 of our Draft Report discussing Part 2 RMA. The POP does not change our conclusions but does change the weighing previously given in Chapter 18 of the Draft Report¹⁴² to extent that the new provisions even more firmly emphasise the importance of renewable energy. That

¹⁴⁰ Henry, Second Statement, Appendix 1, para 3.12(c).

¹⁴¹ Draft Report, Chapter 18, para 227.

¹⁴² Draft Report, Chapters 18 and 19.

is but one factor among many, which we have extensively already accounted for and reiterate again in our response to comments on the Draft Report.

Section 104(1)(c) Other Relevant Considerations

[284] The following documents are, in Mr Pollock's opinion, relevant 'other matters' that need to be considered under section 104(1)(c).¹⁴³

(a) New Zealand Energy Strategy

[285] In 2007, the Government introduced the *New Zealand Energy Strategy to 2050: Towards a Sustainable Low Emissions Energy System* (October, 2007) (the Energy Strategy). The document recognises two major energy challenges faced by New Zealand, including:

- the need to respond to the risks of climate change by reducing the greenhouse gases caused by the production and use of energy; and
- the need to produce clean, secure, affordable energy while treating the environment responsibly.

[286] Mr Pollock identifies consenting new renewable generation is clearly a fundamental part of the solution in meeting both of these challenges.

[287] The vision as described in the Energy Strategy is:

A reliable and resilient system delivering New Zealand sustainable, low emissions energy services, through:

- providing clear direction on the future of New Zealand's energy system;
- utilising markets and focussed regulation to securely deliver energy services at competitive prices;
- reducing greenhouse gas emissions, including through an emissions trading scheme;
- maximising the contribution of cost-effective energy efficiency and conservation of energy;
- maximising the contribution of cost-effective renewable energy resources while safeguarding our environment;
- promoting early adoption of environmentally sustainable energy technologies; and
- supporting consumers through the transition.

[288] While the Energy Strategy includes a range of measures to achieve this vision, Mr Pollock considers of greatest relevance to *Turitea* is the target for an increase in renewable electricity generation capacity. At section 4.2.1 of the Energy Strategy, the Government has identified the 'adoption of a target for renewable electricity generation of 90 per cent by 2025 (based on delivered electricity in an average hydrological year)'.

¹⁴³ Pollock, EIC paras 212–219.

[289] Mr Pollock draws attention to Appendix 1 to Dr Layton's evidence, which identifies the current quantum of renewable electricity generation New Zealand is able to provide based on current installed capacity. This is approximately 27,969GWh (based on output of hydro, geothermal, wood and wind which are renewable resources). Based on an overall generation of 42,290GWh, this means that, at present, New Zealand can generate 66% of its electricity from renewable sources (based on 2007 figures). This leads to the conclusion that, in order to achieve the 90% target, a significant investment in new renewables projects will be required. These projects must also meet the sustainable management purpose of the RMA. Before the redesign, Mr Pollock notes that Dr Layton's evidence is that *Turitea* will add between 2.3% and 3.1% to annual generation rates (at 45% utilisation). In Mr Pollock's opinion, this is a significant contribution to electricity generation from a single project. While further renewable generation will be required to meet this target, with a requisite mix of renewable generation technology (ie, wind, hydro, geothermal and, perhaps in the future, marine/tidal), the *Turitea* proposal would provide a significant contribution to this target.

[290] The Energy Strategy is consistent with Dr Layton's conclusions, and it notes that there is likely to be enough geothermal, wind and hydro energy resources available to meet New Zealand's electricity demand for the next 20 years or so. It goes on to state that if marine generation (and other renewable sources) become economically viable within that time, New Zealand would be able to use predominantly renewable electricity sources for even longer.

[291] While the Energy Strategy provides clear direction for a focus on development of renewable energy generation, it also notes (at 4.6.4) that improved leadership and guidance will be provided through the RMA in relation to consenting such projects. These measures include the proposed NPS on renewable electricity generation which Mr Pollock discussed in his evidence.

[292] He considers the Energy Strategy to be relevant to this proposal because it provides a national context for the significance of renewable energy generation. Even after the redesign, the evidence of Dr Layton, in particular, supports this conclusion. Mr Pollock finds:

The economic and carbon avoidance benefits of the project have been reduced by virtue of the reduction in turbine numbers. Any further reduction benefits would concern me, in particular from the perspective of harnessing the wind and making the most sustainable use and development of this important natural feature. However, in my opinion, having considered the comments with respect to the redesign made by Dr Layton, the project remains nationally significant, and will deliver significant economic and climate change benefits to the country, and future generations, as a whole.¹⁴⁴

[293] In noting the change of government since the Energy Strategy was implemented, Mr Pollock observes the new government has repealed the prohibition on new thermal generation. Strong support for renewable energy

¹⁴⁴ Pollock, OS (2010) para 9.

remains, nevertheless, and, on this basis, in his view the Energy Strategy remains valid as *Turitea* will increase security of supply from a renewable source. Given the current government's statements in support of renewable energy, he considers that significant weight should be given to this document under s104(1)(c).

Finding

[294] In our Draft Report we found that the Energy Strategy was relevant and reasonably necessary in helping our determination of the application particularly in view of climate change issues. And do so again in this Final Report.

(b) New Zealand Energy Efficiency and Conservation Strategy

[295] Mr Pollock outlines the initiative taken in the NZEECS. It is a government action plan to maximise energy efficiency and renewable energy. The NZEECS states the Government's commitment to 90% renewable generation by 2025 and notes that meeting that target will require generating electricity from a 'diverse range of renewable sources such as wind, geothermal, hydro and biomass'.

[296] The NZEECS includes an objective which is: more energy efficient and competitive businesses using more renewable energy and emitting less carbon dioxide. The document states that it is in New Zealand's longer term and environmental interests to meet increases in demand through an economic mix of renewable energy sources that will meet security of supply objectives. The future mix of generation should ensure New Zealand's energy system is well placed to prosper in a low-carbon economy. To achieve this outcome requires a very high rate of investment in renewable generation, lower utilisation of existing thermal plant and decommissioning of older thermal plant. Again, citing Dr Layton, Mr Pollock considers that the *Turitea* wind farm proposal is consistent with the NZEECS.

Finding

[297] In our Draft Report, we acknowledged all that is identified in the NZEECS, and that MRP's proposal would assist in New Zealand's drive to meet security of supply of our renewable energy resources. And do so again in this Final Report.

Board's Response to MRP's Comments on the Draft Report relating to the Updated Energy Documents

[298] Mr Henry, in his second statement, revisited the Energy Strategy to 2050 and the NZEECS. Both documents are in the process of being reviewed after a further revision, in particular, the Energy Strategy in July 2010.

Discussion

[299] The information (some new, some not) that we took further account of in reassessing the updated statement provided by Mr Henry includes:

- a target of 90% of New Zealand's electricity generation should be from renewable resources by 2025 (in 2009, 73% of electricity came from renewable resources); the target is to be retained to assist the country to reduce its greenhouse gas emissions;¹⁴⁵
- recognition that all forms of energy generation have some environmental effects; proposals with unacceptable effects should not proceed;
- various regulatory methods will be introduced to guide future decision making (such as the NPSREG discussed above);
- while there is growth in new technology leading to other non-traditional sources of renewable energy generation, these are at a relatively early stage and are non-economic.

[300] There are two comments we make in respect of this particular information and its relevance to *Turitea*.

- The Objective in the NPSREG does not put a timeframe around the drive to achieve 90% renewable electricity generation by the year 2025; as noted above by Mr Henry, that goal is now 'aspirational'. The reason for this is given in the *Summary of Board of Inquiry recommendations and Minister for the Environment's decision on the NPSREG* as:

This change maintains the direct link to the Government's target as a strategic policy goal for renewable electricity. It ensures durability of the NPSREG and plan changes made to give effect to the NPSREG if there are changes to the target figure or date in the future.¹⁴⁶

- Whether proposals have unacceptable effects often become apparent only after rigorous testing of the evidence in the Environment Court or a Board of Inquiry.

Finding

[301] Because further reviews of both documents are taking place, because the NPSREG has superseded some of the information contained in them already, and other information is not new, we take note of the contents of the documents, but consider they do not advance the cause of the *Turitea* project above the knowledge already provided by MRP.

¹⁴⁵ Henry, Second Statement Appendix 1, para 3.14.

¹⁴⁶ Ministry for the Environment, April 2011, p9.

(c) Turitea Reserve Management Plan

[302] The Turitea Reserve Management Plan (TRMP) was initially prepared under the Reserves Act 1977 and provides a framework for the management and use of the Turitea Reserve. As noted in Mr Pollock's evidence, the TRMP was amended to provide for 'electricity generation' as an additional purpose. He identifies the TRMP contains a range of policies that seek to protect and manage the Reserve's values and attributes including water supply, indigenous vegetation, plantation forestry, landscape, amenity, fauna, cultural, historic and recreation – all of which contribute to the value of the reserve and require an integrated management approach.

[303] The 'Protecting Water Supply Quality and Storage' section of the TRMP, includes the following objectives:

- To maintain a high quality and secure water source.
- To maintain a low level of risk of contamination and preserve options in terms of future barriers to contamination.
- To minimise sediment input in reservoirs.

[304] Mr Pollock considers the construction activities that could potentially adversely affect water supply in the Turitea Reserve will be carefully managed. Citing the evidence of Mr Levy, Mr Pollock concludes that the construction, operation and maintenance of the wind farm will not adversely affect the Turitea water supply.

[305] The 'Conserving and Restoring Flora and Fauna, Ecosystems and Natural Landscapes', section of the TRMP includes the following objectives:

1. To protect indigenous flora and fauna, habitats and ecosystems within the reserve ...
2. To promote the restoration of indigenous plants, animals and habitats within the Reserve ...
5. To preserve and where practicable enhance the natural landscape values of the reserve, except where another objective in this plan is pursued in which case the impact on landscape values will be mitigated ...
6. To develop the Reserve as an ecological reservoir for the city by encouraging the development of ecological linkages and corridors, and helping to facilitate the implementation of the above objectives on private and public land adjacent to the Reserve.

[306] Mr Pollock considers these policies provide that the important values of the Reserve, including ecological and landscape values should be preserved, protected and restored. The exception to this is where another objective of the TRMP is pursued, which, based on the policies included in the TRMP on electricity generation (see below), could include the development of a wind farm. In this instance, the TRMP provides that the impact on landscape values will be mitigated, should these objectives be pursued. Mr Wyatt has identified a package

of mitigation measures in relation to landscape and visual effects, which in relation to the RMA context, is such that the potential adverse visual effects are considered acceptable. On this basis, it follows, in his opinion, that the proposal is also consistent with the TRMP.

[307] The final relevant section of the TRMP identified by Mr Pollock relates to ‘electricity generation’, and the following objectives and policies apply:

To allow electrical generation activities in the Reserve that do not compromise the Reserve’s function as a water supply catchment and ensure adverse effects and other values are appropriately mitigated...

Policy 1 Electrical generation projects will be considered in the Reserve where these do not compromise the achievement of the objectives of this management plan

Policy 1.2 Allow the installation of transmission lines and communication equipment as required by development of electricity generation.

[308] Under the TRMP, the purpose of the reserve is multi-faceted. However, this objective and Policy 1 make it clear that while a wind farm is contemplated, it must demonstrate that it can be constructed and operated without undue adverse effects on the other values of the Reserve, or other objectives of the TRMP. Mr Pollock outlined those other objectives above and does not consider, on the evidence available, that any will be compromised.

[309] Turning to adverse effects on other values, the objective specifically allows adverse effects to be mitigated, and in Mr Pollock’s opinion this means that some adverse effects are also contemplated – that is, the TRMP reinforces other aspects of the RMA policy framework that he interprets to mean the Reserve is not to be protected or preserved from all change. Rather the TRMP accepts that some appropriate change is able to occur in this already modified environment. In relation to these adverse effects, Mr Pollock points out that MRP has identified and provided a comprehensive ecological mitigation package under the RMA. This includes, most significantly, remediation of the ecological effects arising from vegetation clearance and involves significant areas (75 hectares) of revegetation in the reserve, pest and weed control and rehabilitation of up to 8 hectares of the affected areas. This remediation was described in his evidence and that of Mr Shaw.

[310] Overall, Mr Pollock concludes therefore that, provided the ‘footprint’ of any wind farm falls within the area defined in the TRMP, and the applicant can demonstrate the construction, operation and maintenance of the wind farm does not adversely affect the other values of the reserve, including its water supply function, a wind farm can be assessed as being consistent with the objectives of the TRMP. In accordance with the advice from MRP’s various experts, Mr Pollock believes that this will be the case for the Turitea wind farm project. He therefore considers that the proposal is consistent with the objectives and policies of the TRMP.

[311] The Board gave close attention to the fact that the TRMP provides, under Policy 1 of the electricity generation section, for ‘other values’ in the Turitea Reserve to be ‘mitigated’ by which we take it that such values will relate in this case (inter alia) to ecological, landscape, amenity and water quality issues.

[312] While this policy does not trump in any way the issues extant in s5(2)(c) RMA (that effects may be avoided), we note PNCC’s submission that the change to the purpose of the Reserve was a status decision and not an assessment of effects.¹⁴⁷ It caused us to think very hard about what may be ‘mitigated’ successfully. After a great deal of debate we came down to the fact that:

- an access road is required down to the southern series of turbines which had the least adverse effects on the amenity of the residents;
- several of the turbines are already located very close to the existing access road while others may be moved closer away from the significant native vegetation;
- while the existing access road along the Hardings Park ‘boundary’ has to be altered, it should be possible to offset the adverse effects this will have by restoration planting of the old water catchment access road.

[313] Foremost in our minds behind this anxiety was:

- the need to encourage ecological linkages and ecological corridors between the Turitea Reserve and Hardings Park Reserve;
- to preserve and, where practicable, enhance the natural landscape of the Reserve which will not be achieved visually when MRP’s wind turbines are placed along Back Ridge and so on; that is, in ecologically sensitive areas;
- to promote the restoration of indigenous plants, habitats and ecosystems within the Reserve as outlined in the TRMP.

[314] We are very conscious of the paucity of ecosystems around Palmerston North. We are also conscious the revenue available for use of turbines located within the Reserve will further enhance its ecology (by, for example, upscaling predator control).¹⁴⁸

Finding

[315] We concluded after assessing the TRMP that the only sustainable use of the Reserve was to utilise the modified area at its northern end and the margins of the water catchment access road and farmland at the southern end for turbines.

¹⁴⁷ Maassen, PNCC Opening Statement (2009), para 8.

¹⁴⁸ Baker, OS (March 2010), para 19.

Chapter 19: Part 2 Matters

Introduction

[1] In deciding whether this proposal meets the sustainable management purpose and principles of the RMA, we first of all make the distinction that ‘people’ in s5(2) encompass those who might benefit from the availability of the renewable energy from the Turitea wind farm, as well as the members of the public and Palmerston North City community who appreciate the visual amenity provided by the *Turitea* site. The ‘communities’ we assess as the residential communities as well as the landowners of the foothills around the *Turitea* site.

[2] We also note that s5 matters are informed by the issues raised in ss6, 7 and 8. We further address sustainability issues as in s5 towards the end of this chapter.

Section 6: Discussion and Findings

[3] Section 6(a) requires decision makers to recognise and provide for the natural character of (inter alia) wetlands, lakes, and rivers and their margins and their protection from inappropriate development.

[4] The evidence of MRP’s engineers and those of PNCC, together with that of the ecological experts, inform us that the water resources in the Turitea catchment have been properly identified and provided for (including the reservoirs which supply the city) in the resource consent conditions and various management plans now proposed.

[5] We note in this regard that native planting of the wetlands in Browns Flat will assist in the restoration of what appears to be, from Mr Shaw’s evidence, a potentially unique environment. Meanwhile the water quality of the water supply appears to be rigorously protected and monitored.

[6] Section 6(b) provides for the protection of outstanding natural features and landscapes from inappropriate development. The *Turitea* site demonstrates both an ONL and an ONF in terms of the Turitea Reserve and the skyline of that area. We consider they are so significant in their context for the residents of Palmerston North that they should be protected with as little modification as possible for the reasons given in Chapters 8 and 12.

[7] We note here that, in assessing s6(b) issues, we questioned whether the wind resource at the top of the Tararua Ranges could be identified as an outstanding natural feature in this location to bring it within this subsection. But after reflecting on submissions from MRP and PNCC, we conclude that counsel for PNCC is correct when he submits that Parliament did not intend to protect ‘elements’, ‘forces’ and ‘processes’, as distinct from modifiable natural and physical forms. There is a distinction thus to be made between ‘resources’ in s2 RMA and ‘features’ in s6(b). The intermittent nature of the wind resource (a

dynamic force/element) in the environment precludes it from being protected. While the *Turitea* wind forces are a contributor to the striking ‘shorn’ nature of the indigenous vegetation in most of the reserve, contributing also to the distinctive landcover we viewed on a site visit (and as seen in some of the Wyatt and Lucas documents), it is not something physical that may be modified – which is what the legislation anticipates may happen in s6(a) and (b) if the development is considered appropriate.¹

[8] The question arises as to whether a wind farm on the *Turitea* site is an appropriate development or not in terms of s6(a) and (b). We note the status of the Turitea Reserve has been approved by the High Court to encompass energy purposes, so to that extent it may be seen as an appropriate development in that location.² And as far as other wind farm developments have demonstrated (and as indeed the district plan provides for), turbines on rural lands in this location are *prima facie* not inappropriate. It is only when potential effects are characterised as ‘high’, ‘significant’ or ‘unacceptable’ that appropriateness may be called into question. Some of the effects from MRP’s revised design proposal, as we have identified, we find to be inappropriate.

[9] Meanwhile s6(c) requires the protection of significant indigenous vegetation and indigenous fauna. All experts consider most of the Turitea Reserve as an area of significant indigenous vegetation. We consider that while some turbines close to the roading may be acceptable because they will be located in land already disturbed, long access roads into the native vegetation, together with large concrete foundation pads for the turbines to remain possibly forever in these parts, do not protect this significant resource which currently provides 90% of the natural ecology for Palmerston North. It is not appropriate here to continue to chip away at such a significant and limited resource with developments on the scale of *Turitea*.

[10] Section 6(e) requires decision makers to recognise and provide for the relationship of Māori and their culture and traditions with their ancestral lands. We have concluded in Chapter 17 that MRP has suitably recognised and provided for this in its ongoing relationship with Rangitane and that this is given tangible authority by the parties in their MOU.

Section 7: Discussion and Findings

[11] Section 7(b) requires the decision makers to have particular regard to the efficient use of natural and physical resources. The effort MRP has put into making this wind farm an efficient use of *Turitea*’s resources has been a testing venture for the company and largely successful. The fact that it has been able to use the existing water catchment access road as its main access has given it a great advantage. This road also provides access for the construction of turbines on farmland to enable both farmers and the company to use that natural resource more efficiently. Meanwhile, wind farms on pastoral lands may also be seen to be

¹ Lucas Attachment 30 *Turitea Reserve Vegetation* and Appendix A.

² Decision A 132/2009, para 47.

efficient development of a rural resource, as we have seen in *Project West Wind* and the existing wind farms north of *Turitea*. And even after the redesign, with the number of turbines reduced, Dr Layton was able to say that the wind farm will still operate efficiently and economically – for which there was no rebuttal. Counsel for MRP in closing submitted that if any further turbines were removed the project would not be viable.³ We were not given any evidence before issuing the Draft Report to make that assumption and, accordingly, put those submissions to one side at that time. After re-examining the issue again, and having read Mr Henry’s second statement of evidence, we have not been assisted any further in resolving this matter prior to issuing this Final Report. Viability or otherwise is in any case for the company’s boardroom, not for this inquiry.

[12] As to s7(ba) the efficiency of the end use of energy, we adopt here the finding of the Environment Court in *Crest Energy Kaipara Limited v Northland Regional Council*, where, reflecting on the term ‘end use’ of electricity generated (in that case tidal energy from the Kaipara Harbour), the Court concluded that particular regard should be given to how efficiently given types of energy are used as an intermediate input into production processes (eg, efficiency in the use of energy in production from a geothermal plant, or from a thermal plant (gas or coal)), and further how this would extend to consideration of loss minimisation of the generated electricity in the transmission process.

[13] When applied to *Turitea*, the production of electricity from the harnessing of wind energy represents a particularly efficient (and most likely the only) use of that energy. In addition, efficiency is further enhanced through the location of the wind farm close to centres of significant energy demand, thereby minimising transmission losses. Overall, *Turitea* responds positively to satisfying s7(ba) of the Act.

[14] While discussing the other energy aspects of the case we are satisfied that the project is an effective development to help counter the effects of climate change (s7(i)), and that the benefits to be derived from the use and development of renewable energy (s7(j)) are those set out very convincingly in MRP’s closing submission⁴ and underpinned by the evidence of the relevant experts.

[15] As to s7(c) and (f) relating to the maintenance and enhancement of amenity values and the quality of the environment, in closing submissions, citing a Court of Appeal decision,⁵ counsel for MRP was dismissive of the strength of s7(c) and (f) citing their Honours as confirming that s7(c) does not ‘require’ the maintenance and enhancement of amenity values, let alone their preservation or protection. This is because the RMA contemplates applications for consent that not only do not enhance amenity, but also do not even maintain it. Counsel submits that the identical rationale applies to s7(f), which deals with maintenance and enhancement of the quality of the environment.

³ Price, MRP Closing Submission, para 2.14.

⁴ Ibid, MRP Closing Submission, paras 1.2–2.14 and paras 4.16, 4.18–4.19(a), (b), (c), (e), (f), (g) and (h).

⁵ *Shell New Zealand v Auckland City Council* [1996] NZRMA 189.

[16] We note that s7 requires all persons exercising functions and powers for the purpose of the Act, relating to the management of the use, development and protection of natural resources ‘to have particular regard’ to s7(c) and (f) just as it does to s7(i), ‘the effects of climate change’ and s7(j), ‘the benefits to be derived from the use and development of renewable energy’, and all other related provisions within the section. Counsel for MRP submits that the evidence of MRP demonstrates the company’s intention to have particular regard to the issues at hand as far as practicable without making the project non-viable. Counsel recognises the MRP evidence, provided in the light of the redesign, has shown that *Turitea* will cause changes to the landscape and that the landscape may qualify as an ‘amenity landscape’. But we are urged to consider that MRP has sought to minimise the visual effects of the proposal by removing those turbines in the most visually prominent locations, noting they will be coated with a low-reflectivity light-grey colour to lessen their impact on the rural working landscape, while landscape mitigation will be made available to those whose visual amenity may be impacted upon.⁶

[17] We consider, however, the energy provisions do not trump all others in s7. The definition of ‘amenity values’ is wider than just ‘amenity landscapes’.⁷ From the mix of attributes it encompasses are concerns about the prospect of a very large energy landscape (even after the redesign) intruding on the lives of the foothills residential communities, including its impact on recreational attributes. The concerns encompass particularly the effects of noise from the wind farm turbines and the loss of visual amenity of many of the residents.

[18] We are satisfied nevertheless that the agreed noise conditions should provide answers to the submitters’ noise concerns. We have concluded they address all the BPO provisions of s16 (with the exception of costs, which were not explored by anyone except Dr Thorne, and which his representatives did not take any further) and that MRP will take all practicable steps to ensure the provisions are rigorously implemented.

[19] As to visual amenity matters, Mr Wyatt addressed these specifically and those facilities that were highly or significantly affected could only be mitigated by planting, which the Board does not accept in this landscape is acceptable. Mr Brown also addressed what he considered were adverse landscape effects. He said in one part of his evidence this was his objective in the redesign, and in another part he assessed all the viewpoints originally identified and the views from around those particular areas. But he did not visit all the residential properties identified by Mr Wyatt,⁸ and we were left somewhat confused. If he was concentrating on public viewpoints then his deletions did not go far enough. Accordingly, we do not agree:

- that the massing of turbines that are unable to be remedied or mitigated from the public viewpoints (an assessment made by MRP’s own expert, Mr Wyatt) are acceptable;

⁶ Price, MRP Closing Submission, Section 7, paras 7.29–7.35.

⁷ See the definition in Chapter 13.

⁸ Brown, NOE 3013–3014.

- that where residential dwellings are within or close to the 2 kilometre contour, the turbines will remain dominant (not ‘most dominant’ in Mr Brown’s terms) to viewers and therefore cause significant adverse effects that are unacceptable.

Section 8 Treaty of Waitangi 1840: Discussion and Finding

[20] With regard to s8 RMA, the s42A cultural expert, Ms Forbes, posed an interesting proposition in her opening statements in the hearing. She stated that ‘s8 is not simply about addressing settlement processes but to include the principles of active protection, partnership, iwi autonomy and so on. I think you have to take into account the principle of active protection that gets you on the right track to having regard to kaitiakitanga as an example’.⁹

[21] This was stated in the context of iwi always being slotted into the culture silo and she felt they needed to be evident in the evidence on ecology, landscape, species recovery and so on. So if the applicant is taking into account the principles of the Treaty of Waitangi in terms of active protection and being the status of treaty partners, then they gain a status of having a broader and more comprehensive status.

[22] Counter to that is the view that s8 is not as significant in the RMA decision-making process in relation to s6(e) and s7(a). Added to this is the fact that many tāngata whenua groups in reality lack capacity to independently uphold certain roles unless by way of resourcing agreements with applicants. Another factor is the lack of integration in planning documentation such as district and regional plans.

[23] In this case, the Treaty principles were taken into account by three key measures. The first is to include a review condition that was negotiated by TMI to protect the potential outcome of any future Treaty settlement that may intersect with the lands involved with the wind farm proposal.

[24] The second measure is the development and agreement of two MOU with Rangitane o Manawatu and with Rangitane o Tamaki nui a Rua. These documents are important to take into account the Treaty principles of active protection and partnership, whilst also allowing the tino rangatiratanga of these two iwi to be upheld.

[25] The third measure was noted by Mr Henry, of MRP, in his supplementary evidence when he informed the Board that the applicant would be ‘establishing a tertiary scholarship’¹⁰ as part of its MOU with Rangitane o Manawatu which will assist in building the capacity of the iwi to uphold their position as Treaty partner into the future and can also be seen as taking into account the Treaty principle of active protection.

⁹ Forbes, NOE 945.

¹⁰ Henry, SE para 5.1(e).

[26] We find that the applicant has met the requirements of s8 by having a Treaty settlement review condition, an agreed MOU which upholds the partnership principle and, within that MOU, that the parties have agreed to funding a tertiary scholarship which enhances the capacity of the iwi therefore upholding the principle of active protection.

Section 5(1) and (2): Discussion and Findings

[27] We consider this is a critical section in our evaluation of this wind farm. For in agreeing to remove turbines which adversely affect the ONL and ONF of Turitea Reserve, and which adversely affect the public and private visual amenities of those in Palmerston North City and the foothills communities, we nevertheless spent a great deal of time in assessing how many turbines, and for what reasons we could retain as many of them as possible. Our concern around climate change issues and renewable energy directed this approach.

[28] For as Mr Pollock identified, and the Board did also at the outset of the inquiry, the positive benefits of this wind farm in this location are too important to ignore. Here, we do not give any dollar benefits because these will have changed since the redesign and the issue of the Draft Report, but the overall positive benefits remain:

- reduced reliance on fossil fuels for power generation use – the Turitea wind farm will increase the use of renewable energy resources thereby assisting the Government’s objectives in this regard;
- a contribution of around 1.7% to national generation capacity;
- a contribution to a reduction in CO₂ emissions or CO₂ displacement; this will contribute to meeting New Zealand’s obligations under the Kyoto Protocol;
- potential benefits for power consumers, through the suppression of price rises from the displacement of higher cost generation sources and the deferment of grid investments, which get passed on to all power consumers;
- the displacement of long distance power transmission with associated losses by providing generation in close proximity to load and gaining efficiency in power distribution;
- enhanced security of electricity supply, particularly during dry years;
- local economic benefits arising from the direct construction expenditure on the wind farm; and the employment of permanent staff to maintain the wind farm; local operational supplier spending and the indirect impacts from economic multipliers;

- reduction in New Zealand's Kyoto liability relative to non-renewable generation.¹¹

[29] It became very clear to the Board that, if the wind farm was to be consented in its entirety, part of the outstanding landscape or one or all of the outstanding features or areas of ecological significance, together with areas of public and private amenity would have to be modified under the provisions of s5(2)(c). These were areas proposed to accommodate some of the turbines.

[30] The 'people' factor (as in *Project West Wind*) took precedence in some areas, given the evidence of the effects the wind farm would have on the foothills communities, the residents of Palmerston North and those on the Manawatu Plains.

[31] As noted in Chapter 12, the Board heard evidence from all the landscape experts that, when viewed internally, parts of the Turitea Reserve could be considered outstanding. Mr Brown, for MRP, instigated this terminology as early as 2008 when he undertook his second assessment for the applicant, expressing the view that there can be little doubt that the Turitea Reserve, the adjoining Hardings Park and the northern reaches of the Tararua Forest Park are highly significant, perhaps even outstanding, when viewed from within.¹² He reiterated his views on its internal outstanding character under questioning, stating that the internal Turitea Reserve is an ONF¹³ and that Hardings Park is an ONL,¹⁴ being the start of an extensive outstanding natural landscape that focuses on the Tararua Forest Park. This view was subsequently reiterated to varying degrees by his peers. Mr Wyatt, for MRP, was least supportive of such a description, partly due to issues of visibility from outside the site, but he accepted that there were areas within the site that are outstanding or significant landscapes.¹⁵

[32] Mr Brown also coined the phrase 'signature feature' when referring to the relationship between Palmerston North and the Tararua Ranges, stating that the main ridges of Turitea are part of a continuum that stretches across the Tararua Forest Park, which is a focal feature in views from Palmerston North, and, as such, the wider range is undoubtedly a signature feature in relation to the Manawatu and Tararua communities. He reiterated this in cross-examination, confirming that the back ridgeline of the Turitea Reserve, as framed in the view south along Fitzherbert Avenue, symbolised this signature feature.¹⁶ Mr Pollock accepted this under questioning,¹⁷ and other landscape experts also supported this view.

[33] Considering the implications of this evidence, and bearing in mind the Board's finding that most of the Turitea Reserve is an ONL and contains ONF, consideration had to be given to the weight that should be placed on protection of

¹¹ Pollock, EIC para 53.

¹² Brown, *Turitea Wind Farm Assessment of Landscape and Amenity Effects*, June 2008, p66.

¹³ Ibid, NOE 3036, 3077.

¹⁴ Ibid, 3055.

¹⁵ Wyatt, NOE 1429.

¹⁶ Brown, NOE 3076.

¹⁷ Pollock, NOE 3802.

the outstanding natural features and landscapes from inappropriate development. It is clear from evidence presented at the inquiry that experts and many submitters empathised with Mr Brown's description of the ranges being a signature landscape for Palmerston North. It was also clear from observation and photographic evidence that many locations within Palmerston North view the internal Turitea Reserve, which we have found to be an ONF, and the skyline back ridge, which the RPS defines as outstanding and we also find to be outstanding.

[34] It is the Board's determination that the wind turbines on the Back Ridge would be an inappropriate development and would not protect this ONF. The affected turbines are WT15–WT29 and WT39–WT43, which are deleted. Turbines WT56–WT66 on Game Ridge also break the skyline and are deleted.

[35] In addition to these deletions for ONF protection, we have found that turbines WT15–WT20, WT39–WT43 and WT57–WT66 are also inappropriate and should be deleted for ecological reasons. This is because of the extensive native vegetation clearances which would be required for both access tracking and for the turbine platforms and the large concrete pads which would remain after consents have expired.

[36] Turbines WT127–WT131, WT134–WT136 and WT56 on Love Ridge cause adverse amenity effects on immediate properties due to their dominance and act as a picket fence, piercing the skyline when seen from public viewpoints within and around Palmerston North. Although not located within the reserve, the Board has concluded that their presence on a parallel ridge would extend the prominence of turbines across much of the visible internal parts of the Turitea Reserve, negating efforts to protect the skyline, the ONL and the ONF of Hardings Park. These turbines are deleted.

[37] In spite of some of the problematic turbines on Bryant Hill having been removed under MRP's redesign, the remainder in Group A occupy a significant stretch of landscape with most on a really clear day registering as being over the skyline, as well as appearing as an isolated 'breakaway' group. They would also maintain a dominating presence over nearby residential properties. For these reasons, the turbines in Group A (WT74–WT78) are deleted.

[38] WT95 is within 1 kilometre of the Grassick property and while the frontage of the Grassick house overlooks several *Te Rere Hau* turbines, the rear of the property is immediately adjacent to WT95. This turbine has been assessed as dominant and is deleted.

[39] We have concluded that WT30–WT37 and WT44–WT46 along the boundary with Hardings Park can be retained even though they would be placed in an area of ecological significance (an ONF and an ONL). It was felt that, given an upgraded access road would be instrumental to the construction of the body of the turbines in the south west, it would make sense to permit the construction of turbines alongside the road. This is on the basis, in response to a request in our Draft Report, that MRP was able to relocate turbines WT44–WT46 closer to the water catchment access road (in conjunction with some slight modifications to the positions of WT35–WT37).

[40] While the adverse effects on recreational users of Red Rock Knob from the placement of these turbines cannot be mitigated, and the placement of turbines across the continuum of the ONL is acknowledged, the reasons for the retention of these turbines are as follows:

- WT30–WT35 are substantially screened from many parts of Palmerston North by the high ground of Tirohanga and Game Ridge and, acknowledging Mr Brown’s reference to the ranges as a signature feature, and their role as a focal feature in views from Palmerston North, these turbines can remain while still providing for this reference;
- WT36–WT37 are acceptable as they form part of the visual grouping of the remaining Group G turbines and with the F and H groups;
- from our assessment of the Beca drawings for the turbine locations, these turbines (WT30–WT37) are located alongside the water catchment access road;
- the widening of the water catchment access road and its two new road alignments, even though through dominant horopito vegetation, will create access for the construction of 23 turbines in the G, H, and K (WT54) and F series turbines, which for 3MW turbines have the combined potential to generate up to 69MW of electricity;
- there will be mitigation of the resulting effects by rehabilitating with native vegetation those sections of the water catchment access road which will become redundant once the two new realignments have been put in place and some 10 hectares of rehabilitation and/or restoration has occurred of Browns Flat.

[41] The Board has decided that, if the turbine deletions and repositionings listed above are made, the project will meet all the provisions of s5(2) of the Act.

[42] The turbines that will remain will be 60 in number, being 33 in the north and 27 in the south, namely:

- Group C: WT67–WT71, WT96 (six turbines)**
- Group D: WT1–WT9, WT11–WT14, WT97–WT98, WT30–WT33 (19 turbines)**
- Group E: WT10, WT38, WT99–WT107, WT109 (12 turbines)**
- Group G: WT34–WT37, WT44–WT48, WT110 (10 turbines)**
- Group F: WT115–WT118 (four turbines)**
- Group H: WT52, WT111–WT114, WT119–WT121 (eight turbines)**
- Group K: WT54 (one turbine)**

[43] The retained turbines will separate the wind farm into two distinct groups which will frame the Turitea Reserve, emphasising its importance as an outstanding natural feature when viewed from Palmerston North and the

Manawatu Plains. Should additional wind farms to the south ever be sought and approved, the southern group could relate to these just as the northern group will relate to the range's existing wind farms, widening the framing and thus further emphasising the importance of the Turitea Reserve.

[44] While we respect MRP's request for more turbines to enhance the economic sustainability of the project, there are other considerations within Part 2 RMA that address the sustainable management of *all* the resources and values at risk here. From our perspective, we note that the consented *Turitea* wind farm will have 60 turbines, each with a capacity of up to 3MW and it seems to us that a wind farm of this size should be viable.

[45] To those submitters who were deeply disappointed that *Turitea* was not turned down in its entirety, the RMA concerns the sustainable management of an area's physical and natural resources. If some issues, such as the ONL around Hardings Park, have to be sacrificed for the benefits to be gained from renewable energy generation, then that weighing up is for the Board to carry out in relation to the relative scale and significance of the beneficial and adverse effects of achieving sustainable management of all the issues in s5(2) RMA.

Chapter 20: Conditions of Consent

Introduction

[1] At the time we published our Draft Report, the Resource Consent Conditions dated 28 March 2010 contained the latest draft of the conditions of consent for the wind farm. These conditions were supported by a second document Major Capital Works, Construction and Environmental Management Plan Turitea (CEMP) dated 30 March 2010.

[2] In preparing the Draft Report, we elected to undertake our evaluation of these conditions and CEMP on an individual subject chapter-by-chapter basis as opposed to completing a comprehensive evaluation in one consolidated chapter. In doing so, we noted that the conditions and CEMP, which were presented by MRP at the start of the hearing, were substantially modified during the course of the hearing to incorporate the updated information and expert caucusing agreements which emerged during the hearing.

Draft Report Summary of Review of Conditions and CEMP

[3] As a result of the individual chapter-by-chapter evaluation in our Draft Report, we requested MRP to review the conditions and CEMP in a number of subject areas. These were drawn together in the Draft Report as follows:

- consideration of a reduction of the width of the water catchment access road from 10 metres to 6 metres wherever this is feasible;
- confirmation that the sites for the Turitea Reserve cross-valley transmission towers will be constructed by hand with helicopters being used for the delivery of all labour, construction equipment and materials;
- for the water supply reservoirs, details of the proposed water quality monitoring programme and how the measures determined from this programme will be applied to the adaptive management of the construction and operation of the wind farm, with this programme to be developed and agreed in consultation with PNCC and HRC.
- if feasible, details of the relocation of WT44–WT46 close to the water catchment access road;
- inclusion in the conditions for the rehabilitation with native vegetation of those sections of the existing water catchment access road which will become redundant once the two new realignments have been put in place;
- details of the restoration and rehabilitation package at Browns Flat as requested in Chapter 8 of this report;

- consideration for inclusion in the conditions of Dr Joy's monitoring proposal for the streams which drain from the spoil disposal areas;
- in the spoil disposal areas, provision in the conditions for stormwater runoff to pass through at least 10 metres of rank grass buffer before reaching an ephemeral water course;
- the development, in consultation with PNCC and the local residents, of a revised schedule of restrictions for the use of Kahuterawa Road and Greens Road by construction traffic to include:
 - the restrictions already included in the 28 March 2010 Resource Consent Conditions with the possibility that the night-time restriction could finish at 6:30am instead of 7:00am;
 - the carry forward of the agreements reached in the 16 July 2009 Joint Statement of Traffic Experts, namely a limit of 34 for the maximum number of daily truck movements with this restriction to be limited to one defined period of four months duration except where truck access is required at times when the internal loop road is closed by the turbine erection crane either travelling along the loop road or obstructing this road during the erection of a turbine;
 - the restriction of construction traffic on Saturdays to a set number of light vehicles for the transport of construction workers over two short defined periods in the morning and the afternoon.
- A redrafting of the noise conditions to include:
 - Conditions 3.1 (a) to (c) and 3.2 to be replaced by:
 - (a) Except for times when the wind farm wind speed and background noise levels are such as to trigger a secondary noise limit, the turbines shall be designed, constructed, operated and maintained so that the wind farm sound levels ($L_{a90(10min)}$) shall not exceed the background sound level by more than 5dB, or a level of 40dBA($L_{a90(10min)}$), whichever is the greater;
 - (b) Where the wind farm wind speed is 6m/sec or lower, a secondary noise limit shall apply under which the turbines shall be designed, constructed, operated and maintained so that wind farm sound levels ($L_{a90(10min)}$) shall not exceed the background sound level by more than 5dB, or a level of 35dBA ($L_{a90(10min)}$), whichever is the greater;
 - (c) This secondary noise limit shall apply only between the hours of 10:00pm to 7:00am.
 - Condition 3.3 to be renumbered as 3.2.

- Condition 6.1 This section to be modified to include the detail of the noise prediction and measurement processes proposed by both Mr Lloyd and Dr Trevathan in the section titled Progressive Assessments and Measurements of Noise in Chapter 15 of this report, which includes both primary and secondary noise compliance.
- Appendix B of NZS6808:2010 sets out alternative methods for testing for SAC. For the avoidance of doubt which might arise during testing for these SAC and the subsequent interpretation of the results of this testing, the noise conditions (as opposed to the NMP) should define the specific method to be adopted for SAC noise testing for *Turitea*.
- Noise Monitoring Plan (NMP)
 - NMP 1.1(b) This defines ‘contributing turbines’. We could find no other reference in the noise conditions or NMP to ‘contributing turbines’ – this is important and needs to be taken forward for specific application within the noise conditions;
 - NMP 3.1 This provides for a minimum of three continuous noise monitoring terminals (NMT) to be installed at appropriate locations around the wind farm site, and moved as different turbines (or groups of turbines) become operational. Clearer definition is required as to the relationship of the locations of the NMT to ‘groups of turbines’ and what is meant by ‘groups of turbines’;
 - NMP 4.5 also needs the ‘groups of turbines’ definition;
 - NMP 4.7 to 4.13 provide for monitoring to determine any cumulative effects. At 4.8 reference is also made to ‘groups of turbines’ which needs better definition;

[4] The Draft Report noted that these changes requested by the Board to the conditions and the CEMP should not be taken as being exclusive. We acknowledged that there could well be other changes required either as a consequence of the decisions reached in the Draft Report, from MRP’s own analysis or requested by PNCC and HRC. As part of the review of the Draft Report, we invited these parties to submit a final set of agreed conditions and CEMP for our approval.

Responses on Board’s Request for Amendments to Conditions

[5] As we have noted in earlier chapters of this report, in conjunction with its comments on the Draft Report, MRP submitted a revised set of Resource Consent Conditions dated May 2011. By and large this revision included the amendments to the conditions requested by the Board in its Draft Report.

[6] Notwithstanding, in their comments, MRP, PNCC, HRC and DOC, as well as a number of submitters, proposed further changes to the conditions, particularly those on noise and traffic. These are discussed in the relevant chapters of this Final Report.

[7] Following our consideration of each of these proposed changes, we prepared the following tables titled noise, traffic and miscellaneous which summarise our final decisions on the outstanding conditions.

Noise Conditions

Condition (All Schedule 3)	Issue	Comment	Board Decision
18.2	Secondary noise limit, locations for measuring wind farm wind speed	In her comments on the Draft Report, Dr Huffman requested that the wind speed be measured at residences and not at the wind farm. Also that the speed should be 8 or 10m/sec.	Wind speed to be retained at 6m/sec. Condition to be modified to include provision for the measurement of the wind farm speed at two locations, one in the vicinity of the turbines at northern end of the wind farm (to be used for the residences at the northern end) and one at the southern end (to be used for the residences at the southern end).
22	Inclusion of NMP content in Conditions	In Draft Report, Board requested that specific content in NMP should be incorporated in the Conditions. MRP has responded that NMP should be retained as drafted to maintain flexibility.	Board does not agree and confirms its earlier request for inclusion in Conditions of most, if not all, of the content of the NMP as drafted by noise experts at their 23 March 2010 caucusing.
26	Noise Prediction Report	In the Draft Report, Board requested MRP to include condition proposed by Trevathan (and Lloyd) for noise measurements and predictions. Board request was precautionary to preclude risk of repetition of <i>Makara</i> noise problems, which only became apparent after all of wind farm had been installed and commissioned. MRP considers that this is not necessary. In its comments on Draft Report at para 31, PNCC and Lloyd support Board request and have proposed wording for a new Condition 26.4 to suit.	Board confirms its request to include a new Condition 26.4, with the wording proposed by PNCC and Lloyd as set out at para 31 of PNCC comments on Draft Report.

Condition (All Schedule 3)	Issue	Comment	Board Decision
28	Timing of noise condition reviews	In her comments on the Draft Report, Dr Huffman requested that, rather than the noise conditions being reviewed at one, three and five years post the completion of construction as proposed by MRP, these reviews should be undertaken annually throughout the life of the wind farm.	Condition 28 should be amended to retain the review periods proposed by MRP, but with the addition of five-yearly reviews throughout the life of the wind farm. Also, for the avoidance of doubt, the condition should note that, if MRP should elect to construct the wind farm in stages, the noise review timetable should commence from the end of the construction of the first stage.

Traffic Conditions

Condition (All Schedule 3)	Issue	Comment	Board Decision
30.2	Widening and so on of Greens Road	Beca drawing at Appendix 2 does not provide sufficient details of road width which should be a minimum 6.2m sealed width.	Modify drawing at Appendix 2 to show road cross-section with 6.2m sealed width.
40	Hours of Permitted Travel on Greens and Kahuterawa Roads	The 12:30 to 1:30pm provision for weekends and statutory holidays should be deleted, with this to be covered by the 10 light vehicle movement per day exception.	‘Movement’ should be defined as a single journey and not a return journey Remove the 12:30 to 1:30pm provision for weekends and statutory holidays.
41	Specific exceptions for light vehicle and truck access at any time for site security, emergencies, health and safety and environmental monitoring	Board acknowledges need for truck access for emergencies as per 41.3 but does not consider that there should be equivalent truck access for purposes defined in 41.1 and 41.2.	Introduction to Condition 41 to be reworded as follows: ‘In addition to the traffic permitted above, light vehicle access is allowed at any time for the purposes defined in 41.1 and 41.2, with light vehicle and truck access allowed at any time for the purposes defined in 41.3.’

Miscellaneous Conditions

Number (Schedules as Noted)	Proposed Condition	Comment	Board’s Decision
Schedule 1 Condition 1	Authorised Works, Lapse Date and Term	Information to be added to May 2011 draft.	Add new Condition 1.7 to provide for the attachment referred to above and reference to the Beca geospatial 1:2000 drawings modified for these layouts.

Number (Schedules as Noted)	Proposed Condition	Comment	Board's Decision
Private Landscape Mitigation	MRP offer to private landowners for landscape advice has been removed from latest draft of conditions	Dr Huffman requested reinstatement of MRP's offer. Board presumes MRP has removed this offer as a result of Draft Report criticism of effectiveness of landscape planting.	Confirm acceptance of MRP's decision to remove conditions for private landowner landscape advice.
Council Responses	Number of individual conditions throughout Consent Conditions contain provision for councils to respond within nominated timeframes with approvals/comments on various plans such as CEMP, NMP, environmental monitoring	As drafted, conditions state that if consent holder receives no response within the prescribed number of working days, MRP may proceed. HRC proposed all such conditions requiring their responses be removed. DOC noted that Exhibit 6 provided to the Board on 30 July 2009 confirms agreement between DOC and MRP that construction activities must not commence until written approval has been obtained.	All relevant approval conditions to be modified to include the DOC wording, 'A response should be provided within 30 working days of receipt of the plan. Construction activities must not commence until written certification has been obtained'.
Schedule 2 Condition 33	Trimming of vegetation post-construction	DOC commented that it is difficult to envisage need for trimming of vegetation post-construction. Board notes that the condition specifies that this is to be as outlined in the rehabilitation/revegetation plan.	This can be resolved at the time the plan is reviewed and certified by the regional council.
Schedule 2 Condition 35	Extent of rehabilitation/restoration of Browns Flat	DOC considered that extent of rehabilitation/restoration now proposed by MRP for Browns Flat following Board's Draft Report decision to delete number of turbines is too low and needs to be increased.	Board acknowledges that its Draft Report decision has reduced vegetation clearances required to very low levels and that the quantum of rehabilitation/restoration proposed by MRP for Browns Flat is consistent with these low levels. Board confirms acceptability of condition as proposed except that no plan has been included at Appendix 3. The absence of this plan is discussed further under Schedule 3 Appendices below.

Number (Schedules as Noted)	Proposed Condition	Comment	Board's Decision
Schedule 1 Conditions 14 to 18	Membership of Community Liaison Group (CLG) and development of Terms of Reference (TOR)	Dr Huffman noted that condition 17 requires TOR to be developed by consent holder and councils and requests that CLG should also be involved in development of TOR. Also that condition 18 should specify adequate time for first meeting of CLG ahead of start of construction. Adams' have requested that Huatau Marae be invited to nominate representative on CLG as the marae is much more affected than say Rangitane o Tamaki nui a Rua.	1. Condition as drafted provides for CLG to vary its functions as it thinks fit. This should address concerns over preparation and content of TOR. It would be very difficult and unwieldy to include all members of CLG in developing initial TOR. No change required. 2. Condition 18 should include provision for first meeting of CLG to be held at least 60 days before start of construction. 2. Provision is to be included for all residents of Kahuterawa Road and Greens Road to be invited to have one representative on CLG. This could be (but does need to be) a representative of Huatau Marae.
Schedule 2 Conditions 20, 21	Complaints Register	Dr Huffman asked where the complaints register be held and who would have access?	Board notes that latest conditions require that Complaints Register be available within five working days to respective council's Environmental Compliance Manager upon request. No change required to conditions.
Schedule 3 Condition 57	Turbine lighting	Dr Huffman noted that the Condition requires the consent holder to respond if lighting becomes a nuisance. Dr Huffman asks for definition of nuisance.	No change required.
Schedule 3 Condition 58	Consent holder to respond as soon as practicable if turbines affect television reception	Dr Huffman asked for time definition of 'as soon as practicable'?	No change required.

Number (Schedules as Noted)	Proposed Condition	Comment	Board's Decision
Schedule 1 Condition 23	Decommissioning	Dr Huffman requested that decommissioning should include removal of turbine footings. Mrs Mildon requested that individual turbines should be removed if these are decommissioned ahead of decommissioning of overall wind farm.	Removal of footings would result in considerable damage to surrounding vegetation. No change required to conditions. Condition 23 as drafted makes no provision for decommissioning of an individual turbine (or turbines) if the consent holder decides to cease operations of that turbine

Number (Schedules as Noted)	Proposed Condition	Comment	Board's Decision
			(or turbines) ahead of ceasing operations for the overall wind farm. MRP requested to include a provision in Condition 23 to cover this eventuality. For guidance, MRP was directed to the relevant decommissioning conditions for Contact Energy's recently consented Hauāuru mā raki wind farm. Final conditions contain provision acceptable to Board.
Schedule 2 Appendices 3, 4 and 5	Plans for (3) Browns Flat Rehabilitation/ Restoration Area; (4) Pre-construction Avian and Bat Utilisation Survey Area Plans and (5) Existing Wetlands within Browns Flat	DOC noted that copies of these plans have not been provided in the Schedule 3 condition appendices and requested that these plans be circulated to the parties for comment prior to the decision being finalised.	In Conditions 35.1, 35.2 and 35.3 the words after '... Browns Flat' in each condition should be deleted. In Condition 37.2, add the words 'for each of the options set out in conditions 35.1, 35.2 and 35.3 which are to be determined in consultation with the Palmerston North City Council'. In Condition 37, add a new sub-condition 'A plan of the existing wetlands within Browns Flat'. In Condition 46 the words after '... Utilisation Survey' should be deleted. In its place, the information in Condition 47 should be amended to include 'the preparation of the site plan of the area to be covered by the survey'. Delete Appendices 3, 4 and 5.

[8] These tables were sent to MRP and PNCC with a request for MRP, in consultation with PNCC, to prepare for our approval a set of final conditions.

[9] In its response, MRP provided a set of final conditions the *Turitea Wind Farm – Resource Consent Conditions, 5 August 2011*. These have been accepted by the Board and are attached to this Final Report.

Consent Lapsing Period

[10] As noted in Chapter 1, under s125 RMA, a resource consent lapses five years from the date of its commencement unless it has been given effect to before the end of this period or the resource consent expressly provides for a longer lapsing period.

[11] MRP has requested that all of the resource consents have a 10-year lapse period. MRP's reasons for requesting this period are based on a number of factors, including New Zealand's demand for electricity, the availability of the design of turbines at a favourable exchange rate and the pre-construction studies to be undertaken. MRP has submitted that a 10-year lapse period will provide it with enough flexibility to enable the full implementation of the proposed development should these factors not be favourable within the normal five-year timeframe. On balance, we have decided that these factors outweigh submitter concerns over extended uncertainty that a 10-year lapse period might create for them.

[12] We reaffirm our Draft Report decision, as provided for in the approved Resource Consent Conditions, for a 10-year lapse period. For the avoidance of doubt, this lapse period shall apply to the overall Turitea wind farm irrespective of whether MRP elects to develop the wind farm in stages, that is, if constructed in stages, a start on all stages must have been made within the 10-year lapse period.

Consent Duration

[13] MRP has sought the maximum duration for resource consents associated with the project as allowed for under s123 RMA. These terms are as follows:

- Land Use Consents (under s9 RMA): Unlimited;
- Land Use Consent (under s13 of the RMA): 35 years;
- Water Permit (under s14 RMA): 35 years;
- Discharge Permit (under s15 RMA): 35 years.

[14] The wind farm¹ involves the long-term lease of both public and private land. Section 218(1)(a)(iii) RMA provides that:

(1) In this Act, the term subdivision of land means-

The division of an allotment –

...

- (iii) by a lease of part of the allotment, including renewals, is or could be for a term of more than 35 years ...

[15] MRP advises that the leasing of land for the project is deemed to be a subdivision and a subdivision consent will be required from PNCC and TDC for the wind farm. Applications for these will be lodged with the relevant council once the lease areas for turbines and roads have been confirmed with the relevant landowners during the detailed design phase.

[16] For a project of this magnitude and kind, and with the level of investment required, we consider that the requested 35-year term for the consents is appropriate and a 35-year term is agreed.

¹ MRP, *Turitea Wind Farm Assessment of Environmental Effects*, August 2008, p8.

BOARD OF INQUIRY

**Turitea Wind
Farm Proposal**

**FINAL REPORT
AND DECISION OF THE
BOARD OF INQUIRY INTO THE
TURITEA WIND FARM
PROPOSAL**

**Volume 2
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Membership of the Board and Appendices**

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PART A: Definitions

In these consents, unless the context requires otherwise:

The Act means the Resource Management Act 1991 (including all subsequent amendments)

AEMRP means the Adaptive Aquatic Ecology Management Response Plan prepared in accordance with condition 30 of Schedule 2

AEP means annual exceedance probability

Bulk earthworks means the cut and fill earthworks required to re-grade an area. It also applies to larger scale earthworks such as for building excavations

CAA means the Civil Aviation Authority

CEMP means the Construction Environmental Management Plan prepared in accordance with condition 6 of Schedule 1

CLG means the community liaison group established in accordance with condition 14 of Schedule 1

CNMP means the Construction Noise Management Plan prepared in accordance with condition 15 of Schedule 3

Contributing turbines means the 10 closest turbines to a particular monitoring site

CTMP means the Construction Traffic Management Plan prepared in accordance with condition 70 of Schedule 3

Environmental Compliance Manager means the Environmental Compliance Manager at each or all of the Manawatu-Wanganui Regional Council and Tararua District Councils, and the Head of Planning at Palmerston North City Council, as relevant

Local iwi means Te Rangimarie Marae Committee, Tanenuiarangi Manawatu Incorporated and Rangitāne o Tamaki Nui a Rua, as relevant

Movement in terms of vehicle movements means a single journey (i.e. a vehicle making a return journey to the wind farm site is counted as 2 vehicle movements)

NMP means the Noise Management Plan prepared in accordance with condition 22 of Schedule 3

NMT means the Noise Monitoring Terminals installed in accordance with condition 29 of Schedule 3

Northern Turbine Zones means those turbine zones within the area “Northern Turbine Zones” shown in the plan attached as Attachment 4

NZS6081 means *New Zealand Standard 6801:2008 Measurement of environmental sound*

NZS6802 means *New Zealand Standard 6802:2008 Acoustics – Environmental Noise*

NZS6803 means *New Zealand Standard 6803:1999 Acoustics – Construction Noise*

NZS6808 means *New Zealand Standard 6808:2010 Acoustics – Wind Farm Noise*

Operational means when a turbine’s blades first begin to rotate

Principal Planner means the Principal Planner at each or all of the Manawatu-Wanganui Regional Council and Tararua District Council, and the Head of Planning at Palmerston North City Council, as relevant

SEMP means the Site Environmental Management Plan prepared in accordance with condition 8 of Schedule 1

Site means the application site, as shown in the figure attached as Attachment 2

Southern Turbine Zones means those turbine zones within the area “Southern Turbine Zones” shown in the plan attached as Attachment 4

Statutory holidays means New Year's Day, Waitangi Day, Good Friday, Easter Monday, Anzac Day, the Sovereign's birthday, Labour Day, Christmas Day and Boxing Day

Threatened avifauna species means those avifauna species identified as threatened by Miskelly et al 2008 [Conservation status of New Zealand Birds, 2008, Miskelly C.M., Dowding J.E., Elliot G.P., Hitchmough R.A., Powlesland R.G., Roberston H.A., Sagar P.M., Scofield R.P., and Taylor G.A, 2008. Notornis 55: 117-135.], or its subsequent equivalent

Threatened bat species means those bat species identified as threatened by Hitchmough et al. 2007 [New Zealand Threat Classification System Lists - 2005, Rod Hitchmough, Leigh Bull and Pam Cromarty (comp), January 2007, Department of Conservation, 194p (ISBN 0-478-14128-9)], or its subsequent equivalent

Threatened herpetofauna species means those herpetofauna species identified as threatened by Hitchmough et al. 2007 [New Zealand Threat Classification System Lists - 2005, Rod Hitchmough, Leigh Bull and Pam Cromarty (comp), January 2007, Department of Conservation, 194p (ISBN 0-478-14128-9)], or its subsequent equivalent

Turbine Platform means the area used for construction of a turbine, including the crane pad, off-loading area and foundation, as shown in the diagram attached as Attachment 1

Truck means a vehicle with a gross vehicle mass exceeding 3,500kg which requires a class 2, 3, 4, or 5 driver licence to operate

Water Supply Catchment means the area shown in the figure attached as Attachment 3

PART B: Manawatu-Wanganui Regional Council

Discharge Permit 104553: For Vegetation Clearance and Land Disturbance

General

1. Consent 104553 is subject to compliance with Schedule 1 and Schedule 2 (attached).

Review of Conditions

2. In accordance with section 128 of the Act, the Manawatu-Wanganui Regional Council may annually from the commencement of construction works, and then at 5 yearly intervals after the date the wind farm becomes fully operational, during the month of July serve notice on the Consent Holder of its intention to review any of the conditions of this consent for any of the following purposes:
 - 2.1 To deal with any adverse effects on the environment that may arise from the exercise of the consent which it is appropriate to deal with at a later stage; or
 - 2.2 For the purpose of requiring reasonable steps to be taken to avoid, remedy or mitigate any adverse effect on the environment that may arise from the exercise of this consent and that was not anticipated at the time of commencement of the consent.

Discharge Permit 104555: For the Discharge of Dust to Air from the Concrete Batching Plants

General

1. Consent 104555 is subject to compliance with Schedule 1 and Schedule 2 (attached).

Dust from the Concrete Batching Plants

2. Any spillages of cement or cement dust from the handling of cement shall be contained as far as practicable and cleaned up immediately.
3. All air displaced from the cement storage silos shall be routed to adequate dust control equipment and filtered as far as practicable before discharge to the atmosphere.

Review of Conditions

4. In accordance with section 128 of the Act, the Manawatu-Wanganui Regional Council may annually from the commencement of construction works, and then at 5 yearly intervals after the date the wind farm becomes fully operational, during the month of July serve notice on the Consent Holder of its intention to review any of the conditions of this consent for any of the following purposes:
 - 4.1 To deal with any adverse effects on the environment that may arise from the exercise of the consent which it is appropriate to deal with at a later stage; or
 - 4.2 For the purpose of requiring reasonable steps to be taken to avoid, remedy or mitigate any adverse effect on the environment that may arise from the exercise of this consent and that was not anticipated at the time of commencement of the consent.

Discharge Permit 104556: For the Discharge of Dust to Air from the Mobile Crushing Plants

General

1. Consent 104556 is subject to compliance with Schedule 1 and Schedule 2 (attached).

Review of Conditions

2. In accordance with section 128 of the Act, the Manawatu-Wanganui Regional Council may annually from the commencement of construction works, and then at 5 yearly intervals after the date the wind farm becomes fully operational, during the month of July serve notice on the Consent Holder of its intention to review any of the conditions of this consent for any of the following purposes:
 - 2.1 To deal with any adverse effects on the environment that may arise from the exercise of the consent which it is appropriate to deal with at a later stage; or
 - 2.2 For the purpose of requiring reasonable steps to be taken to avoid, remedy or mitigate any adverse effect on the environment that may arise from the exercise of this consent and that was not anticipated at the time of commencement of the consent.

Discharge Permit 104557: For the Discharge of Wastewater from 2 Operations and Maintenance Facilities to Land

General

1. Consent 104557 is subject to compliance with Schedule 1 and Schedule 2 (attached).

Wastewater Management

2. There shall be no direct surface discharge of wastewater to the Water Supply Catchment, or to any flowing watercourse, drainage ditch which contains water, ephemeral drain, wetland or permanent pond.
3. The discharge of primary treated effluent (septic tank treated) from ablution facilities at the Operations and Maintenance Building shall be undertaken in accordance with the application and supplementary documents as outlined in Condition 1 and the Manawatu-Wanganui (Horizons) Regional Council's manual for On-Site Wastewater Systems Design and Management 2007 (or its subsequent equivalent).
4. The Consent Holder shall ensure that the effluent treatment and disposal system is installed by an appropriately qualified person(s).
5. On completion of construction of the operations and maintenance facilities, the Consent Holder shall ensure that annual maintenance and inspections of the disposal field and treatment system are undertaken and maintenance records are kept. A written report outlining the annual maintenance activities, and results of the annual inspection, shall be provided to the Manawatu-Wanganui Council's Environmental Protection Manager within 1 month of the inspections being completed.

Review of Conditions

6. In accordance with section 128 of the Act, the Manawatu-Wanganui Regional Council may annually from the commencement of construction works, and then at 5 yearly intervals after the date the wind farm becomes fully operational, during the month of July serve notice on the Consent Holder of its intention to review any of the conditions of this consent for any of the following purposes:
- 6.1 To deal with any adverse effects on the environment that may arise from the exercise of the consent which it is appropriate to deal with at a later stage; or
 - 6.2 For the purpose of requiring reasonable steps to be taken to avoid, remedy or mitigate any adverse effect on the environment that may arise from the exercise of this consent and that was not anticipated at the time of commencement of the consent.

Discharge Permit 104558: For the Discharge of Stormwater from Substations to Land

General

1. Consent 104558 is subject to compliance with Schedule 1 and Schedule 2 (attached).

Stormwater Management

2. The CEMP shall include appropriate measures to avoid erosion as a result of stormwater discharge from substations both at the discharge point and in any downstream receiving water body.
3. There shall be no discharge of stormwater from the stormwater collection and treatment system to the Water Supply Catchment.
4. The substation transformer(s) shall be bunded, with the bund sized to accommodate 110% of the oil storage volume, plus a 1% AEP 24 hour rainfall depth on the bunded area.
5. The Consent Holder shall maintain all structures used for the collection, treatment and disposal of stormwater on site in a serviceable condition at all times.
6. The Consent Holder shall, at all times other than when a 10% AEP rainfall event is exceeded, operate the stormwater collection and treatment system in a manner that will avoid any of the following effects that may result from the discharge of stormwater to surface receiving waters (compared with that measured upstream of the discharge point for waterways, or that measured in an unaffected but nearby point in a still water body):
 - 6.1 the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;
 - 6.2 any conspicuous change in the colour or visual clarity;

- 6.3 any emission of objectionable odour;
- 6.4 the rendering of fresh water unsuitable for consumption by farm animals; and
- 6.5 any significant adverse effects on aquatic life.

Review of Conditions

- 7. In accordance with section 128 of the Act, the Manawatu-Wanganui Regional Council may annually from the commencement of construction works, and then at 5 yearly intervals after the date the wind farm becomes fully operational, during the month of July serve notice on the Consent Holder of its intention to review any of the conditions of this consent for any of the following purposes:
 - 7.1 To deal with any adverse effects on the environment that may arise from the exercise of the consent which it is appropriate to deal with at a later stage; or
 - 7.2 For the purpose of requiring reasonable steps to avoid, remedy or mitigate any adverse effect on the environment that may arise from the exercise of this consent and that was not anticipated at the time of commencement of the consent.

Discharge Permit 104559: For the Discharge of Cleanfill to Land

General

1. Consent 104559 is subject to compliance with Schedule 1 and Schedule 2 (attached).

Review of Conditions

2. In accordance with section 128 of the Act, the Manawatu-Wanganui Regional Council may annually from the commencement of construction works, and then at 5 yearly intervals after the date the wind farm becomes fully operational, during the month of July serve notice on the Consent Holder of its intention to review any of the conditions of this consent for any of the following purposes:
 - 2.1 To deal with any adverse effects on the environment that may arise from the exercise of the consent which it is appropriate to deal with at a later stage; or
 - 2.2 For the purpose of requiring reasonable steps to be taken to avoid, remedy or mitigate any adverse effect on the environment that may arise from the exercise of this consent and that was not anticipated at the time of commencement of the consent.

Discharge Permit 104560: For the Discharge of Stormwater from Roads and Turbine Platforms, and Other Areas to Land

General

1. Consent 104560 is subject to compliance with Schedule 1 and Schedule 2 (attached).

Stormwater Management

2. The CEMP shall include appropriate measures to avoid erosion as a result of stormwater discharge from roads, turbine platforms and other wind farm-related work areas both at the discharge point and in any downstream receiving water body.
3. The Consent Holder shall maintain all structures used for the collection, treatment and disposal of stormwater to water on site in a serviceable condition at all times.

Review of Conditions

4. In accordance with section 128 of the Act, the Manawatu-Wanganui Regional Council may annually from the commencement of construction works, and then at 5 yearly intervals after the date the wind farm becomes fully operational, during the month of July serve notice on the Consent Holder of its intention to review any of the conditions of this consent for any of the following purposes:
 - 4.1 To deal with any adverse effects on the environment that may arise from the exercise of the consent which it is appropriate to deal with at a later stage; or
 - 4.2 For the purpose of requiring reasonable steps to be take to avoid, remedy or mitigate any adverse effect on the environment that may arise from the exercise of this consent and that was not anticipated at the time of commencement of the consent.

PART C: Palmerston North City Council Land Use Consent RC0068

General

1. Consent RC0068 is subject to compliance with Schedule 1 and Schedule 3 (attached).

Concrete Batching Plant Removal

2. The concrete batching plant(s) shall be removed within 6 months of completion of all construction works.

Review of Conditions

3. In accordance with section 128 of the Act, the Palmerston North City Council may annually from the commencement of construction works, and then at 5 yearly intervals after the date the wind farm becomes fully operational, during the month of July serve notice on the Consent Holder of its intention to review any of the conditions of this consent for any of the following purposes:
 - 3.1 To deal with any adverse effects on the environment that may arise from the exercise of the consent which it is appropriate to deal with at a later stage; or
 - 3.2 For the purpose of requiring reasonable steps to be taken to avoid, remedy or mitigate any adverse effect on the environment that may arise from the exercise of this consent and that was not anticipated at the time of commencement of the consent.

PART D: Tararua District Council Land Use Consent 1448

General

1. Consent 1448 is subject to compliance with Schedule 1 and Schedule 3 (attached).

Review of Conditions

2. In accordance with section 128 of the Act, the Tararua District Council may annually from the commencement of construction works, and then at 5 yearly intervals after the date the wind farm becomes fully operational, during the month of July serve notice on the Consent Holder of its intention to review any of the conditions of this consent for any of the following purposes:
 - 2.1 To deal with any adverse effects on the environment that may arise from the exercise of the consent which it is appropriate to deal with at a later stage; or
 - 2.2 For the purpose of requiring reasonable steps to be taken to avoid, remedy or mitigate any adverse effect on the environment that may arise from the exercise of this consent and that was not anticipated at the time of commencement of the consent.

SCHEDULE 1: Conditions relevant to Manawatu-Wanganui Regional Council, Palmerston North City Council, and Tararua District Council Consents

General Conditions

Authorised Works, Lapse Date and Term

1. The proposed development shall be undertaken in general accordance with the plans and information submitted with Mighty River Power's resource consent applications dated 8 August 2008 and numbered 104553 – 104560 by Manawatu-Wanganui Regional Council, RC0068 by Palmerston North City Council, and 1448 by Tararua District Council, as modified by:
 - 1.1 Mighty River Power's responses to requests for further information under section 92 of the Act dated (respectively):
 - a. 19 and 26 September, and 7 October 2008 (Manawatu-Wanganui Regional Council); and
 - b. 2, 10 and 24 October, and 5 November 2008 (Palmerston North City Council and Tararua District Council).
 - 1.2 A letter from Manawatu-Wanganui Regional Council dated 14 October 2008, following Mighty River Power's responses to requests for further information under section 92 of the Act (with respect to the consents required for the project from Horizons);
 - 1.3 Mighty River Power's *Revised Layout and Associated Information* document dated January 2009;
 - 1.4 The plan attached to the public notification of the applications dated 24 January 2009;

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- 1.5 Any other documentation submitted by Mighty River Power relevant to the applications;
 - 1.6 Mighty River Power's *Assessment of Environmental Effects – Turitea Wind Farm Redesign* document dated February 2010; and
 - 1.7 The Board of Inquiry's Final Decision on Mighty River Power's applications.
 2. For the purposes of section 125(1) of the Act, these consents shall lapse if not given effect to within 10 years after the date of commencement of the consents.
 3. The terms for land use consents (under section 13 of the Act) and discharge permits shall be for a period of 35 years from the date of commencement of the consents.
 4. The Consent Holder shall provide a copy of these conditions to any operator or contractor undertaking works authorised by these consents, prior to the works commencing.
 5. The consents are granted by each Council subject to its officers or agents being permitted access to the property at all reasonable times for the purpose of carrying out inspections, surveys, investigations, tests, measurements or taking samples.

Management Plans

Construction Environmental Management Plan (CEMP)

6. At least 40 working days prior to the commencement of any construction works, the Consent Holder shall submit a detailed CEMP to the Environmental Compliance Manager at each respective Council, for review acting in a technical certification capacity. A response should be provided within 30 working days of receipt. Construction activities must not commence until written certification has been obtained. The CEMP shall be prepared with the assistance of a suitably qualified environmental management specialist, and shall include, but not be limited to, the following:

- 6.1 Objectives of the environmental management process;
- 6.2 Outline of the relevant statutory and contractual requirements;
- 6.3 Proposed construction methodology and timetable for all construction works;
- 6.4 A process for reviewing the CEMP, including the process for developing and advising each Council of revisions;
- 6.5 Roles and responsibilities, including appointment of an Environmental Manager who is:
 - a. based on the construction site for the duration of the construction works;
 - b. responsible for compliance with the CEMP, SEMP's and these conditions;
 - c. contractually authorised by the Consent Holder to issue instructions to any contractor working on site as required to ensure compliance with these conditions; and
 - d. available to meet with the respective Council's Environmental Compliance Managers as required to review issues relating to these conditions.
- 6.6 Training to ensure all contractors are made aware of the conditions of these consents and of the need to comply with them at all times;
- 6.7 Procedures for keeping records of public complaints and any action taken in response to such complaints in accordance with condition 19;
- 6.8 Methodology for preparing SEMP's for each of the relevant sub-catchment areas;

- 6.9 An outline of the key potential environmental effects and measures to be adopted to avoid or mitigate these;
- 6.10 An Accidental Discovery Protocol in relation to archaeological sites;
- 6.11 Emergency responses for managing hazardous substances and any spills, including a contingency plan for:
- a. Riparian zone restoration and de-silting of the Palmerston North City Council water supply reservoirs in the event of significant erosion / washout events occurring during and caused by construction of the wind farm;
 - b. Early notification of downstream users and monitoring of a cleanup response in the event of significant spillage of hydrocarbons / concrete products to watercourses occurring during construction of the wind farm; and
 - c. The removal and disposal of cleared vegetation offsite in the event of significant release of nutrients / BOD from moribund vegetation bunds at turbine sites occurring during construction of the wind farm; and
- 6.12 Procedures for inspections, monitoring and reporting.
7. Where any of the Environmental Compliance Managers advise in accordance with condition 6 that the CEMP is not consistent with these consent conditions, their written response must outline these inconsistencies to the Consent Holder. If the Consent Holder receives written notification from any of the Environmental Compliance Managers that the CEMP is not consistent with the consent conditions, the Consent Holder shall modify the CEMP as necessary and resubmit it to the Environmental Compliance Managers no later than 10 working days prior to any construction works commencing. A response should be provided within 30 working days of receipt. Construction activities must not commence until written certification has been obtained.

Site Environmental Management Plan (SEMP)

8. The Consent Holder shall prepare and submit to the Environmental Compliance Manager, at each respective Council, a SEMP for each of the South Range Road, Water Catchment Access Road, Western Ridge, Browns Flat and Cross Valley Transmission and Out of Reserve (farmland) sub-catchment areas. The breakdown of the site into individual SEMPs may be varied by the Consent Holder as necessary to reflect any change to the design and construction programmes.
9. Each SEMP shall be prepared by a group of suitably qualified experts (including input from the Consent Holder, contractor, designer, environmental specialist, erosion and sediment control specialist and (for the walkover only) the consent authority). The preparation of the SEMP shall include, but not be limited to, an on-site meeting and walk-over of each sub-catchment area by this group of experts.
10. Each SEMP shall be submitted to the Environmental Compliance Managers for review, acting in a technical certification capacity, at least 30 working days prior to bulk earthworks commencing in each SEMP area. A response should be provided within 30 working days of receipt. Construction activities must not commence in the relevant SEMP area until written certification has been obtained. The purpose of the SEMP is to indicate how the CEMP will be applied on a site specific basis.
11. Each SEMP shall include the following as appropriate to each individual sub-catchment area:
 - 11.1 A location plan;
 - 11.2 A description of the work to be undertaken;
 - 11.3 Contact details for the contractor(s) undertaking the work;
 - 11.4 A work programme;
 - 11.5 A method statement covering construction method, monitoring and contingencies;

11.6 Design for the works covered by the SEMP, showing:

- a. Areas to be disturbed;
- b. Vegetation clearance methods and vegetation stockpiling;
- c. Fill areas;
- d. Spoil stockpile and disposal areas;
- e. Culverts and associated works in watercourses;
- f. Step by step criteria for determining the appropriate use of erosion and sediment control measures, including cut off drains, surface water control works, sediment ponds, flocculation measures (if required), and progressive rehabilitation of earthworks areas;
- g. Stormwater management measures; including both temporary and permanent measures;
- h. Re-vegetation and rehabilitation (identification of re-vegetation to be undertaken and re-vegetation methods and any maintenance);
- i. Inspection and reporting schedule in particular in response to adverse weather conditions;
- j. Maintenance and monitoring activities;
- k. Storage and handling of fuels and hazardous material and contingency measures for containment of spills; and
- l. Decommissioning and re-stabilising of sediment ponds, and other erosion and sediment control measures, at the completion of construction.

12. In addition to the requirements of condition 11 above, the SEMP for the Cross Valley Transmission sub-catchment area (between the Browns Flat and Plantation substations) shall include the following:

12.1 In areas where this is identified by a suitably qualified and experienced ecologist engaged by the Consent Holder as being necessary in order to minimise the impact on the surrounding vegetation, the footprint area for the transmission line support structures will be cleared by hand; and

12.2 All components for the identified transmission line support structures, including the reinforcement and concrete for the foundations, as well as the towers themselves, will be constructed with the use of helicopters to avoid the need for construction of access tracks.

Advice note

There is a hierarchy of environmental management plans, with specific management techniques to address each type of activity.

The CEMP works as an umbrella document, providing the framework under which the SEMPs are to be prepared.

The SEMPs are a site specific application of the CEMP, providing sufficient detail about the specific design for that part of the works to ensure there is certainty of environmental outcomes.

Once a SEMP has been produced, the contractor will be required to work in compliance with this, and to take this information into consideration when preparing the Erosion and Sediment Control Plan for any earthworks within an area to which the SEMP relates.

Fuel Storage and Plant

13. The Consent Holder shall ensure that:

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- 13.1 All on-site storage areas for fuel and lubricants are bunded or contained in such a manner so as to prevent the discharge of spillages of such contaminants as far as practicable.
- 13.2 No diesel storage tanks (other than those fitted to mobile plant) are located within the Water Supply Catchment.
- 13.3 Diesel storage tanks (other than those fitted to mobile plant) are bunded with the bund sized to accommodate 110% of the diesel storage volume, plus a 1% AEP 24 hour rainfall depth on the bunded area.
- 13.4 All machinery and plant is regularly maintained in such a manner so as to minimise the potential for leakage of fuels and lubricants.
- 13.5 The Consent Holder shall not undertake cleaning or routine maintenance of equipment or machinery within the Water Supply Catchment or refuelling within 10 metres of the tributaries of any watercourse on site.

Community Liaison Group (CLG)

14. Within 3 months of the date of commencement of these consents, the Consent Holder shall facilitate the creation of a CLG at its own cost and in consultation with the Manawatu-Wanganui Regional, Palmerston North City and Tararua District Councils. The following organisations and interested parties shall be invited to nominate a representative or representatives:
- 14.1 Manawatu-Wanganui Regional Council;
- 14.2 Palmerston North City Council;
- 14.3 Tararua District Council;
- 14.4 The Consent Holder;
- 14.5 Tanenuiarangi Manawatu Incorporated;

- 14.6 Te Rangimarie Marae Trustees
 - 14.7 Rangitāne o Tamaki nui a Rua;
 - 14.8 The Tararua Aokautere Guardians Inc;
 - 14.9 The Friends of the Turitea Reserve Inc;
 - 14.10 Owners of private land on which turbines are to be located;
 - 14.11 Residents of Kahuterawa and Greens Roads; and
 - 14.12 All other local residents living within 3.5km of the wind farm.
15. Each of the organisations and interested parties listed in condition 14 that wish to participate in the CLG shall be entitled to at least 1 representative on that Group.
16. The function of the CLG shall be to:
- 16.1 Discuss the performance of the Consent Holder in terms of the following matters:
 - a. Noise control including compliance with these consent conditions; and
 - b. Construction traffic impact.
 - 16.2 Consider the results of all ecological monitoring and research required in accordance with these consent conditions.
 - 16.3 Make recommendations to and receive feedback from the Consent Holder, in respect of the above matters where considered necessary and appropriate.
 - 16.4 Have input, as appropriate, via consultation with the Consent Holder with regard to the implementation of the:
 - a. NMP;

- b. CEMP; and
 - c. CTMP.
17. The Consent Holder shall develop the CLG's Terms of Reference with the Manawatu-Wanganui Regional, Palmerston North City and Tararua District Council Principal Planners. The CLG may vary its functions as it thinks fit from time to time to enable it to liaise more effectively with the community and the Consent Holder, provided this is done in consultation with the Principal Planners at each respective Council, and the variation is accepted in writing by the Consent Holder.
18. The first meeting of the CLG shall be convened at least 60 days prior to the commencement of any construction works. Thereafter, the CLG shall meet at a frequency of at least 6 monthly intervals (or at such other lesser frequency as the CLG decides), for the duration of these resource consents.

Contact and Complaints Procedure

19. The Consent Holder shall establish and publicise in the local newspaper a local telephone number and dedicated website so that members of the public have a specified point of contact during construction, operation and maintenance of the wind farm, and are able to be kept regularly informed of particular activities or events at the wind farm site.
20. The Consent Holder shall maintain a Complaints Register to record complaints from the public in respect to adverse off-site environmental impact that may arise during construction, operation and maintenance of the wind farm. This Register is to include the name and address of the complainant (if provided), the date and time of the complaint, the nature of the complaint, wind and weather at the time, activity occurring on the site at the time, details of whether the complaint was or was not able to be verified, and any remedial measures undertaken by the Consent Holder.
21. A copy of the Complaints Register shall be made available within 5 working days to the respective Council's Environmental Compliance Manager upon request. The

Consent Holder shall also forward an annual summary of the Complaints Register for the year ending 31 December to the respective Environmental Compliance Managers by 30 January the following year.

Post Construction Inspection

22. Upon completion of construction activities, the Consent Holder will invite the respective Environmental Compliance Managers to jointly inspect the site with the Consent Holder and contractor to demonstrate that all earthworks and site remediation works have been carried out in accordance with the conditions of these consents and relevant plans.

Decommissioning

23. If the wind farm ceases operation for a continuous 36-month period, or is decommissioned for any other reason, then all turbines and other above ground structures shall be removed and turbine footings covered and re-vegetated in accordance with a rehabilitation management plan prepared by a suitably qualified and experienced ecologist.
24. If, prior to the overall wind farm ceasing operation or being decommissioned in accordance with condition 23, any turbine or turbines cease operation for a continuous 24-month period, or are decommissioned, then that turbine or turbines shall be removed and the associated turbine footings covered and re-vegetated in accordance with a rehabilitation management plan prepared by a suitably qualified and experienced ecologist.

Review of Conditions

25. In accordance with section 128 of the Act, the Manawatu-Wanganui Regional, Palmerston North City and/or Tararua District Councils may within twelve months of the Crown settling any claim with Rangitaane o Manawatu under the provisions of the Treaty of Waitangi Act 1975, serve notice on the Consent Holder of its intention to review the conditions of this consent for the purpose of ensuring that this consent is consistent with the provisions of any such settled claim.

Charges

26. The Consent Holder shall pay each Council all reasonable costs and charges fixed by the Council pursuant to section 36 of the Act, in relation to any administration, monitoring and inspection relating to these consents, and charges authorised by regulations.

Advice Note

Nothing in these resource consents removes the need for the Consent Holder to apply for any approvals required under the Wildlife Act 1953. For the avoidance of doubt, this resource consent does not constitute lawful authority under the Wildlife Act.

SCHEDULE 2: Conditions relevant to Manawatu-Wanganui Regional Council Consents

Erosion and Sediment Control

General

1. The Consent Holder shall provide written notification to the Environmental Compliance Manager at least 5 working days prior to works commencing in each of the sub-catchment areas for which a SEMP has been prepared.
2. All erosion and sediment control measures shall remain the responsibility of the Consent Holder, and be installed, operated and maintained in accordance with the following hierarchy (except as otherwise required by these conditions):
 - 2.1 These consent conditions
 - 2.2 The CEMP;
 - 2.3 The relevant SEMP; and
 - 2.4 The Wellington Regional Council's Erosion and Sediment Control Guidelines for the Wellington Region (dated September 2002) (or its subsequent equivalent).
3. Road or platform pavement construction (including basecourse) works, and tower foundations may be undertaken at any time of the year. During winter (defined as the months of 1 May to 30 September inclusive) the controls on other bulk earthworks in the areas detailed in Appendix 1 to this Schedule, are as follows:
 - 3.1 No seasonal restrictions on works in Area A:
 - Realignment and widening of South Range Road
 - Realignment and widening of Water Supply Catchment Access Road

- Existing "Love Property" farm access road around the rim of Brown's Flat out to Zone 0116
- Existing site access on Part Section 276 Town of Fitzherbert (WN45A/638)

3.2 No seasonal restrictions on works in Area A (Conditional):

- Bulk filling at the Brown's Flat substation site

Condition: Foundation works to be completed in summer, and erosion and sediment control systems to be fully operational and in place prior to winter.

3.3 Approval from the Environmental Compliance Manager is required on a week by week basis for works in Area B:

- Access up to the Turitea (or "Love") Ridge
- Turitea Ridge
- Western (or "Game") Ridge in the Reserve
- Farm land generally to the east of South Range Road
- Farmland to the North West of South Range Road

3.4 Works are prohibited in Area C:

- Farmland at the northern end of the site that falls inside the Upper Turitea Catchment
- Works in Brown's Flat (other than filling works on the substation site (filling works subject to compliance with condition 3.1 above)).

4. The Consent Holder shall engage an independent and appropriately qualified person to audit the design of the erosion and sediment control measures against the CEMP and relevant SEMP, and to inspect bulk earthwork activities on an as-required basis to ensure that the sediment and erosion control measures are being

constructed and maintained in accordance with the CEMP and relevant SEMP. The Consent Holder shall implement any recommendations made by the auditor that are consistent with these consent conditions. The Consent Holder shall be responsible for the reasonable direct costs associated with this engagement.

5. Prior to the complete removal of the topsoil layer in areas of either excavation or filling, the erosion and sediment control works for the affected area shall be installed in accordance with the provisions of the relevant SEMP. The Consent Holder shall not remove or decommission any sediment ponds or perimeter controls until the associated sub-catchment area is stabilised to the satisfaction of the Environmental Compliance Manager. Removal and decommissioning of such devices must be in accordance with the relevant SEMP.

Roading

6. Structural fill required for forming roads shall, wherever practicable, be constructed of weathered rock sourced from the site.
7. All roads shall have a cut batter (where road is in cut) or constructed bund (where road is in fill) on the outside of the road, including a stabilising drainage channel sufficient to convey flow up to the 1% AEP storm along the road edge without erosion.
8. As soon as reasonably practicable after final road levels are achieved, all roads shall be covered with aggregate basecourse to provide a running surface and avoid surface and scour erosion.
9. All access roads within the wind farm, including South Range Road and the Water Catchment Access Road, shall be designed so that they drain to catchments outside the Water Supply Catchment where possible, unless:
 - 9.1 In excess of 100m² of vegetation clearance is required to provide for such drainage; or
 - 9.2 In excess of 1000m³ of earthworks is required to provide for such drainage; or

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- 9.3 The drainage (typically a swale or pipe) would need to extend more than 5m beyond the defined road corridor to reach an adjoining catchment.
10. Grit traps shall be installed as follows:
- 10.1 To intercept runoff from all earthworked areas that comprise the formed roadways and turbine platforms and immediately adjacent catchment areas that drain to the formed roadways and turbine platforms;
- 10.2 Sufficient grit traps shall be installed such that there is a maximum catchment of 1000m² per grit trap;
- 10.3 Grit traps shall be sized and maintained to provide a treatment volume that is at least 0.5% of the contributing catchment area.
11. A super silt fence shall be installed at all grit trap outfalls. The super silt fence shall have a minimum horizontal length of 10m, plus end returns of a minimum length of 2m. For locations in the base of a gully, where the effective horizontal length of fence that will be able to intercept runoff is limited by the gully side slopes, the 10m horizontal length shall be achieved by two or more shorter fences in series down the gully slope, without returns. A total horizontal length of less than 10m may be used in gully situations where the construction of the additional fence or fences in series would impinge on vegetation other than grazed pasture.
12. Silt fences shall be installed along the toe of all fills, or adjacent to any additional retaining structures constructed at the toe of any fills. Cleared vegetation may be mounded at the toe of fills provided this does not interfere with the functioning of the silt fence or its maintenance.
13. All side drains shall be constructed to provide side-channel drainage which includes erosion protection and grit trap treatment on the outfall.

Culverts

14. Stream works for culverts shall be undertaken in dry conditions as far as practicable. If flow is present the Consent Holder shall ensure that the construction activities are separated from flowing water by diverting or pumping the full flow of the streams around or through the construction works, prior to disturbance of the stream beds and installation of culverts commencing.
15. The discharge from any temporary diversion channels shall be controlled so as to prevent scour at the outlet of the channel.
16. The Consent Holder shall ensure that any fish stranded during construction works are immediately placed in the clearest flowing water adjacent to the stranding site.
17. The installation of culverts shall be undertaken in accordance with the CEMP and relevant SEMP, and in general accordance with the DoC publication "*Fish passage at Culverts*", December 1999.

Turbine Platforms

18. Turbine Platforms shall be designed to provide for erosion and sediment control measures, including those measures specific for roads, except that:
 - 18.1 At least two grit traps with super silt fences shall be provided at the Turbine Platforms;
 - 18.2 The Turbine Platform is to be bunded, with side drains; and
 - 18.3 Compaction and earthwork material standards for structural fills shall be applied to Turbine Platforms.
19. Once all turbines have been operating for at least 12 months, the Consent Holder shall rehabilitate all Turbine Platforms to the extent possible, by replanting the Turbine Platforms. The plant species to be used for such planting shall include grass and/or toetoe, with follow-up planting of woody species on the margins of

the Turbine Platforms beyond working areas once an initial cover has been established.

Substation Platforms, Laydown Areas and Stockpiles

20. A sediment control pond shall be provided during the construction of the substation platform at Browns Flat, in accordance with the relevant SEMP.
21. No topsoil stockpiles shall be located within the Water Supply Catchment.
22. Any topsoil stockpile that is intended to remain in situ for more than 4 consecutive weeks shall have perimeter silt fences and be hydroseeded.
23. All topsoil stockpiles shall be bunded on the uphill side to divert clean water runoff away from the stockpile.
24. Processed inert materials (e.g. crushed rock) may be stockpiled on Turbine Platforms that do not drain in to the Water Supply Catchment.

Spoil Disposal Sites

25. All spoil disposal sites shall be located to ensure that:
 - 25.1 The uphill boundary is located as close to the ridgeline as possible to reduce upstream catchment size;
 - 25.2 Suitable locations for clean-water cut-off drains can be provided;
 - 25.3 The maximum possible fill volume to surface area ratio is achieved;
 - 25.4 Any indigenous vegetation clearance is minimised;
 - 25.5 They are a minimum of 25m from a permanent watercourse;
 - 25.6 A sediment pond can be located to treat all run-off from the site; and

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- 25.7 There is all weather vehicle (truck and 4x4 utility vehicle) access to sediment ponds for inspection and maintenance purposes.
26. All spoil disposal sites shall be designed, constructed and managed in accordance with the following:
- 26.1 The toe bund shall be structural and constructed of weathered rock;
- 26.2 The amount of surface area within the spoil site that is exposed at any one time shall be minimised, and limited to a maximum of 3ha per sediment pond;
- 26.3 Exposed areas shall be stabilised to the greatest extent practicable at the end of each day, and temporarily covered if possible prior to any significant storm event;
- 26.4 A 3% sediment pond (or ponds) (being 3m³ volume for every 100m² of catchment) shall be constructed to collect and treat run-off from each site;
- 26.5 All sediment ponds shall be constructed to provide for retrofitting of flocculation if needed;
- 26.6 Flocculation shall be provided for each spoil site sediment pond where:
- The soils to be placed at the site do not settle to at least 80% removal in 30 minutes and at least 95% removal in 24 hours; and
 - Laboratory testing shows that flocculation can result in at least 80% removal in 30 minutes and at least 95% removal in 24 hours;
- 26.7 Compliance with condition 26.6 is to be established by sampling and testing of representative samples of the soils to be placed, both prior to preparation of the SEMP, and during placement in the spoil area;

- 26.8 A clean water diversion shall be constructed around each site that is capable of diverting the 1% AEP storm event around the site without erosion;
- 26.9 Each spoil site shall be stabilised and grassed over or re-vegetated, as soon as practicable after it has been fully utilised, in order to prevent scour and avoid sediment being washed into adjacent watercourses. Stabilisation may be staged, and stabilised areas diverted to a clean water diversion, to maintain a suitably small working catchment area; and
- 26.10 For any spoil disposal sites within the Kahuterawa catchment, stormwater runoff discharged from the sediment pond or external pond batters shall, in addition to any other treatment measures, pass through at least 10m of rank grass buffer before reaching an ephemeral watercourse.

Aquatic Ecology

Monitoring

27. The Consent Holder shall engage a suitably qualified and experienced ecologist to prepare a monitoring programme to measure the effects of construction activities on the Turitea Stream, Kahuterawa Stream, Otangane Stream, Tainui Stream and Southern Matarua Creek. The monitoring programme shall be submitted to the Manawatu-Wanganui Regional Council's Environmental Compliance Manager for review, acting in a technical certification capacity, prior to the commencement of any construction works. A response should be provided within 30 working days of receipt. Construction activities must not commence until written certification has been obtained.
28. The monitoring programme shall include a requirement to obtain pre-construction data for a period of not less than 6 months on water quality and in-stream community structure (including the presence, if any, of *Namalycastis tiriteae*) in order to establish baseline data. The monitoring programme shall be reviewed 2 years after the completion of all construction works, and the Consent Holder shall engage a suitably qualified and experienced ecologist to determine the need to

continue the monitoring programme at that time. The ecologist shall make this determination in consultation with the Manawatu-Wanganui Regional Council's Environmental Compliance Manager.

29. The monitoring programme shall include the following matters:

- 29.1 Identification of a selection of sampling sites (which add to the established Palmerston North City Council monitoring sites identified in Appendix 2 to this Schedule);
- 29.2 Detail of the parameters to be monitored (including water quality, sediment transport and deposition, and instream community structure, including *Namalycastis tiriteae*);
- 29.3 A requirement for diurnal monitoring of pH, dissolved oxygen and water temperature during critical phases of construction within selected watercourses;
- 29.4 A requirement that suspended solids and settled sediment be measured using Quorer sampling techniques;
- 29.5 Nomination of thresholds for parameters that are not to be exceeded and are to be monitored, and establishing the required response in the event of non-compliance;
- 29.6 Details (for example, location, recording method, type, accuracy) of the on-site weather stations that are to be installed and utilised as part of this monitoring programme;
- 29.7 Requirements for monitoring vegetation and topsoil storage sites; and
- 29.8 An outline of the monitoring strategy to be followed in response to specified rainfall/meteorological events.

Adaptive Management Response to Findings of Aquatic Ecology Monitoring

30. The Consent Holder shall engage a suitably qualified and experienced ecologist to prepare an AEMRP which specifies responses to the findings of the monitoring to be undertaken in accordance with condition 27, as developed and agreed between the Consent Holder and the Manawatu-Wanganui Regional Council's Compliance Manager. The AEMRP shall be submitted to the Manawatu-Wanganui Regional Council's Environmental Compliance Manager for review, acting in a technical certification capacity, within 3 months of the completion of all construction works. A response should be provided within 30 working days of receipt.

Terrestrial Ecology

General

31. The Consent Holder shall engage a suitably qualified and experienced ecologist to advise on the final detailed design for siting of the wind farm infrastructure, including the final placement of turbines and associated infrastructure within the turbine zones, and transmission, roading, erosion and sediment control and other infrastructure across the site. In undertaking the final detailed design, the Consent Holder shall, in addition to the advice from the ecologist, also take into account:
- 31.1 The Rehabilitation/Revegetation Plan prepared in accordance with condition 33.
 - 31.2 The Weed Monitoring and Control Plan and prepared in accordance with condition 41.
 - 31.3 The findings of the surveys undertaken in accordance with conditions 45, 52 and 60.
 - 31.4 The relevant Transpower Regulations, including (but not limited to) *Electricity (Hazards from Trees) Regulations (2003)* and the *New Zealand Code of Practice for Electrical Safe Distances*.

32. The trimming of vegetation post-construction shall be limited to that required for mitigation of edge effects (as outlined in the Rehabilitation/Revegetation Plan prepared in accordance with these consent conditions), and the maintenance of road access.

Rehabilitation/Revegetation Plan

33. The Consent Holder shall engage a suitably qualified and experienced ecologist to prepare a Rehabilitation/Revegetation Plan (in consultation with Palmerston North City Council's Principal Planner, regarding those parts of the plan for Browns Flat) for those areas disturbed by the construction of roads, crane working platforms, and turbine platforms, where possible. For the avoidance of doubt, the Rehabilitation/Revegetation Plan will address the rehabilitation of the two sections of the Water Catchment Access road that will become redundant once the two new realignments have been put in place. The revegetation undertaken shall use a combination of indigenous planting and management of natural revegetation (specifically the control of wildling conifers and other invasive weeds).
34. The Rehabilitation/Revegetation Plan must also require the following:
- 34.1 If turbines from both the Northern and Southern Turbine Zones are constructed, the rehabilitation/revegetation of at least 10 hectares at Browns Flat;
- 34.2 If only turbines from the Southern Turbine Zones are constructed, the rehabilitation/revegetation of at least 9.5 hectares at Browns Flat; or
- 34.3 If only turbines from the Northern Turbine Zones are constructed, the rehabilitation/revegetation of at least 1 hectare at Browns Flat.
35. Each of the figures provided in condition 34 includes the provision of 0.5ha of rehabilitation as mitigation for vegetation clearance associated with the construction of the transmission line. If no transmission line is constructed, the relevant area for rehabilitation/revegetation at Browns Flat shall be reduced by 0.5ha.

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36. The Rehabilitation/Revegetation Plan shall include details of the following matters:
- 36.1 The aims of the revegetation programme.
- 36.2 The areas to be treated for each of the options set out in conditions 34.1, 34.2 and 34.3 which are to be determined in consultation with the Palmerston North City Council.
- 36.3 The types of techniques to be used and the places they will be used.
- 36.4 A requirement for indigenous species selection and eco-sourcing (i.e. sourcing local seeds/plants for local use preferably from within the Reserve, or from the wider Manawatu Gorge South Ecological District or from similar altitudes in equivalent LENZ Level 2 environments, if material from the Reserve is not available) in consultation with local iwi, to ensure that the revegetation uses a combination of indigenous planting and management of natural revegetation.
- 36.5 Details of the monitoring and maintenance techniques to be adopted, including weed control, pest control, infill planting, and operational timing.
- 36.6 A plan of the existing wetlands within Brown's Flat.
37. The Consent Holder shall undertake all rehabilitation/revegetation works in accordance with the Rehabilitation/Revegetation Plan. The Rehabilitation/Revegetation Plan shall provide for:
- 37.1 The rehabilitation of construction areas, through the rapid establishment of cover on open sites not required for operation of the wind farm. This will be achieved using techniques such as hydro-seeding, planting, and direct transfer. Non-invasive exotic grasses may be used to establish rapid initial cover, followed by planting of locally-sourced indigenous species matched to the characteristics of the sites being rehabilitated. In the Turitea Reserve and on land owned by the Department of Conservation, the use of exotic species shall be restricted to the grass browntop (*Agrostis capillaris*), and if used for

hydro-seeding or direct sowing, it shall preferably be mixed with seeds of locally-sourced native species. In pasture areas, revegetation will be undertaken using a combination of appropriate pastoral grasses.

- 37.2 The development of an operational trial using locally-sourced indigenous species for indigenous revegetation along low-gradient streams at Browns Flat, the implementation of an operational trial of up to 1ha over a 3 year period, with the reporting on trial results to be provided to PNCC and tangata whenua. Once the results of the trial are available, and based on the results of the trial, the Rehabilitation/Revegetation Plan will be amended to also address the riparian revegetation of riparian margins on low gradient streams at Browns Flat, starting at the lowest part of the stream network. The width of the planted riparian margins may vary (down to 5 metres) subject to terrain, and should include clusters of larger tree species.
38. The Rehabilitation/Revegetation Plan shall be submitted to the Manawatu-Wanganui Regional Council's Environmental Compliance Manager for review, acting in a technical certification capacity, no later than 6 months prior to the commencement of any construction works. A response should be provided within 30 working days of receipt. Construction activities must not commence until written certification has been obtained.
39. The Consent Holder shall submit an annual report to the Manawatu-Wanganui Regional Council's Environmental Compliance Manager by 1 July each year for 10 years following the commencement of construction works, outlining the results of the revegetation works and reporting on compliance with the Rehabilitation/Revegetation Plan.

Weed Monitoring and Control

40. The Consent Holder shall undertake weed monitoring and control over the areas disturbed by construction and those areas adjacent to the disturbed areas that may, as a result of construction, be adversely affected by weeds.

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41. For the purposes of condition 40, the Consent Holder shall engage a suitably qualified and experienced ecologist to prepare a Weed Monitoring and Control Plan that shall include details of the following matters:
- 41.1 The species to be monitored and controlled (by reference to their status in relevant plans such as the Regional Plant Pest Management Strategy), including provision to review those species should a new species be identified within the weed monitoring and control areas (identified above) once construction has commenced. The list of weeds to be monitored is to include ecologically-threatening species and shall also take account weeds of concern to the Manawatu-Wanganui Regional, Palmerston North City and Tararua District Councils, and that are listed in the National Pest Plant Accord.
- 41.2 The frequency of weed monitoring inspections across the entire wind farm layout, and adjacent habitats that could be affected, to be undertaken by a suitably qualified and experienced person or persons. These shall occur at 3-monthly intervals from the start of construction until 1 year after the completion of construction. At the 1 year post construction anniversary, weed monitoring shall be undertaken annually, or more frequently as required.
- 41.3 The specification of control intensity requirements and control measures for particular types of weeds.
- 41.4 Details of weed hygiene controls, including equipment wash-down sites and facilities, the sources and hygiene requirements for quarried material, and preventative measures to prevent weeds being transported to and from the site from and to other locations.
42. The Weed Monitoring and Control Plan shall be integrated with the Rehabilitation/Revegetation Plan to the extent that both plans relate to the same areas.

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43. The Weed Monitoring and Control Plan shall be submitted to the Manawatu-Wanganui Regional Council's Environmental Compliance Manager for review, acting in a technical certification capacity, no later than 6 months prior to the commencement of any construction works. A response should be provided within 30 working days of receipt. Construction activities must not commence until written certification has been obtained.
44. The Consent Holder shall undertake the weed monitoring and control in accordance with the Weed Monitoring and Control Plan and shall submit an annual report to the Manawatu-Wanganui Regional Council's Environmental Compliance Manager by 1 July each year for 10 years following the commencement of construction works, outlining the results of the weed monitoring and control works and reporting on compliance with the Weed Monitoring and Control Plan.

Pre-construction Avian and Bat Utilisation Surveys

45. The Consent Holder shall engage suitably qualified and experienced avian and bat experts to undertake a Pre-construction Avian Survey and Pre-construction Bat Utilisation Survey.
46. A site plan for the area to be covered by the survey, the survey methodologies and reporting mechanisms for the Pre-construction Avian Survey and Pre-construction Bat Utilisation Surveys shall be developed in consultation with the Department of Conservation and shall be submitted to the Manawatu-Wanganui Regional Council's Environmental Compliance Manager for review, acting in a technical certification capacity, within 1 year of the date of commencement of these consents. A response should be provided within 30 working days of receipt. Construction activities must not commence until written certification has been obtained.
47. The surveys must each be undertaken for a minimum of 4 consecutive seasons over 1 year (including a period in late February-early March) and shall as a minimum:

- 47.1 Document seasonal species presence and relative abundance;

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- 47.2 Record seasonal habitat use patterns and flight pathways;
- 47.3 Record seasonal variation for indigenous species that the avian and bat experts determine are at particular risk from wind turbines; and
- 47.4 Analyse relative risk for bird species.
48. If no bats are identified as present in the survey area, the Consent Holder shall engage a suitably qualified and experienced bat expert to determine, in consultation with the Department of Conservation, a procedure to be followed in the event bats are later identified during construction.
49. The results of the Pre-construction Avian and Bat Utilisation Surveys shall be provided in writing to the Manawatu-Wanganui Regional Council's Environmental Compliance Manager and the Department of Conservation within 20 working days of the completion of the surveys.
50. Final reports detailing the outcomes of the Pre-construction Avian and Bat Utilisation Surveys shall also be provided to the Manawatu-Wanganui Regional Council's Environmental Compliance Manager and the Department of Conservation within 2 months of completion of the surveys. These final reports shall identify methods to avoid, remedy, or mitigate any adverse effects of the wind farm on threatened avifauna species and/or threatened bat species.
51. For the purposes of section 125 of the Act, the commencement of the survey under condition 45 shall give effect to these resource consents.

Pre-construction Herpetofauna and Powelliphanta Snail Surveys

52. The Consent Holder shall engage a suitably qualified and experienced ecologist (or ecologists) to undertake pre-construction surveys for herpetofauna and Powelliphanta snails within the areas proposed to be disturbed by construction activities.

53. The survey methodologies and reporting mechanisms for the pre-construction herpetofauna and Powelliphanta snails surveys shall be developed in consultation with the Department of Conservation and shall be submitted to the Manawatu-Wanganui Regional Council's Environmental Compliance Manager for review, acting in a technical certification capacity, within 1 year of the date of commencement of these consents. A response should be provided within 30 working days of receipt. Construction activities must not commence until written certification has been obtained.
54. The results of the herpetofauna and Powelliphanta snail surveys shall be provided in writing to the Manawatu-Wanganui Regional Council's Environmental Compliance Manager and the Department of Conservation within 20 working days of the completion of the surveys. Final reports detailing the outcomes of the surveys shall also be provided to the Manawatu-Wanganui Regional Council's Environmental Compliance Manager and the Department of Conservation within 2 months of the completion of the surveys.
55. If any threatened herpetofauna species or Powelliphanta snails are identified during the surveys as being present within the surveyed area, the Consent Holder shall develop a Protection Plan for such species in consultation with the Department of Conservation. The Protection Plan shall identify methods to avoid, remedy, and mitigate any adverse effects of the wind farm on threatened herpetofauna species and/or Powelliphanta snails and shall include details of the following matters:
- 55.1 ongoing monitoring and population assessment including distribution and habitat description;
 - 55.2 identification and development of options for species protection and enhancement such as:
 - a. translocation; and
 - b. in-situ protection (including options such as enhanced pest control and amendment to wind farm design and operation).

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56. The Protection Plan (if required in accordance with condition 55) shall be submitted to the Manawatu-Wanganui Regional Council's Environmental Compliance Manager for review, acting in a technical certification capacity, no later than 2 months prior to the commencement of any construction works. A response should be provided within 30 working days of receipt. Construction activities must not commence until written certification has been obtained.
57. The Consent Holder shall undertake all works in accordance with the Protection Plan and shall submit an annual report to the Manawatu-Wanganui Regional Council's Environmental Compliance Manager and the Department of Conservation by 1 July each year for 10 years following the commencement of construction works, outlining the results of the protection works and reporting on compliance with the Protection Plan.
58. If no threatened herpetofauna species or Powelliphanta snails are identified as being present in the survey area, the Consent Holder shall, in consultation with the Department of Conservation, develop a procedure to be followed in the event that threatened herpetofauna species or Powelliphanta snails are found during construction. The procedure shall identify methods to avoid, remedy, and mitigate any adverse effects of the wind farm on the threatened herpetofauna species or Powelliphanta snails.
59. The procedure shall be submitted to the Manawatu-Wanganui Regional Council's Environmental Compliance Manager for review, acting in a technical certification capacity, no later than 2 months prior to commencement of any construction works. A response should be provided within 30 working days of receipt. Construction activities must not commence until written certification has been obtained.

Post Construction Avian and Bat Strike Monitoring

60. The Consent Holder shall engage suitably qualified and experienced avian and bat experts to undertake Post-Construction Avian and Bat Strike monitoring for a minimum of 12 consecutive seasons (3 years) after commissioning of the wind farm.

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61. The monitoring methodology and reporting mechanisms shall be developed in consultation with the Department of Conservation and shall as a minimum set out:
- 61.1 the framework of the collision fatality monitoring;
 - 61.2 the procedures for recording observed avoidance behaviour; and
 - 61.3 any other measures required to accurately assess the strike/collision effects of the wind farm on avifauna and bats.
62. The outcomes of the Pre-construction Avian and Bat Utilisation Studies undertaken in accordance with condition 45 shall be taken into account when identifying which species, if any, require further post-construction monitoring.
63. The monitoring and reporting mechanisms for the Post-Construction Avian and Bat monitoring programmes shall be submitted to the Manawatu-Wanganui Regional Council's Environmental Compliance Manager for review, acting in a technical certification capacity, no later than 2 months after the commencement of any construction works. A response should be provided within 30 working days of receipt.
64. The results of the Post-Construction Avian and Bat Strike monitoring shall be provided in writing annually to the Manawatu-Wanganui Regional Council's Environmental Compliance Manager and the Department of Conservation for a minimum of 12 consecutive seasons (3 years) after commissioning of the wind farm.
65. A final report shall also be provided to the Manawatu-Wanganui Regional Council's Environmental Compliance Manager and the Department of Conservation within 3 months of the completion of the monitoring period. This final report shall include recommendations as to any measures that should be undertaken to avoid, remedy, or mitigate any adverse effects of the wind farm on threatened avifauna species and/or threatened bat species.

Review of ecological conditions

66. In accordance with section 128 of the Act, the Manawatu-Wanganui Regional Council may:

66.1 within 6 months of every 2 year interval from the date of commencement of this consent, serve notice on the Consent Holder of its intention to review the ecological conditions of this consent for any of the following purposes:

- a. To consider adverse effects of the wind farm on threatened avifauna species, threatened bat species and/or threatened herpetofauna species that may arise from the exercise of the consent and which are appropriate to deal with at a later stage;
- b. To consider adverse effects of individual turbines on threatened avifauna species, any threatened bat species and/or any threatened herpetofauna species and whether there are any particular factors influencing the adverse effects caused by individual turbines; and
- c. To require the Consent Holder to adopt measures to avoid, remedy or mitigate such adverse effects.

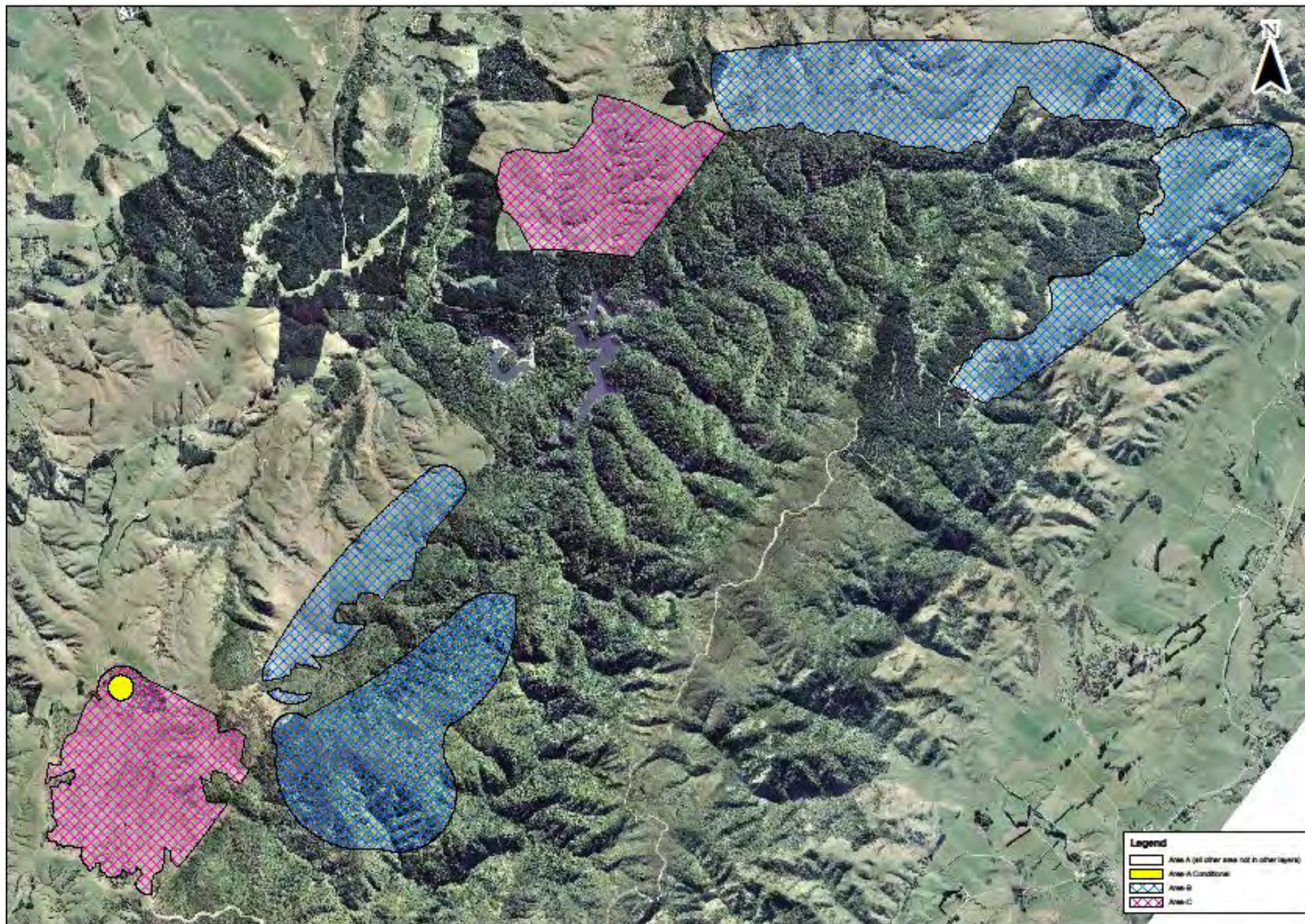
66.2 within 30 days of receiving an annual or final report in accordance with conditions 50, 54 and 65, serve notice on the Consent Holder of its intention to review the conditions of this consent for the purpose of making any amendments to these conditions which the reports recommend may be required to avoid, remedy or mitigate an identified adverse effect on threatened avifauna species and/or any threatened bat species.

Dust Control

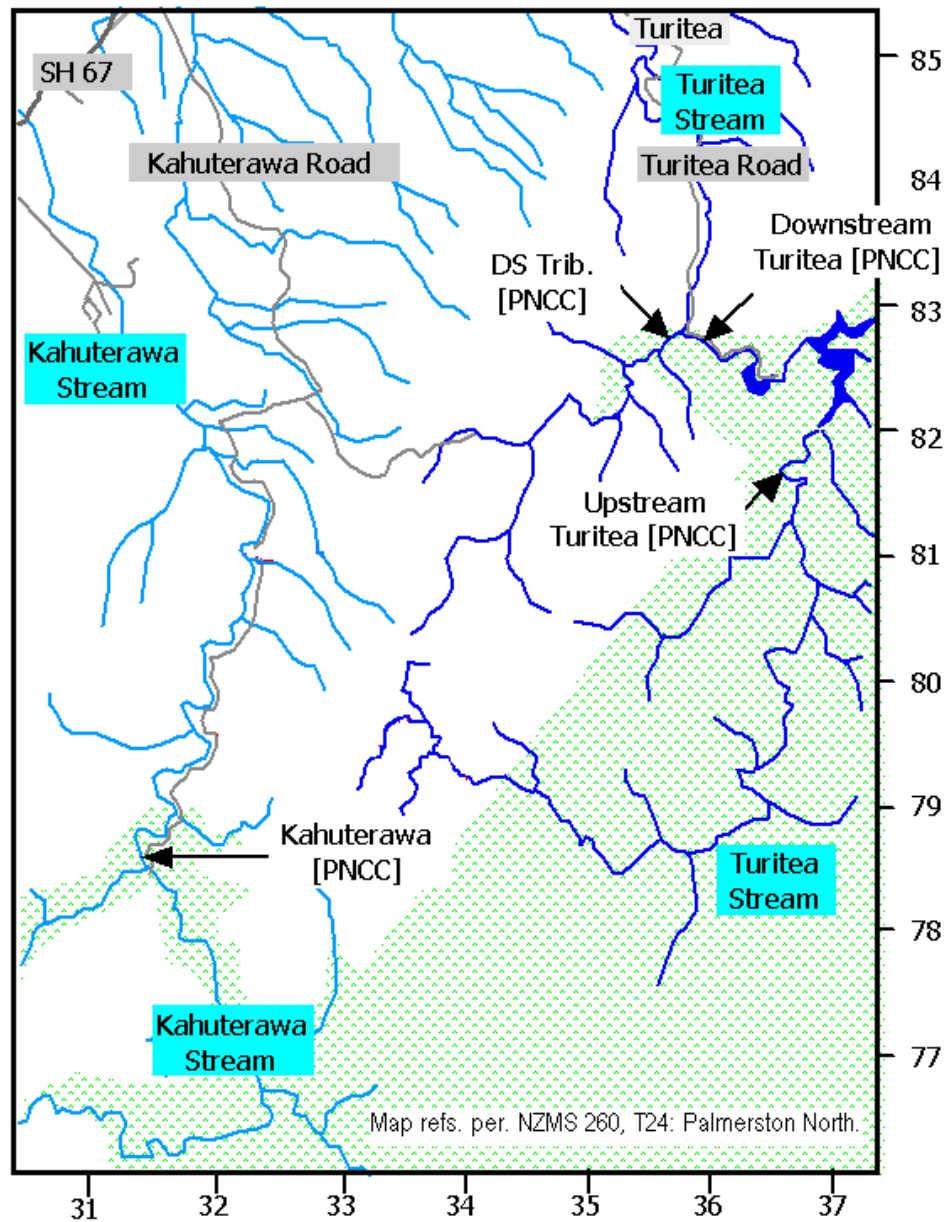
67. The Consent Holder shall ensure that the construction, operation and maintenance activities are managed in a manner to ensure that there are no dust emissions occurring beyond the boundary of the site that are objectionable or offensive. Measures for control may include, but are not limited to, the application of water to

- surfaces that are exposed or excessively dry, and covering an exposed area with a coating of geotextile, grass and/or mulch.
68. If offensive or objectionable dust emissions do occur beyond the site boundaries, the dust-causing activity shall cease immediately and shall not recommence until appropriate measures have been put in place to prevent recurrence of a similar event.
69. Should objectionable or offensive dust emissions occur, the Consent Holder shall provide a written report to the Environmental Compliance Manager within 5 working days of the Consent Holder being made aware of such emissions. The report shall specify:
- 69.1 The severity of the event;
 - 69.2 The cause or likely cause of the event and any factors that influenced its severity;
 - 69.3 The nature and timing of any measures implemented by the Consent Holder to avoid, remedy or mitigate any adverse effects; and
 - 69.4 The steps to be taken in future to prevent recurrence of similar events.
70. The CEMP shall detail the measures to be implemented to suppress dust caused by the movement of construction vehicles on Greens Road and Pahiatua-Aokautere Road during the construction period.

Appendix 1: Winter Works “Restriction” Areas



Appendix 2: Palmerston North City Council Water Monitoring Sample Sites



SCHEDULE 3: Conditions relevant to Palmerston North City Council and Tararua District Council Consents

General

1. All external and visible parts of the turbines including towers, nacelles and turbine rotor blades shall be finished in a light grey colour and in low reflectivity finishes.
2. The Consent Holder shall maintain the turbines in good condition at all times and shall undertake appropriate regular servicing in accordance with industry practice.
3. No part of any turbine shall be operated beyond the boundary of the site, except where the adjoining landowner has provided their written approval to the proposal.
4. Minor alterations to these conditions may be proposed by the Consent Holder to the Environmental Compliance Manager at each respective Council to accommodate the particular turbine technology used or to comply with other conditions of consent. Such alterations shall be notified in writing to the respective Environmental Compliance Managers and shall not be materially different from the proposal described in the application and supplementary documents as outlined in condition 1 of Schedule 1.
5. Turbines shall be no more than 125m in height (as measured from the existing ground level to the vertically extended blade tip).
6. The Consent Holder shall, at least 6 months prior to the scheduled commencement of construction, provide CAA and Airways New Zealand with the geographical co-ordinates of the sites at which turbines are to be constructed.
7. The Consent Holder shall comply with the conditions set out by the CAA in the "Determination of Hazard in Navigable Airspace" for the Turitea Wind Farm (dated 14 November 2008, or any subsequent replacement).

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8. Upon commissioning of the wind farm the Consent Holder shall provide a set of “as built” plans to the Environmental Compliance Manager at each respective Council, and the CAA, that identifies the final location of each turbine, the substations, the operations and maintenance buildings, the transmission lines, the permanent wind monitoring masts and other permanent features of the wind farm that have been constructed in accordance with this consent.

Cultural/Archaeological Matters

Archaeological and Cultural Site Protocol

9. The Consent Holder shall develop a protocol as part of the CEMP to manage and protect the integrity of known and unknown archaeological and cultural sites from damage or loss. Details of the protocol shall be submitted to the Principal Planners at each respective Council prior to any bulk earthworks being undertaken. The protocol shall clearly set out the steps to take in accordance with this consent should any prehistoric (Maori) or historic archaeological site or sub-surface deposits be found at any time.

Accidental Discovery Protocols

10. If Taonga (treasured or prized possessions, including Maori artefacts) or archaeological sites are discovered in any area being earth-worked, the Consent Holder shall cease work within a 100m radius of the discovery immediately and contact local iwi, the New Zealand Historic Places Trust and the relevant Environmental Compliance Manager(s). Works shall not recommence in that area until a site inspection is carried out by iwi representatives, relevant Council staff and staff of the Historic Places Trust (if they consider it necessary); the appropriate action has been carried out to remove the Taonga and record the site, or alternative action has been taken; and approval to continue work is given by the relevant Environmental Compliance Manager(s). The site inspection shall occur within 3 working days of the discovery being made.

Excavation of Koiwi Tangata Remains

11. If during construction activities, any Koiwi (skeletal remains) or similar material are uncovered, works are to cease within a 100m radius of the discovery immediately, and the Consent Holder shall notify the New Zealand Police, local iwi, the New Zealand Historic Places Trust and the relevant Environmental Compliance Manager(s). Works shall not recommence in that area until a site inspection is carried out by iwi representatives, relevant Council staff, and staff from the Historic Places Trust and the New Zealand Police (if they consider it necessary); the appropriate ceremony has been conducted by iwi (if necessary); the materials discovered have been removed by the iwi responsible for the tikanga appropriate to their removal and preservation or re-interment, or alternative action (e.g. works are relocated) has been taken; and approval to continue work is given by the relevant Environmental Compliance Manager(s).

Area of Local Significance

12. In the event that earthworks are undertaken within sites that local iwi have indicated to the Consent Holder in writing are of significance, the Consent Holder shall invite a tangata whenua representative on site to monitor the works.
13. The historic sites situated within the site, as identified in the Archaeological Assessment included as Appendix G of the application documents, shall be temporarily fenced off for the duration of site works to prevent accidental damage during construction.

*Acoustic Matters**Construction Noise*

14. Noise from all construction work shall be measured and assessed in accordance with NZS6803, and shall comply with the noise limits for long-term duration set out in that Standard.

15. A CNMP shall be prepared prior to the commencement of any construction works and shall be properly implemented at all times. The CNMP shall be generally in accordance with section 8 and the relevant annexures of NZS6803, which detail the relevant types of construction to which the CNMP is to apply, and procedures that will be carried out to ensure compliance with that Standard.
16. The CNMP shall be prepared by an appropriately qualified and experienced acoustic consultant, and shall be submitted to the Environmental Compliance Managers of each respective Council for review, acting in a technical certification capacity. A response should be provided within 30 working days of receipt. Construction activities must not commence until written certification has been obtained.

Operational Noise Levels (Non Turbine Related)

17. Noise from all other activities on the site (other than wind turbine generator operation, and construction activities including concrete manufacture) shall not exceed the following:

7.00am to 10.00pm 50dB L_{Aeq}

10.00pm to 7.00am 40dB L_{Aeq}

10.00pm to 7.00am 70dB L_{Amax}

when measured at or within the boundary of any site other than the wind farm site. For the purpose of clarity, this condition does not apply to dwellings in respect of which the Consent Holder has reached agreement with the landowner. The noise shall be measured in accordance with NZS6801 and assessed in accordance with NZS6802.

Operational Noise Levels (Turbines)

18. The turbines shall be designed, constructed, operated and maintained so that wind farm sound levels shall comply with NZS6808 except where stated otherwise in the following conditions:.

- 18.1 The wind farm sound levels ($L_{A90(10 \text{ min})}$) shall not exceed the background sound level (as described by the NMP discussed in condition 23.1 below) by more than 5dB, or a level of 40dB $L_{A90(10 \text{ min})}$, whichever is the greater except for times when the wind speed and background noise levels are such as to trigger a secondary noise limit, as set out in condition 18.2 below;
- 18.2 When the wind farm speed is 6m/s or lower when measured within the Northern Turbine Zones (for residences in proximity to those turbines) or Southern Turbine Zones (for residences in proximity to those turbines), a secondary noise limit shall apply under which the wind farm sound levels ($L_{A90(10 \text{ min})}$) shall not exceed the background sound level (as described by the NMP discussed in 23.1 below) by more than 5dB, or a level of 35dB $L_{A90(10 \text{ min})}$, whichever is the greater;
- 18.3 This secondary noise limit shall apply only between the hours of 10pm to 7am.
- 19 Wind farm sound shall be measured and assessed in accordance with NZS 6808 and these conditions of consent within the:
- 19.1 notional boundary of any residential dwelling either existing or consented at the date of this consent (excluding residential dwellings on properties on which turbines are located or where the owner has provided written consent to the wind farm); or
- 19.2 property boundary of any residentially zoned site on which a residential dwelling is able to be constructed as a permitted activity in accordance with the relevant plan rules, as at the date of this consent.
- 20 For the avoidance of doubt and for the purposes of compliance with condition 18, the "Reference Test method" shall be adopted for testing whether the wind farm has tonal special audible characteristics, in accordance with Appendix B of NZS 6808.

- 21 The wind farm shall be designed with wind turbines that minimise noise emissions and that do not generate special audible characteristics.

NMP

- 22 A NMP shall be submitted to the Palmerston North City Council and Tararua District Council Principal Planners for review, acting in a technical certification capacity, prior to commencement of operation of the wind farm. A response should be provided within 30 working days of receipt.
- 23 The NMP shall be prepared by the Consent Holder in conjunction with an appropriately qualified and experienced acoustic consultant, and shall, as a minimum, include:
- 23.1 An assessment of background sound levels which shall form the basis of the noise limits described in condition 18;
- 23.2 Wind turbine selection, having regard to the sound power level predictions obtained in accordance with section 6.2, and the special audible characteristics in clause 5.4.1 of NZS6808;
- 23.3 Any further procedures necessary for ensuring compliance with the noise limits in condition 18 in addition to those already provided in these consents, including noise compliance testing, methods for addressing non-compliance, and contacts and complaints procedures;
- 23.4 Procedures for addressing turbine malfunctions that cause material noise effects beyond typical operational noise;
- 23.5 Any further requirements for post construction noise monitoring and assessment in addition to those already provided in these consents; and
- 23.6 Provisions regarding review and updating of the NMP.

- 24 The Consent Holder shall operate the wind farm and act in compliance with the NMP at all times.

Noise Monitoring Costs

- 25 The Consent Holder shall pay all reasonable costs associated with the compliance testing or assessment undertaken in accordance with these conditions.

Pre-Instalment Assessment

Acoustic Emissions Report

- 26 Prior to commencement of operation of the wind farm, the Consent Holder shall provide Palmerston North City Council's Principal Planner with an Acoustic Emissions Report in accordance with NZS6808 which details the sound power level of the selected turbines, and confirms the selected turbines are not expected to have special audible characteristics.

Noise Prediction Report

- 27 Prior to commencement of operation of the wind farm, the Consent Holder shall provide Palmerston North City Council's Principal Planner with a Noise Prediction Report in accordance with NZS6808 (and in particular sections 8.1, 8.2 and 8.4.2). The Noise Prediction Report shall:
- 27.1 be based on the sound power levels for the selected turbines, and demonstrate that the limits in condition 18 can be complied with;
 - 27.2 identify the background sound levels and noise limits in accordance with condition 18;
 - 27.3 include the finalised 35dBA contour for the project, pertaining to the wind speed at which the highest noise level is emitted from the selected turbines;
 - 27.4 be detailed and accurate enough to determine (as shown on a map attached to the Noise Prediction Report) in the event that compliance with the limits in

condition 18 cannot be achieved with unrestricted operation, which wind turbines will be de-rated, by how much and under what circumstances; and

- 27.5 outline the control systems to be put in place so that the wind farm operates in accordance with the constraints in condition 27.4 from commissioning if necessary.

Background Noise Surveys

- 28 The Consent Holder shall engage an appropriately qualified and experienced acoustic consultant to undertake pre-installation background noise surveys at positions identified by the Consent Holder in consultation with the Palmerston North City and Tararua District Councils in addition to those undertaken for the Resource Consent application. The background noise surveys should include separately correlated background sound levels for the predominant north-westerly and south-easterly wind directions for both daytime and night-time periods (night-time as defined in condition 18.3). The surveys shall be undertaken, and results assessed, in accordance with sections 7 and 8.2 of NZS6808.

Noise monitoring during start up

- 29 The Consent Holder shall arrange for a minimum of 3 continuous NMT to be installed at appropriate locations around the wind farm site, and moved as different turbines (or groups of turbines) become operational. The NMTs shall be installed from when the first wind turbine (or group of turbines) become operational, until 3 months after the last turbine (or group of turbines) become operational or until such time as an appropriately qualified and experienced acoustic consultant engaged by the Consent Holder determines that sufficient representative monitoring has been undertaken of all contributing turbines, operating in representative wind speeds, directions and times of day/night.
- 30 The NMT shall be capable of carrying out audio recordings as necessary.

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- 31 The NMT shall also be capable of producing a “regression curve” based on a rolling 10-day block of data, which is suitable for comparison with the noise limit regression curve in accordance with the procedures specified in NZS6808.
- 32 The Consent Holder shall ensure that after the first 2 weeks of monitoring, the rolling “regression curve” is emailed to the Palmerston North City Council’s Environmental Compliance Manager on a weekly basis for the remainder of the monitoring period, and after that, provided as requested by the local authority.
- 33 The appropriate number and locations for the NMT, and weather stations necessary for undertaking the necessary assessment, shall be determined as required throughout the monitoring period, by an appropriately qualified and experienced acoustic consultant engaged by the Consent Holder in consultation with the Environmental Compliance Manager of Palmerston North City Council or Tararua District Council as appropriate. In making this determination, the acoustic consultant shall in particular have regard to the number and location of contributing turbines currently operational and/or about to become operational, and their proximity to any residential properties.
- 34 The Consent Holder shall submit a monthly report to the Palmerston North City Council’s Environmental Compliance Manager outlining the results of the noise monitoring undertaken in accordance with condition 29, and reporting on compliance with the noise consent conditions. The first of these reports shall be provided 1 month after the first wind turbine (or group of turbines) becomes operational, and the last of these reports provided within 20 working days of the last turbine (or group of turbines) becoming operational.

Operational noise monitoring and assessment

Monitoring to determine compliance with NZS6808

- 35 If requested by the Environmental Compliance Manager of either the Palmerston North City or Tararua District Council, the Consent Holder shall undertake additional post-installation noise monitoring at any location, at any wind speed and direction,

or time of day, for the purpose of determining compliance with the noise consent conditions or investigating complaints.

- 36 Any post-installation noise monitoring required in accordance with condition 35 shall be undertaken by an appropriately qualified and experienced acoustic consultant, and in accordance with the requirements of NZS6808. The results shall be submitted to the Environmental Compliance Manager of the appropriate Council within 10 working days after completion of the testing.
- 37 Should either the Palmerston North City or Tararua District Councils choose to undertake its own noise monitoring for whatever reason then the Consent Holder shall provide the wind data required to analyse the results in accordance with the noise consent conditions.

Assessment with respect to complaints regarding unreasonable noise

- 38 If requested by the Environmental Compliance Manager of either the Palmerston North City or Tararua District Council, the Consent Holder shall engage an appropriately qualified and experienced acoustic consultant, who together with the relevant Council's nominated representative, shall undertake an assessment in similar meteorological conditions to those existing at the time of any complaint, to determine whether noise emanating from the wind farm is unreasonable in terms of section 16 of the Act. For the avoidance of doubt, this assessment may require sound file recordings to be taken and analysed.
- 39 A request in accordance with condition 38 may be made:
- 39.1 at any time after the first turbine (or group of turbines) becomes operational;
and
- 39.2 as a result of complaints regarding unreasonable noise emanating from the wind farm, in circumstances where the Council's Environmental Compliance Manager considers that such a complaint may not solely relate to a non-compliance with the noise limits from NZS6808.

- 40 The results of the assessment undertaken in accordance with condition 38 shall be submitted to the Environmental Compliance Manager of the appropriate Council within 10 working days after completion of the assessment.

Monitoring to determine any cumulative effects issues

- 41 Prior to any wind turbines becoming operational in the Northern Turbine Zones, a continuous NMT shall be installed at position representative of the noise received in the Northern Turbine Zones. The Consent Holder shall engage an appropriately qualified and experienced acoustic consultant who shall, in consultation with the Environmental Compliance Manager of Palmerston North City Council or Tararua District Council as appropriate, determine the appropriate location for the NMT.
- 42 The NMT referred to in condition 41 shall be installed for a minimum of 3 years from the date of commissioning the first turbine or group of turbines. The NMT shall be capable of collecting the following data, which shall be available to the Consent Holder (or its acoustic consultant) "on line" to enable remote evaluation of it, and saved for at least 3 months to allow subsequent analysis if required:
- 42.1 10 minute measurements of L_{Aeq} , L_{A90} and L_{Amax} ;
- 42.2 1 minute L_{Aeq} measurements;
- 42.3 One third spectral data available for the above time periods; and
- 42.4 Either direct recordings of the following meteorological data: wind speed and wind direction, or have this information available from a nearby station.
- 43 If requested by the Environmental Compliance Manager of either the Palmerston North City or Tararua District Council, the Consent Holder shall engage an appropriately qualified and experienced acoustic consultant to review the data from the NMT to determine if there has been any non-compliance with the noise consent conditions that may have resulted in a complaint, and if so, the turbines that contributed to this.

- 44 If the review of the NMT data is conclusive as to any non-compliance with the noise consent conditions, and the causes of this, the results of the review shall be submitted to the Environmental Compliance Manager of the appropriate Council within 10 working days after completion of the review.
- 45 If the review of the NMT data is not conclusive as to any non-compliance with the noise consent conditions, and the causes of this, the acoustic consultant shall as soon as reasonably practicable considering the relevant meteorological conditions undertake any additional field measurements they consider necessary to reach a conclusion as to the cause and validity of the noise complaint. The results of the field investigations shall be submitted to the Environmental Compliance Manager of the appropriate Council within 10 working days of the investigations being completed.
- 46 In the event the expert review and field investigations (if any) demonstrate a non-compliance with the noise consent conditions, and that such non-compliance would not have occurred had there not been any contribution of noise from either or both of the Northern Turbine Zone or Southern Turbine Zone (whether or not there was also any contribution of noise from the turbines of the Te Rere Hau wind farm), the requirements of condition 50 shall apply.
- 47 For the avoidance of doubt, the NMT required in accordance with condition 41 may be one of the NMTs required in accordance with condition 29.

Response to Noise Monitoring and Assessment

- 48 The Consent Holder shall provide copies of any reports or assessments submitted in accordance with conditions 34, 36, 40, 44, or 45 to the CLG, within the same timeframes as the respective clauses require they be submitted to the appropriate Council(s).
- 49 If the monitoring or assessments undertaken in accordance with conditions 29, 35, 38 and 41 show there has not been any non-compliance with the noise consent conditions nor any unreasonable noise finding, then the Consent Holder shall not

be required to take any further action by way of response to that monitoring and assessment.

50 If the monitoring or assessments undertaken in accordance with conditions 29, 35 or 38 show there has been any non-compliance with the noise consent conditions and/or there is an unreasonable noise finding, or the circumstances in condition 46 apply:

50.1 As soon as reasonably practicable, the Consent Holder shall engage an appropriately qualified and experienced acoustic consultant to undertake such assessment as may be necessary to determine which turbine(s) are likely to be causing the non-compliance or unreasonable noise (if this has not already been determined);

50.2 Within 1 working day of being advised which turbine(s) are likely to be causing the non-compliance or unreasonable noise, the Consent Holder shall de-rate, including if necessary stopping, those turbines;

50.3 Once de-rated, the relevant turbines may only be re-commissioned after the Consent Holder has undertaken such repairs, testing and/or any other measures as may be necessary to ensure that those turbines can be operated without causing any non-compliance with the noise consent conditions or unreasonable noise;

50.4 For the avoidance of doubt, during the time that any turbine is subject to de-rating in accordance with condition 50.3:

- a. the relevant turbine(s) may be operated in such circumstances and for such durations as may be necessary for undertaking compliance testing;
- b. the relevant turbine(s) may be operated at such times or in such meteorological conditions where the monitoring or assessments undertaken in accordance with conditions 29, 35, 38 and 41 have

confirmed that the operation of the turbines in those conditions will not result in any non-compliance with the noise consent conditions; and

- c. the Consent Holder shall submit a weekly report to the Palmerston North City Council's Environmental Compliance Manager and the CLG outlining the current status of the investigations being undertaken with respect to the relevant turbines.

50.5 When any turbine (or turbines) are re-commissioned in accordance with condition 50.3, the Consent Holder shall engage an appropriately qualified and experienced acoustic consultant to undertake such further monitoring and assessment as the consultant considers necessary to confirm that the turbine (or turbines) are now operating in compliance with the noise consent conditions. The results of this monitoring or assessment shall be submitted to the Palmerston North City Council's Environmental Compliance Manager and the CLG within 10 working days of the turbine (or turbines) being re-commissioned.

50.6 For the avoidance of doubt, if the monitoring and assessment undertaken in accordance with condition 50.5 shows that there is still a non-compliance with the noise consent conditions, the requirements of conditions 50.1 to 50.5 shall apply as appropriate and necessary.

Review of Noise Conditions

51 In accordance with section 128 of the Act, the Palmerston North City and Tararua District Councils may serve notice on the Consent Holder of its intention to review any of the noise conditions of this consent:

51.1 if the wind turbine generators are installed in stages, at 1 year after completion of the first and each subsequent stage, 3 and 5 years after the final completion and then every 5 years thereafter; or

51.2 if the wind turbine generators are not installed in stages, at 1, 3 and 5 years after the completion of all construction works and then every 5 years thereafter.

52 Any reviews must be completed within 6 months of the notice being given in accordance with condition 51.

Traffic

Roading Upgrades

53 The Consent Holder shall, at its own cost, undertake improvements to the southern access route to the site before any use of the Greens Road site access by construction traffic. This does not preclude use of the Greens Road access for investigation and design, to undertake the necessary roading improvements, or as an adjunct to the roading upgrades (such as for spoil disposal or vehicle storage). The improvements to be undertaken are:

53.1 Benching to improve sight distance on Kahuterawa Road at a location 2.9km south of SH57, in general accordance with Traffic Design Group drawing 8488-3W1 Sheet 13 attached as Appendix 1 to this Schedule.

53.2 Widening, benching and pavement upgrades to provide safe two-way movement on Greens Road, in general accordance with Beca drawing 0848RK222 Revision C attached as Appendix 2 to this Schedule.

53.3 Seal extensions to provide a continuous sealed surface on Greens Road between Kahuterawa Road and the site access, with provision to ensure the design and construction provide an appropriate surface with respect to tyre noise.

53.4 Sealing of the first 1000m of the site access on Part Section 276 Town of Fitzherbert (WN45A/638) (Love property driveway) in general accordance with the drawing as Appendix 3 to this Schedule.

- 54 The Consent Holder shall, at its own cost, develop a new intersection of South Range Road and Pahiatua-Aokautere Road before any use of South Range Road by construction traffic. This does not preclude use of the existing intersection for investigation and design, or as an adjunct to the roading upgrades (such as for spoil disposal or vehicle storage). The development of the intersection is to include:
- 54.1 An intersection layout for the duration of construction to the standard of the NZTA Planning Policy Manual (SP/M/001 August 2007) Diagram D layout, in general accordance with either Traffic Design Group drawing 8488-3W1 Sheet 7, Revision B, or Traffic Design Group drawing 8488-3W1 Sheet 8, Revision A attached as Appendix 4 to this Schedule.
- 54.2 A new length of road connecting the new intersection with the existing alignment of South Range Road, to be vested to Palmerston North City Council.
- 54.3 Physically closing the existing intersection once the new intersection and alignment of South Range Road is constructed, but prior to commencement of wind farm construction, subject to necessary approvals from Palmerston North City Council and Tararua District Council.
- 55 The Consent Holder shall, at its own cost, undertake improvements to Pahiatua-Aokautere Road in the vicinity of the eastern site access in general accordance with Traffic Design Group drawing 8488-3W1 Sheet 9, Revision A attached as Appendix 5 to this Schedule, or to an alternative standard approved by Tararua District Council, before any use of the eastern site access by construction traffic. This does not preclude use of the eastern Pahiatua-Aokautere Road access for investigation and design, or as an adjunct to the roading upgrades (such as for spoil disposal or vehicle storage). If the Consent Holder elects not to use this access for construction or operation of the wind farm, the Consent Holder is not required to undertake the improvements.

56 The Consent Holder shall, at its own cost, undertake such road improvements as are necessary to facilitate the movement of over-dimension loads to the site. These may include:

56.1 The hairpin bend on Pahiatua-Aokautere Road, 5.2km southeast of SH57.

56.2 The intersection of Makomako Road and Pahiatua-Mangahao Road.

56.3 The full length of South Range Road.

57 At least 30 working days prior to the commencement of any roading upgrades, the Consent Holder shall submit engineering plans prepared by a Chartered Professional Engineer to the Palmerston North City or Tararua District Council's Roading Manager (as appropriate) outlining details of the proposed works. Designs shall be prepared in accordance with the ARRB Unsealed Roads Manual, Guidelines to Good Practices (August 2000) (or its subsequent equivalent) or a similar standard acceptable to Council's Roading Manager.

Advice Note

Under the Local Government Act, the written approval of Council's Roading Manager is required prior to any changes being made to any public road. This approval will include requirements for temporary traffic management during the roading upgrade works.

Pavement Maintenance

58 Prior to the commencement of any construction works, the Consent Holder shall engage a Chartered Professional Engineer to undertake a road condition survey and report of South Range Road and Greens Road, with particular regard to road geometry, structural integrity and slope stability. The purpose of the survey shall be to obtain an accurate baseline of the existing road condition. The engineer's report shall include a maintenance regime to ensure the roads are kept to a standard suitable for continuous use by other road users during construction.

- 59 The Consent Holder shall, at its own cost, maintain South Range Road and Greens Road in accordance with the recommendations of the engineer's report for the duration of construction.
- 60 The Consent Holder shall, at its own cost, sweep Kahuterawa Road during the period that Greens Road is being used by construction traffic, at such frequency as is necessary to ensure the shoulders and edges of the road are clear of debris and in a safe condition for use by cyclists.

Construction Traffic Management

- 61 Trucks shall generally enter and exit the site via the access(es) on Pahiatua-Aokautere Road and only use the Greens Road access when it is impractical for that truck to use the Pahiatua-Aokautere Road access(es). Potential reasons for such access to be impractical include:
- 61.1 During the initial stage of construction when the central portion of the internal road is being upgraded.
- 61.2 When excavations close portions of the internal road.
- 61.3 When the crawler crane is in such a position that it blocks portions of the internal road.
- 62 In total, no more than 5,800 truck movements shall occur through the Greens Road access during construction.
- 63 Vehicles entering or exiting the site shall only travel on Greens Road or Kahuterawa Road at the following times:

Time Period	Light Vehicles	Trucks
Weekdays	No restrictions	6:30am to 7:30am; 8:15am to 3:15pm; and 4:30pm to 6:00pm; except that trucks shall not use the road

		when particular events, notified through community consultation, are held, and which involve a peak in the presence of vulnerable road users, such as equestrian or cycling events. In addition, the prohibition on access from 7:30am to 8:15am, and 3:15pm to 4:30pm only applies on school days.
Weekends and statutory holidays	6:30am to 7:30am; and 5:00pm to 6:00pm; except that up to 10 other light vehicle movements may occur outside of these times each day.	No truck access, except that up to 6 truck movements per day may occur on weekends and statutory holidays between the hours of 8am and 6pm.

- 64 In addition to the traffic permitted above, light vehicle access is allowed at any time for the purposes defined in condition 64.1 and 64.2, with light vehicle and truck access allowed at any time for the purpose defined in condition 64.3:

64.1 Site security staff;

64.2 A site supervisor and related staff directly associated with monitoring the site in relation to health and safety, and environmental effects;

64.3 Maintenance/emergency staff and vehicles requested by the site security or site monitoring staff to carry out emergency maintenance works or to respond to a health and safety matter that cannot reasonably wait until a weekday.

- 65 Vehicles associated with construction of any of the Northern Turbine Zones, if built as a separate stage in advance of the Southern Turbine Zones without the internal transmission line and Browns Flat substation, shall not access the site via the Greens Road access.

- 66 Vehicles associated with construction of any of the Northern Turbine Zones, if built as a separate stage in advance of the Southern Turbine Zones but including the Browns Flat substation, may only access the site via the Greens Road access if they are directly associated with construction of the Browns Flat substation, internal 33kV transmission line and external 220kV transmission line. Daily traffic levels using the access for this purpose shall not exceed 34 truck movements and 60 light vehicle movements.
- 67 Subject to conditions 61 to 66 above, daily totals of vehicle access through the Greens Road access shall not exceed the following maximums:

Period	Vehicle Type	Max. Number of Vehicle Movements
First 5 months of construction of southern turbines, including construction of the Greens Road upgrade, the central link of the internal road, the Browns Flat substation, and the roads and platforms for turbine strings F, G, H, J and K; but excluding investigation and design, and construction of the transmission line required for the Northern Turbine Zones (if the Northern and Southern Turbine Zones are developed as separate stages); except that the 5 month period may be extended with the written approval of Council if circumstances beyond the Consent Holder's control delay construction in accordance with the requirements of the CEMP	Trucks	34vpd except for up to 4 occasions of 60vpd in the circumstances described in condition 61 above
	Light Vehicles	60vpd
Remainder of construction period	Trucks	0vpd except for up to 6 days of 40vpd when crane is moving, and 60vpd if an unforeseen circumstance closes the

		internal road for a whole day or more
	Light Vehicles	60vpd

- 68 No overdimension turbine components shall be transported to the site via the Greens Road access.
- 69 The Consent Holder shall operate and publicise a driver comments free phone number. The free phone number shall be manned at all times when construction traffic is operating, and shall be sufficiently connected to the gatehouses to enable ready identification of any vehicles or drivers which are the subject of calls to the free phone number.
- 70 At least 40 working days prior to any construction works commencing the Consent Holder shall submit a CTMP to the Roding Manager of the respective Councils, for review in a technical certification capacity. A response should be provided within 15 working days of receipt. Construction activities must not commence until written certification has been obtained. The purpose of the CTMP shall be to set out in detail matters relating to the extent and timing of construction traffic activity, and the traffic management provisions to be put in place during this time to achieve a safe and efficient road network. The CTMP shall be prepared by a Chartered Professional Engineer following community consultation and shall cover at least the following matters:
- 70.1 Documentation of who has been consulted and involved in preparing the CTMP, which shall include the CLG, residents on South Range Road, Greens Road, and Kahuterawa Road, groups representing users of Hardings Park such as the Manawatu Mountain Biking Club, and traffic engineers from Tararua District and Palmerston North City Councils.
- 70.2 Project scheduling.
- 70.3 Travel routes.

-
- 70.4 Access details.
- 70.5 Roothing upgrades, including those referred to in conditions 53-55.
- 70.6 Traffic flows.
- 70.7 Vehicle speeds, including specific limits on South Range Road, Kahuterawa Road, and Greens Road.
- 70.8 Operating hours for each access, including those referred to in condition 63.
- 70.9 Measures to ensure trucks use the Pahiatua-Aokautere Road access(es) wherever practical, and to ensure condition 61 is complied with.
- 70.10 Measures to reduce the amount of commuter traffic by construction personnel.
- 70.11 Piloting arrangements and operating procedures for overdimension turbine component transporters.
- 70.12 Provisions for accommodating pedestrian, cycle and horse usage of the access roads.
- 70.13 Driver protocols, including prohibition on engine braking on Kahuterawa Road and the flat portion of Greens Road, and "one in one out" arrangements for trucks on Kahuterawa Road during particular peak days when more than 40 truck movements per day are envisaged.
- 70.14 Disciplinary procedures to be followed in the event that any project drivers breach the driver protocols on any other aspects of the CTMP, including that any project drivers who are the subject of a credible complaint in respect of adherence to the road rules and the CTMP shall have a vehicle tracking system (with driver behaviour functionality) installed in their vehicles.

70.15 Full details of the temporary traffic management plans to be used, including the conditions under which each plan would operate.

70.16 Procedures for communication with the local community and other road users regarding traffic management issues, including notification techniques such as emails, a dedicated website update, text messages, roadside notice boards, and/or newspaper advertisements.

70.17 Project contacts including a driver comments free phone number.

Advice note: It is only necessary that one CTMP will be prepared to cover roads within both the Palmerston North City Council boundary and the Tararua District Council boundary respectively.

71 The Consent Holder shall require all of its contractors and subcontractors comply with the approved CTMP at all times during construction and monitor compliance.

72 The Consent Holder shall update the CTMP from time to time as reasonably required by the Roding Manager of the respective Councils to maintain safety and efficiency, taking into account matters raised by the public or the CLG, or to reflect changes to the project.

Traffic Monitoring

73 The Consent Holder shall keep a record of all vehicles travelling in and out of the site during construction, including the date and time, which access has been used, whether the vehicle is entering or exiting, and whether the vehicle is a light vehicle (car or van) or truck. Records shall be submitted to Roding Manager of the respective Councils on a monthly basis.

74 The Consent Holder shall keep a record of any instance where truck access is required outside the prescribed limits for the purpose of carrying out emergency maintenance works or responding to a health and safety matter, as provided for by condition 64 and report these to the respective Councils within 48 hours with an explanation as to why the emergency truck access was needed.

- 75 The pavement surfaces on Greens Road and South Range Road shall be inspected by a suitably qualified engineer as required and reported to the Roding Manager of the respective Council(s) (as appropriate) on a monthly basis along with details of maintenance that has been undertaken to ensure compliance with conditions 59 and 60.
- 76 The Consent Holder shall keep a record of all calls to the driver comments free phone number and provide a summary to Roding Manager of the respective Councils within 5 working days of a request. The summary shall also include a review of the effectiveness of the CTMP.

Review of Conditions

- 77 In accordance with section 128 of the Act, the Palmerston North City and Tararua District Councils may at any time during construction works, serve notice on the Consent Holder of its intention to review the traffic related conditions of this consent for the following purposes:
- 77.1 To require reasonable steps to be taken to avoid, remedy or mitigate any adverse effect on the environment resulting from traffic related to the wind farm, either directly or indirectly.
- 77.2 To review the adequacy and implementation of any recommendations of the CTMP.

Post Construction Road Alterations and Inspections

- 78 Within 10 working days of the completion of all construction works, the Consent Holder shall notify the Roding Manager of the respective Councils so they may undertake a survey of South Range Road and Greens Road to confirm that the roads are in a condition which is the same or better than indicated in the pre-construction road condition survey and report referred to in condition 58. The Consent Holder shall undertake any such remedial works as are considered necessary by an independent Chartered Professional Engineer to achieve the standard recorded in the pre-construction road condition survey and report.

- 79 Within 30 working days of the completion of all construction works, the Consent Holder shall amend the layout of the new intersection of Pahiatua-Aokautere Road and South Range Road. The purpose of the amendments shall be to reduce the corner radii and the width of the South Range Road approach to an appropriate permanent standard acceptable to Palmerston North City Council's Roading Manager.

Post Construction Access

- 80 Following the completion of all construction works, trucks associated with maintenance of the wind farm shall enter and exit the site via the northern access on South Range Road, and only use the Greens Road access in cases of emergency.

Lighting

- 81 No static night time illumination is permitted within the wind farm site, other than for maintenance, construction and security purposes, or as required by the CAA.
- 82 Permitted night time illumination shall be utilised in a manner than does not cause a nuisance beyond the boundary of the wind farm site.
- 83 Any lighting installed on turbines shall be installed in accordance with CAA requirements and shall be shrouded (as appropriate and subject to CAA requirements) to ensure there is no direct light spill when viewed from ground level.

Television Interference

- 84 The Consent Holder shall remedy any analogue television interference that is a direct result of the installation and operation of the wind turbines as soon as practicable after receiving confirmation such interference has occurred. The remedy will be restoration of reception for free to air channels at the Consent Holder's cost.

Electric and Magnetic Fields

- 85 Electric and Magnetic Fields shall comply with guidelines for public exposure to electric and magnetic fields as published in 1998 by the International Commission on Non-Ionizing Radiation Protection (or its subsequent equivalent).

Electrical Safety

- 86 All transmission lines shall be designed and constructed to comply with the New Zealand Electrical Code of Practice for Electrical Safe Distances (NZECP 34:2001).
- 87 As far as possible, all electrical infrastructure installed in the wind farm shall be covered or insulated to prevent ready access by or electrocution of birds.

Landscape Plans

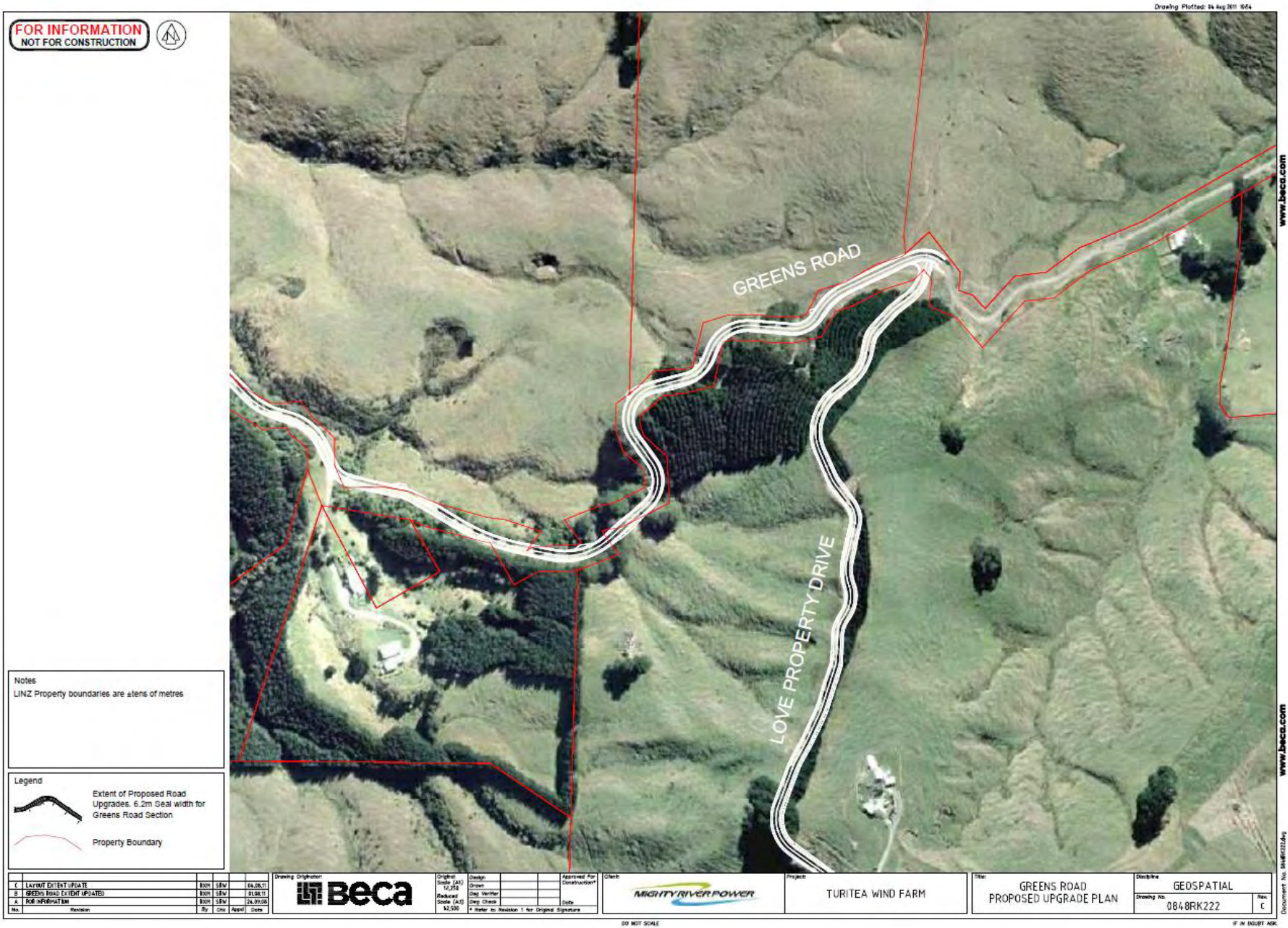
- 88 At least 40 working days prior to the commencement of any construction works, the Consent Holder must submit to Palmerston North City Council's Environmental Compliance Manager detailed landscape plans for all cut and fill earthworks and permanent buildings. These plans must:
- 88.1 Identify the disposal sites for fill, which must be in general accordance with the positions shown on the material identified in condition 25 of Schedule 2;
 - 88.2 Provide for the integration of cut and fill earthworks with the surrounding landform where practicable;
 - 88.3 Detail revegetation plantings; and
 - 88.4 Detail proposed colours, materials and landscaping of the substation buildings, maintenance building and associated areas.
- 89 The Consent Holder must ensure that all cut and fill earthworks, disposal of fill and landscaping is undertaken in accordance with the landscape plan submitted to Council.

Appendix 1: Kahuterawa Road Upgrades (TDG drawings 8488-3W1 Sheet 13)





Appendix 2: Green’s Road Upgrades (Beca Drawing 0848RK222 Revision C)





Appendix 3: Indicative Length of Sealing – Green’s Road Site Access (Part Section 276 Town of Fitzherbert (WN45A/638))



Indicative Length of Sealing (shown in yellow)

Appendix 4A: Pahiatua-Aokautere Road/South Range Road Intersection (TDG drawing 8488-3W1 Sheet 7, Revision B)



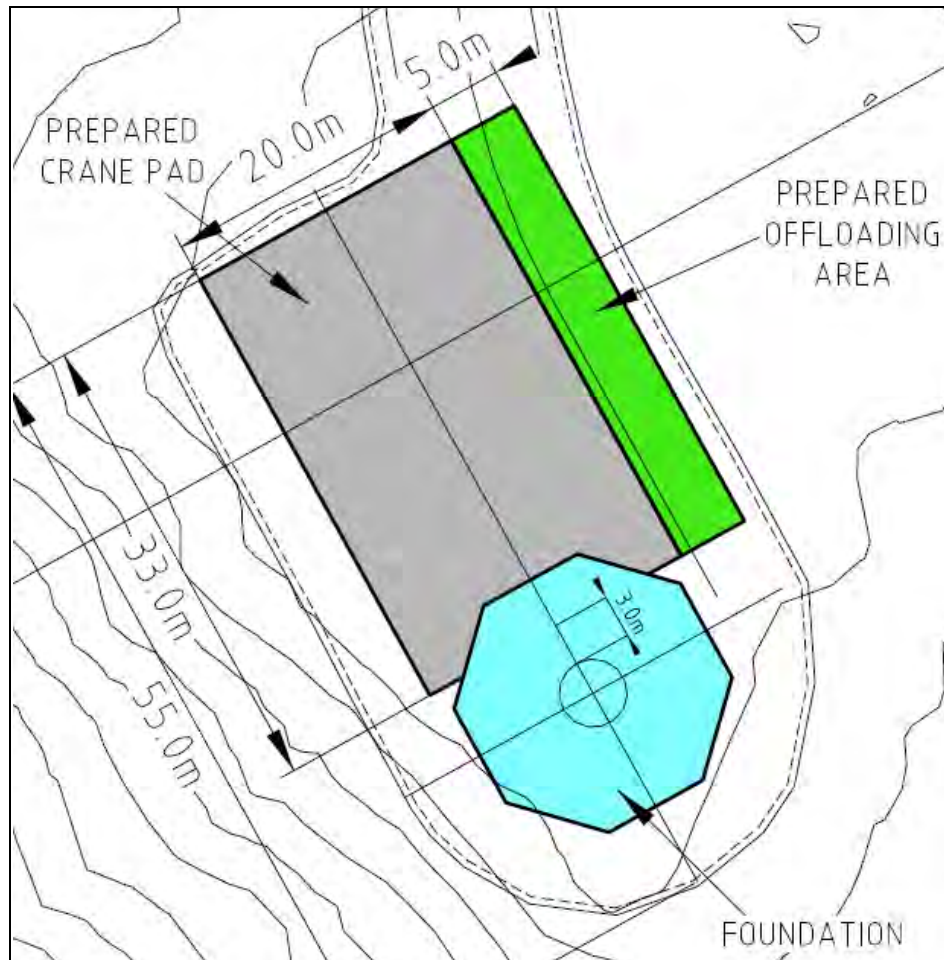
Appendix 4B: Pahiatua-Aokautere Road/South Range Road Intersection (TDG drawing 8488-3W1 Sheet 8, Revision A)



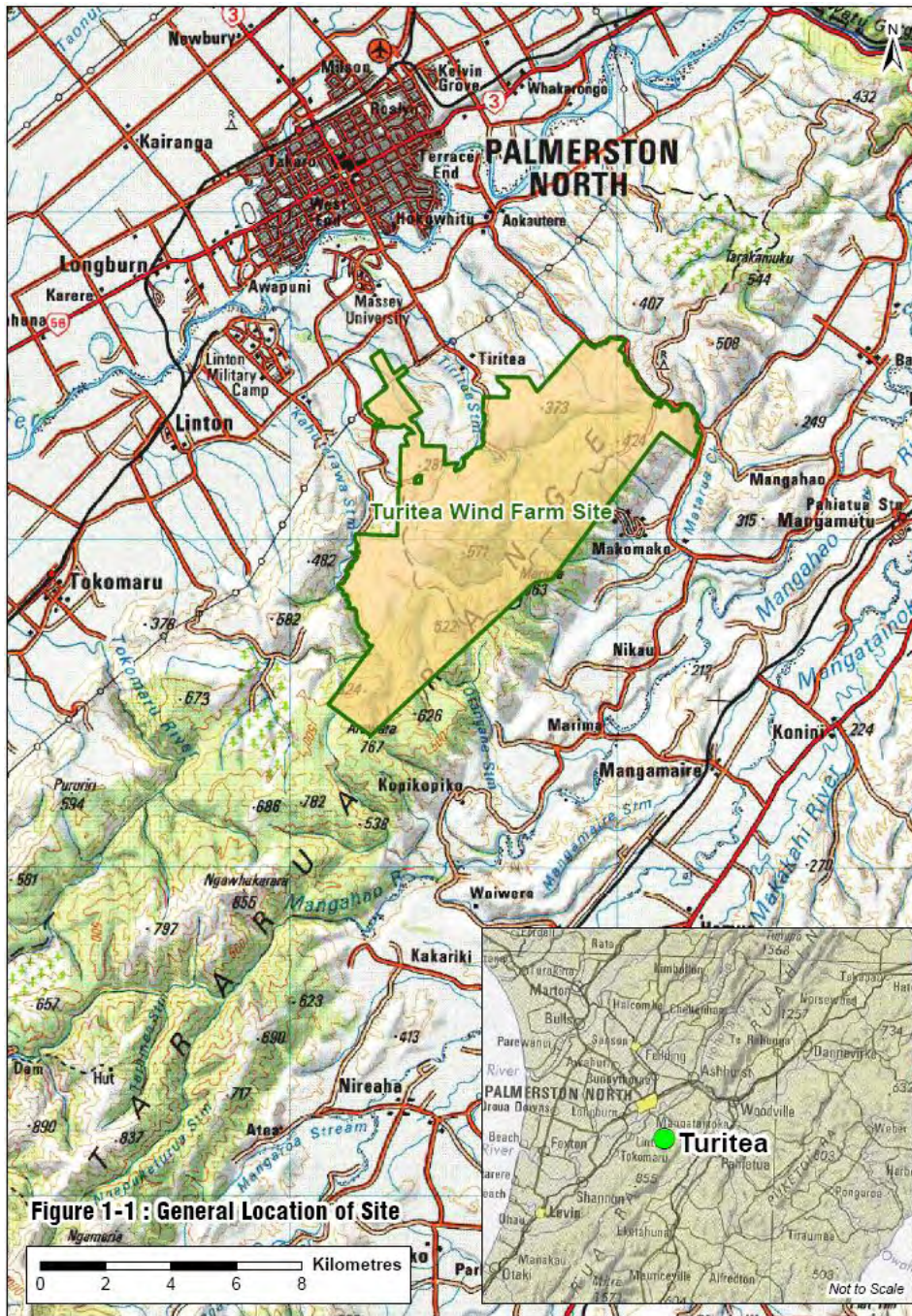
Appendix 5: Pahiatua-Aokautere Road – Eastern Site Access (TDG drawing 8488-3W1, Sheet 9, Revision A)



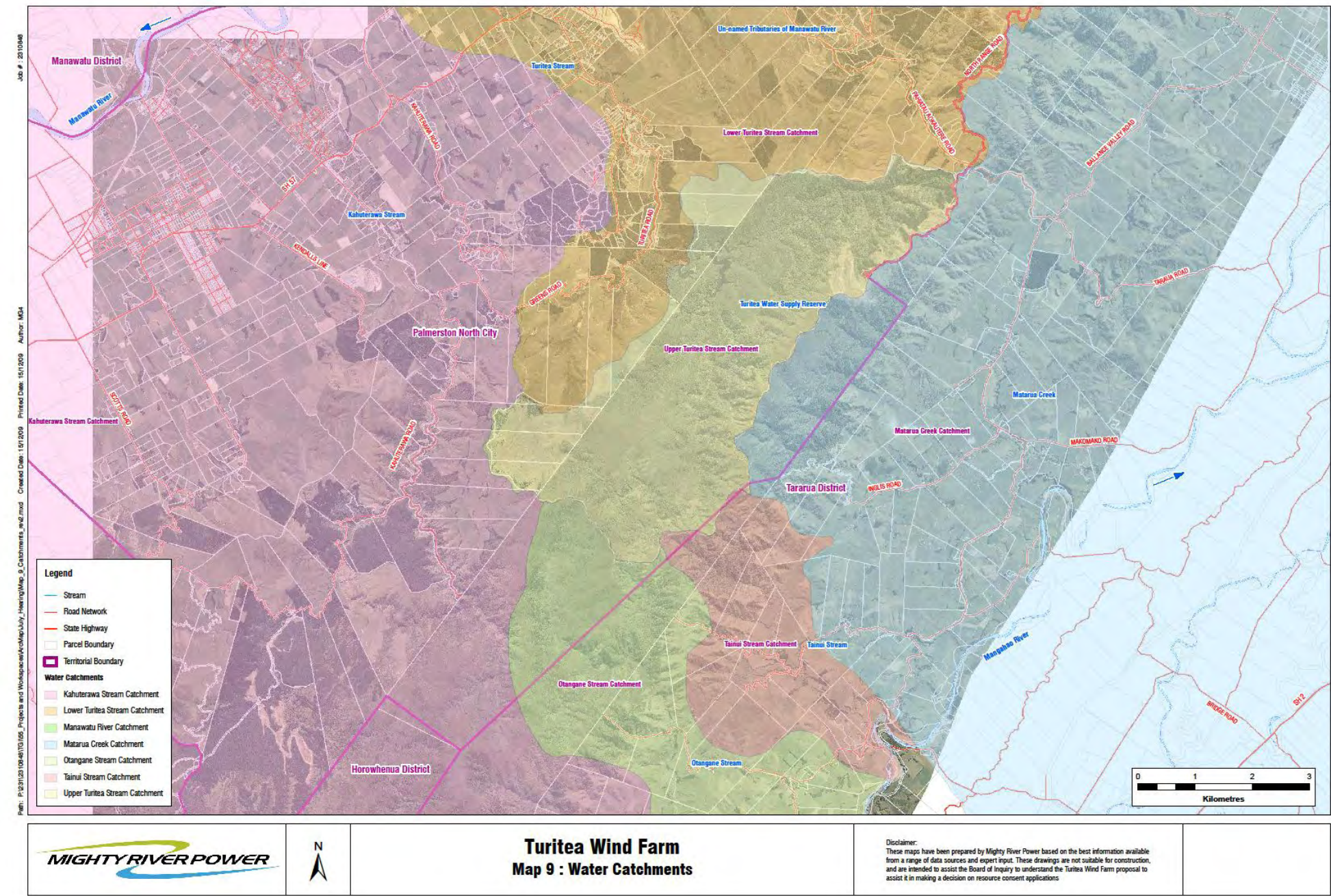
Attachment 1 to the Conditions: Indicative Turbine Platform (Figure 4-5 of AEE)



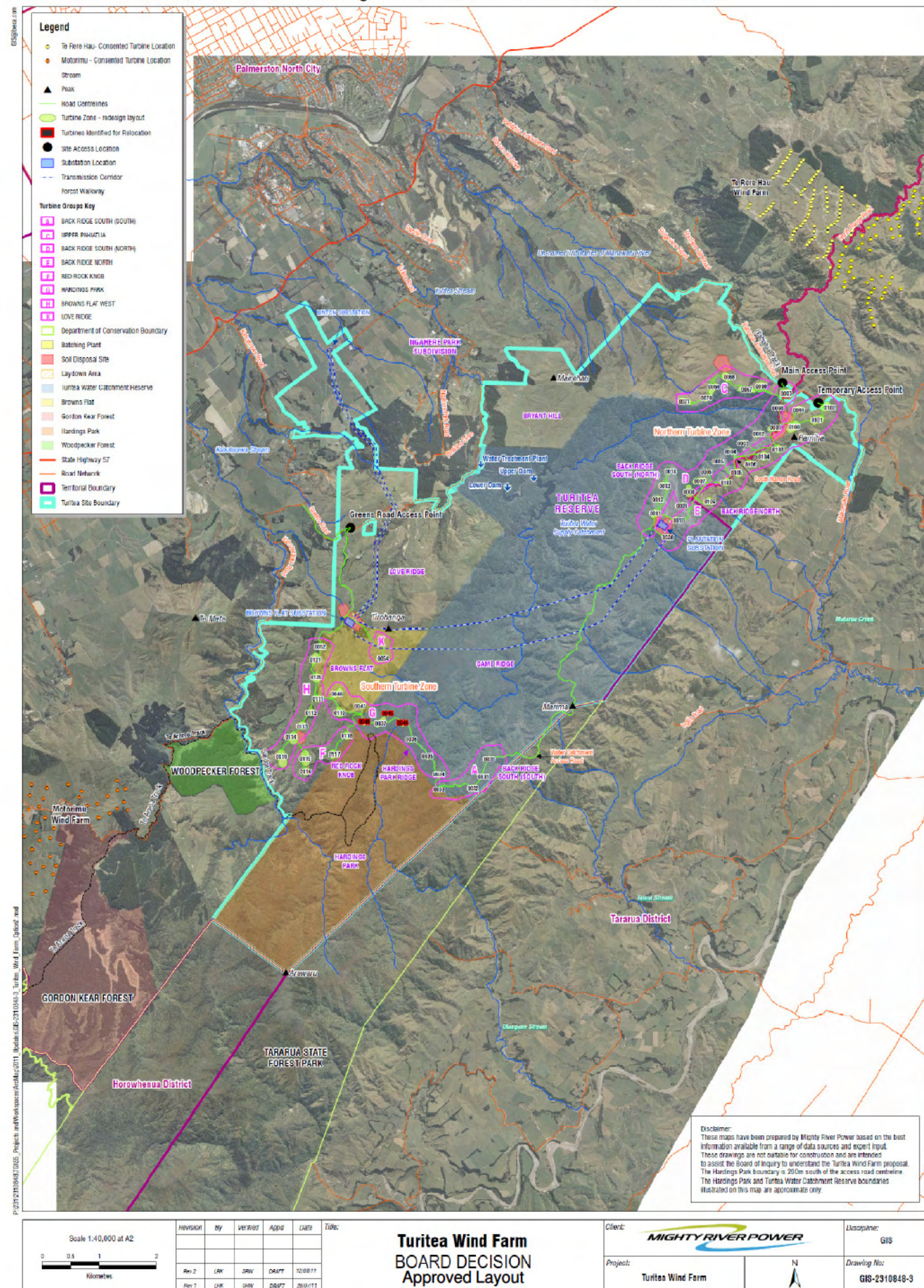
Attachment 2 to the Conditions: Indicative Application Site (Figure 1-1 of AEE)



Attachment 3 to the Conditions: Turitea Water Supply Catchment (“Upper Turitea Catchment”)



Attachment 4 to the Conditions: Plan showing Northern and Southern Turbine Zone Areas.



DATED at Wellington this 6th day of September 2011

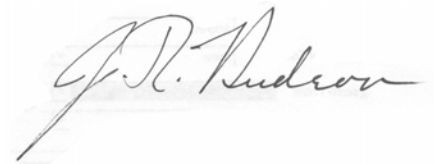
For Board of Inquiry

A handwritten signature in blue ink, appearing to read "S. E. Kenderdine".

Environment Judge Shonagh Kenderdine (Chairperson)

A handwritten signature in blue ink, appearing to read "David Bunting".

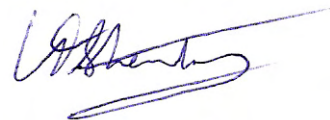
Environment Commissioner David Bunting (Member)

A handwritten signature in black ink, appearing to read "J. N. Hudson".

Mr John Hudson (Member)

A handwritten signature in black ink, appearing to read "R. Heerdegen".

Mr Richard Heerdegen (Member)

A handwritten signature in blue ink, appearing to read "Chris Shenton".

Mr Chris Shenton (Member)

Glossary

AEE	Assessment of Environmental Effects
AEP	Annual Exceedence Probability
ARI	Average recurrence interval (with reference to rainfall)
Background sound level	The A-frequency-weighted L90 centile level measured prior to the installation of any wind turbines in an area
BOD	Biochemical Oxygen Demand
BOI	Board of Inquiry
BPO	best practicable option
BWQMP	Baseline Water Quality Monitoring Programme
CEMP	Construction and Environmental Management Plan
CNMP	Construction Noise Management Plan
CO ₂	carbon dioxide
CTMP	Construction Traffic Management Plan
CVA	Cultural Values Assessment
DOC	Department of Conservation
DWSNZ	Drinking Water Standards of New Zealand
EECA	Energy Efficiency and Conservation Authority
EIC	Evidence-in-chief
ENSO	El Niño Southern Oscillation
FOTR	Friends of the Turitea Reserve Incorporated
GWh	Gigawatt-hour
GWRC	Greater Wellington Regional Council
HAC	Hegley Acoustic Consultant
HDVC	high-voltage direct current
Hertz (Hz)	the unit for the frequency of a sound in cycles per second
HRC	Horizons Regional Council
ICNIRP	International Commission on Non-Ionising Radiation Protection Guidelines
IEC	International Electrotechnical Commission
IPO	Interdecadal Pacific Oscillation
kV	Kilovolts
Low frequency sound	Sound below about 200Hz

LRMC	Long-run marginal cost
MDA	Marshall Day Acoustics
MfE	Ministry for the Environment
MOU	Memorandum of Understanding
MRP	Mighty River Power Limited
MW	Megawatt
NIWA	National Institute of Water and Atmospheric Research
NMP	Noise Management Plan or Noise Monitoring Points depending on context
NMT	Noise Monitoring Terminals
NOE	Notes of Evidence (Transcripts)
NPS	National Policy Statement
NPSREG	National Policy Statement on Renewable Electricity Generation
NZEECS	New Zealand Energy Efficiency and Conservation Strategy
NZES	New Zealand Energy Strategy
NZS	New Zealand Standard
NZWEA	New Zealand Wind Energy Association
ONF	Outstanding Natural Feature
ONL	Outstanding Natural Landscape
OS	Opening Statement
OSNZ	Ornithological Society New Zealand
PHRMP	Public Health Risk Management Plan
PNCC	Palmerston North City Council
PNCCDP	Palmerston North City Council District Plan
POP	Proposed One Plan (Horizons Regional Council)
RE	Rebuttal Evidence
RLTS	Regional Land Transport Strategy (Horizons Regional Council)
RMA	Resource Management Act 1991
ROM	Rangitane o Manawatu
ROTNAR	Rangitane o Tamaki nui a Rua
RPS	Regional Policy Statement
SAC	Special Audible Characteristics
SEMP	Site Environmental Management Plan

SS	Supplementary Statement
TAG	Tararua-Aokautere Guardians Incorporated
TDC	Tararua District Council
TDP	Tararua District Plan
TMI	Tanenuiarangi Manawatu Incorporated
TMP	Traffic Management Plan
TRMP	Turitea Reserve Management Plan
<i>Turitea</i>	The word refers to the Turitea wind farm site, ie, both the Turitea Reserve and pastoral foothills and the proposed wind farm itself.
WT	Wind Turbine used to reference specific turbine numbers as shown on Redesign Site Layout in Appendix 4

APPENDIX 1

Resource Management Act 1991

2 Interpretation

Amenity Values is defined as:

means those natural or physical qualities and characteristics of an area that contribute to people's appreciation of its pleasantness, aesthetic coherence, and cultural and recreational attributes.

Best Practicable Option is defined as:

in relation to a discharge of a contaminant or an emission of noise, means the best method for preventing or minimising the adverse effects on the environment having regard, among other things, to—

- (a) The nature of the discharge or emission and the sensitivity of the receiving environment to adverse effects; and
- (b) The financial implications, and the effects on the environment, of that option when compared with other options; and
- (c) The current state of technical knowledge and the likelihood that the option can be successfully applied

Biological diversity is defined as:

means the variability among living organisms, and the ecological complexes of which they are a part, including diversity within species, between species, and of ecosystems.

Intrinsic values is defined as:

in relation to ecosystems, means those aspects of ecosystems and their constituent parts which have value in their own right, including—

- (a) Their biological and genetic diversity; and
- (b) The essential characteristics that determine an ecosystem's integrity, form, functioning, and resilience.

Natural and physical resources are defined as:

includes land, water, air, soil, minerals, and energy, all forms of plants and animals (whether native to New Zealand or introduced) and all structures.

5 Purpose

- (1) The purpose of this Act is to promote the sustainable management of natural and physical resources.
- (2) In this Act, **sustainable management** means managing the use, development, and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic, and cultural wellbeing and for their health and safety while—
 - (a) Sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and
 - (b) Safeguarding the life-supporting capacity of air, water, soil, and ecosystems; and
 - (c) Avoiding, remedying, or mitigating any adverse effects of activities on the environment.

6 Matters of national importance

In achieving the purpose of this Act, all persons exercising functions and powers under it, in relation to managing the use, development, and protection of natural and physical resources, shall recognise and provide for the following matters of national importance:

- (a) The preservation of the natural character of the coastal environment (including the coastal marine area), wetlands, and lakes and rivers and their margins, and the protection of them from inappropriate subdivision, use, and development;
- (b) The protection of outstanding natural features and landscapes from inappropriate subdivision, use, and development;
- (c) The protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna;
- ...
- (e) The relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga;
- (f) the protection of historic heritage from inappropriate subdivision, use, and development;
- (g) the protection of recognised customary activities.

7 Other matters

In achieving the purpose of this Act, all persons exercising functions and powers under it, in relation to managing the use, development, and protection of natural and physical resources, shall have particular regard to—

- (a) Kaitiakitanga;
- (aa) The ethic of stewardship;

- (b) The efficient use and development of natural and physical resources;
- (ba) the efficiency of the end use of energy;
- (c) The maintenance and enhancement of amenity values;
- (d) Intrinsic values of ecosystems;
- (e) ...
- (f) Maintenance and enhancement of the quality of the environment;
- (g) Any finite characteristics of natural and physical resources;
- (h) ...
- (i) The effects of climate change;
- (j) The benefits to be derived from the use and development of renewable energy.

8 Treaty of Waitangi

In achieving the purpose of this Act, all persons exercising functions and powers under it, in relation to managing the use, development, and protection of natural and physical resources, shall take into account the principles of the Treaty of Waitangi (Te Tiriti o Waitangi).

16 Duty to avoid unreasonable noise

- (1) Every occupier of land (including any premises and any coastal marine area), and every person carrying out an activity in, on, or under a water body or the coastal marine area, shall adopt the best practicable option to ensure that the emission of noise from that land or water does not exceed a reasonable level.
- (2) Subsection (1) does not limit the right of any local authority or consent authority to prescribe noise emission standards in plans made, or resource consents granted, for the purposes of any of sections 9, 12, 13, 14, 15, 15A, and 15B.

39 Hearings to be public and without unnecessary formality

- (1) Where a local authority, a consent authority, or a person given authority to conduct hearings under any of sections 33, 34, 34A, 117, 146, 202 or 357C, holds a hearing in relation to—
 - (a) A proposed policy statement, plan, or change or variation to a policy statement or plan; or
 - (b) An application for a resource consent; or
 - (c) An application for a review of a resource consent; or
 - (d) An application to change any condition of a resource consent; or

- (e) An application that has been called-in under section 141B(1)(a); or
- (f) A requirement for a designation or heritage order; or
- (g) An application for a water conservation order.

the authority shall hold the hearing in public (unless permitted to do otherwise by section 42 (which relates to the protection of sensitive information) or the Local Government Official Information and Meetings Act 1987), and shall establish a procedure that is appropriate and fair in the circumstances.

- (2) In determining an appropriate procedure for the purposes of subsection (1), the authority shall—
 - (a) Avoid unnecessary formality; and
 - (b) Recognise tikanga Maori where appropriate, and receive evidence written or spoken in Maori and the Maori Language Act 1987 shall apply accordingly; and
 - (c) Not permit any person other than the chairperson or other member of the hearing body to question any party or witness; and
 - (d) Not permit cross-examination.

40 Persons who may be heard at a hearing

- (1) At any hearing described in section 39, the applicant, and every person who has made a submission and stated that they wished to be heard at the hearing, may speak (either personally or through a representative) and call evidence.
- (2) Notwithstanding subsection (1), the authority may, if it considers that there is likely to be excessive repetition, limit the circumstances in which parties having the same interest in a matter may speak or call evidence in support.
- (3) If—
 - (a) The applicant; or
 - (b) Any person who made a submission and stated they wished to be heard at any such hearing –

fails to appear at the hearing, the consent authority may nevertheless proceed with the hearing, if it considers it fair and reasonable to do so.

41 Provisions relating to hearings

- (1) The following provisions of the Commissions of Inquiry Act 1908 apply to every hearing conducted by a local authority, a consent authority, or a person given authority to conduct hearings under sections 33, 34, 34A, 117, 146, or 202:
 - (a) Section 4, which gives powers to maintain order;
 - (b) Section 4B, which relates to evidence;

- (c) Section 4D, which gives power to summon witnesses;
 - (d) Section 5, which relates to the service of a summons;
 - (e) ... ;
 - (f) Section 7, which relates to allowances for witnesses.
- (2) Every summons to a witness to appear at a hearing shall be in the prescribed form and be signed by the chairperson of the hearing.
 - (3) All allowances for a witness shall be paid by the party on whose behalf the witness is called.
 - (4) At every hearing conducted in relation to a matter described in section 39(1), the authority may request and receive, from any person who makes a report under section 42A or who is heard by the authority or who is represented at the hearing, any information or advice that is relevant and reasonably necessary to determine the application.

88A Description of type of activity to remain the same

- (1) Subsection (1A) applies if—
 - (a) an application for a resource consent has been made under section 88; and
 - (b) the type of activity (being controlled, restricted, discretionary, or non-complying) for which the application was made under section 88, or for which the activity is treated under section 77C, is altered after the application was first lodged as a result of—
 - (i) a proposed plan being notified; or
 - (ii) a decision being made under clause 10(3) of Schedule 1; or
 - (iii) otherwise.
- (1A) ...
- (2) Notwithstanding subsection (1), any plan or proposed plan which exists when the application is considered must be had regard to in accordance with section 104(1)(b).
- (3) ...

104 Consideration of applications

- (1) When considering an application for a resource consent and any submissions received, the consent authority must, subject to Part 2, have regard to—
 - (a) any actual and potential effects on the environment of allowing the activity; and
 - (b) any relevant provisions of—
 - (i) a national policy statement;
 - (ii) a New Zealand coastal policy statement;

- (iii) a regional policy statement or proposed regional policy statement;
 - (iv) a plan or proposed plan; and
- (c) any other matters the consent authority considers relevant and reasonably necessary to determine the application.

141A Minister's power to intervene

- (1) This section applies when the Minister—
 - (a) receives a request to intervene on a matter from—
 - (i) 1 or more applicants; or
 - (ii) a local authority required to process and decide a matter; or
 - (b) decides to apply the section.
- (2) The Minister
 - (a) must have regard to the factors described in subsection (3); and
 - (b) may exercise 1 or more of the powers described in subsection (4).
- (3) The factors are—
 - (a) the extent to which a matter is or is part of a proposal of national significance under section 141B(2); and
 - (b) whether the local authorities that would process and decide the matter if the Minister did not call it in—
 - (i) have the capacity to process and decide it; and
 - (ii) consider that the exercise of any of the powers in subsection (4) would be appropriate.
- (4) The powers are—
 - (a) to decide not to intervene;
 - (b) to call in the matter under section 141B;
 - (c) to make a submission on the matter for the Crown;
 - (d) to appoint a project co-ordinator for a matter to advise the consent authority on anything relating to the matter;
 - (e) if the matter involves more than 1 consent authority, to direct the consent authorities to hold a joint hearing on the matter;
 - (f) if a consent authority appoints 1 or more hearings commissioners for a matter, to appoint 1 additional hearings commissioner for the matter.
- (5) If the Minister gives a direction under subsection (4)(e),—
 - (a) the consent authorities to which it is given must hold the joint hearing; and
 - (b) section 102 applies, with the necessary modifications, to the hearing.

- (6) If the Minister appoints a hearings commissioner under subsection (4)(f), the commissioner has the same powers, functions, and duties as a commissioner appointed by the consent authority.

141B Minister's power to call in matters that are or are part of proposals of national significance

- (1) When the Minister considers that a matter is or is part of a proposal of national significance, the Minister may call in the matter by making 1 of the following directions:
- (a) a direction that the matter be referred for decision to a board of inquiry under sections 146 to 149; or
 - (b) a direction that the matter, after the receipt of any submissions that the local authority or the Minister called for, be referred for decision to the Environment Court under section 150AA.
- (2) In deciding whether a matter is or is part of a proposal of national significance, the Minister may have regard to any relevant factor, including whether the matter—
- (a) has aroused widespread public concern or interest regarding its actual or likely effect on the environment, including the global environment; or
 - (b) involves or is likely to involve significant use of natural and physical resources; or
 - (c) affects or is likely to affect any structure, feature, place, or area of national significance; or
 - (d) affects or is likely to affect more than 1 region or district; or
 - (e) affects or is likely to affect or is relevant to New Zealand's international obligations to the global environment; or
 - (f) involves or is likely to involve technology, processes, or methods which are new to New Zealand and which may affect the environment; or
 - (g) results or is likely to result in or contribute to significant or irreversible changes to the environment, including the global environment; or
 - (h) is or is likely to be significant in terms of section 8 (Treaty of Waitangi).

147 Conduct of inquiry

- (1) The Minister must, without delay, provide a board of inquiry appointed under section 146 with—
- (a) all matters received by the Minister; and
 - (b) all submissions on the matters received by the Minister; and

- (c) all other information received by the Minister and relevant to the inquiry.
- (2) Section 101(1) to (3) applies to an inquiry, with the modifications described in subsections (3) and (4) and any other necessary modifications.
- (3) Section 101(1) to (3) applies as if—
 - (a) a board of inquiry were a consent authority; and
 - (b) the conduct of an inquiry were the hearing of an application for a resource consent; and
 - (c) the closing date for submissions on the matter called in were the closing date for submissions on an application for a resource consent.
- (4) Section 101(1) to (3) applies subject to the following:
 - (a) every inquiry must be held in public at a place near to the area to which the matter relates; and
 - (b) the factors to which the board of inquiry must have regard include—
 - (i) any relevant factor under section 141B(2); and
 - (ii) the reasons stated under section 141C(b).
- (5) A board of inquiry considering a matter that is an application for a resource consent—
 - (a) has the same powers and duties as a local authority, except that the board—
 - (i) may permit cross-examination; and
 - (ii) must keep a full record of its hearings; and
 - (b) must apply sections 37, 92, and 104 to 112 as if it were a consent authority.
- (6) A board of inquiry considering a matter that is a request for a change to be made to a regional plan or preparation of a regional plan under Schedule 1—
 - (a) has the same powers as a local authority under Part 2 of Schedule 1, except that—
 - (i) clauses 27 and 29(6) to (8) do not apply; and
 - (ii) the board may permit cross-examination; and
 - (iii) the board must keep a full record of its hearings; and
 - (b) must apply sections 37 and 66 to 70B as if it were a regional council.
- (7) A board of inquiry considering a matter that is a change to a district plan under Schedule 1—
 - (a) has the same powers as a local authority under Part 2 of Schedule 1, except that—

- (i) clauses 27 and 29(6) to (8) do not apply; and
 - (ii) the board may permit cross-examination; and
 - (iii) the board must keep a full record of its hearings; and
 - (b) must apply sections 37 and 74 to 77D as if it were a territorial authority.
- (8) A board of inquiry considering a matter that is a notice of requirement under any of sections 168, 168A, 189, and 189A—
- (a) has the same powers as a territorial authority, except that the board—
 - (i) may permit cross-examination; and
 - (ii) must keep a full record of its hearings; and
 - (b) must apply sections 37, 169 to 171, and 175 as if it were a territorial authority; and
 - (c) must apply section 173 as if it were a territorial authority, except that its statement of the time within which an appeal may be lodged must say that the appeal is under section 149A; and
 - (d) must consider whether to confirm the requirement, modify it, impose conditions on it, or withdraw it; and
 - (e) for the purposes of paragraph (d), has the same powers as—
 - (i) a requiring authority under section 172; or
 - (ii) a heritage protection authority under section 192.

148 Board to produce draft report

- (1) As soon as practicable after a board of inquiry has completed an inquiry under section 147, it must—
 - (a) make its draft decision; and
 - (b) produce a draft written report.
- (2) The draft report—
 - (a) must state the board's draft decision; and
 - (b) must give reasons for the decision; and
 - (c) must include the principal issues; and
 - (d) must include the findings of fact; and
 - (e) may recommend that changes be made to a plan, regional policy statement, national policy statement, or New Zealand coastal policy statement in addition to any changes that may result from the implementation of the draft decision; and
 - (f) may recommend that a national policy statement or a New Zealand coastal policy statement be issued or revoked, in addition to any action that may result from the implementation of the draft decision.

- (3) The board must send a copy of the draft report to—
 - (a) the applicants to whom the report relates; and
 - (b) the local authority that received the matter; and
 - (c) any other relevant local authorities; and
 - (d) the persons who made submissions; and
 - (e) the Minister of Conservation, if the report relates to the functions of the Minister; and
 - (f) the Minister.
- (4) The board must invite the persons to whom the draft report is sent to send their comments on any aspect of it to the board within 20 working days of the date of the invitation.

149 Board to produce final report

- (1) As soon as practicable after the 20 working days referred to in section 148(4), the board of inquiry must—
 - (a) consider any comments received; and
 - (b) make its decision; and
 - (c) produce a written report.
- (2) The report—
 - (a) must state the board's decision; and
 - (b) must give reasons for the decision; and
 - (c) must include the principal issues; and
 - (d) must include the findings of fact; and
 - (e) may recommend that changes be made to a plan, regional policy statement, national policy statement, or New Zealand coastal policy statement in addition to any changes that may result from the implementation of the decision; and
 - (f) may recommend that a national policy statement or a New Zealand coastal policy statement be issued or revoked, in addition to any action that may result from the implementation of the decision.
- (3) The board must send a copy of the report to—
 - (a) the applicants to whom the report relates; and
 - (b) the local authority that received the matter; and
 - (c) any other relevant local authorities; and
 - (d) the persons who made submissions; and
 - (e) the Minister of Conservation, if the report relates to the functions of the Minister; and
 - (f) the Minister.

- (4) The board must—
 - (a) publish the report; and
 - (b) give public notice of where and how copies of it can be obtained.
- (5) If the board decides that a plan must be changed, the relevant local authority must deal with the decision under clause 16 of Schedule 1 as if the decision were a direction of the Environment Court.

Commissions of Inquiry Act 1908

4B Evidence

- (1) The Commission may receive as evidence any statement, document, information, or matter that in its opinion may assist it to deal effectively with the subject of the inquiry, whether or not it would be admissible in a Court of law.
- (2) The Commission may take evidence on oath, and for that purpose a member or officer of the Commission may administer an oath.
- (3) The Commission may permit a person appearing as a witness before it to give evidence by tendering a written statement and, if the Commission thinks fit, verifying it by oath.

Interpretation Act 1999

5 Ascertaining meaning of legislation

- (1) The meaning of an enactment must be ascertained from its text and in the light of its purpose.
- (2) The matters that may be considered in ascertaining the meaning of an enactment include the indications provided in the enactment.
- (3) Examples of those indications are preambles, the analysis, a table of contents, headings to Parts and sections, marginal notes, diagrams, graphics, examples and explanatory material, and the organisation and format of the enactment.

APPENDIX 2

Turitea Wind Farm: Appearances

(6 July 2009 – 7 July 2009, 29 July 2009, 31 July 2009 – 25 August 2009, 31 August 2009 – 1 September 2009, 15 March 2010 – 17 March 2010, 30 March 2010)

Counsel:

Mighty River Power Limited

Mr N RW Davidson QC

Ms H C Andrews

Ms K R Price

Ms K M Bell

Palmerston North City Council

Mr J Maassen

Ms B Pearce

Mr J Reardon

Horizons Regional Council

Ms L Blomfield

Counsel and Representatives:

Tararua-Aokautere Guardians Inc and Friends of the Turitea Reserve Inc

Mr M McClelland

Dr A Cookson

Ms P Tancock

Mrs L Dome

Mr K Low

Ngawai Farm Ltd, J Poff, Dr and Mrs Alley and Mr and Mrs Love

Mr K Johnston

Ms P Davidson

Huatau Marae

Mr W Johnson

Witnesses:**Mighty River Power Limited**

G Alexander	C James
J Baines	E Kalafatelis
P Baker	T Layton
Dr D Black	G Levy
S Brown	A Parsons
R Clough	P Philips
B Coffey	G Pollock
B Coombs	Dr M Salinger
J Craig	C Shaw
C Day	W Shaw
R Galloway	S Vaughan
Dr M Heffernan	A Watson
N Hegley	G Williamson
J Hills	P Wong Too
M Henry	A Wyatt

Palmerston North City Council

C Anstey	N Lloyd
J Baker	J Male
P Blaschke	M Meluish
J van der Leden	C Taylor

Horizons Regional Council

P Hindrup

Board

P Botha	J Meade Rose
Dr S Chiles	Dr J Trevathan
Professor P Dickinson	D Wanty
S Forbes	J Williams
Mr N Mark-Brown	

Tararua-Aokautere Guardians Inc and Friends of the Turitea Reserve Inc (TAG & FOTR)

S Bray	D Lucas
A Cookson	R Mikkelsen
L Dome	A Palmer
I Gabites	Dr R Thorne
M Joy	L Tremain
K Low	

Energy Efficiency and Conservation Authority

S Torrens

New Zealand Wind Energy Association

F Clark

Department of Conservation

E Jamieson

Huatau Marae

W Johnson
P Jones

Tanenuirangi Manawatu Inc

P Horton

Ngawai Farm Ltd

B Waters

He Kupenga Hao I Te Reo

I Christensen

Taranaki-Wanganui Conservation Board

Dr C Cheyne

Cycle Aware Manawatu

D Esselmont

Palmerston North City Environment Trust

T Kelly and B Barrett

Royal Forest and Bird Society

D Kerr

Submitters:

(some submitters appeared twice)

J Adams	K Kelliher
R Adams	A Kells
M Alley	J Kelly
D Alley	D Klein
R Allen	J and S Lang
D Argyle	R Lawler
M A Bailey	M Levin
C Baker	A Lewis
A Baldwin	K Love
S Barnett	J Love
L Bebb	K and L Low
H Boleyn	G MacKay
G Buckman	S Malone
R Buwalda	F Mason
R and T Buwalda	A Mildon
R Cassells	R Mildon
S Cassells	A Milne
W Christiaans and R Harding	M Nicholls
Dr A Cookson	A Nixon
J Cooper	J Olsson
N Cooper	N Olsson
B and J Dalziel	S and A Paiwai
A Day	B Percy
K and C Dench	J Poff
C Dench	D Pringle
G Devey	R and S Pugmire
G and L Dome	Dr G Rapson
J Dixon	B Rosa
Dr P Dixon	J Rounce
H van der Ende	A Ryan and M Tremain
M Feyen	P Stichbury
Prof Flenley	R Schonewille
J Freebaine	B Stevensen
M Frith	R and M Steward
I and L Fuller	S Stewart
B and J Gawith	A Stewart
A Grassick	C Teo-Sherrell
B Green	P Te Rangi
H Harker	D Thurley
J Harker	K Tippet

R Hayhurst	L Tremain
L Huffman	B Watson and E Watts
B Jackson	J Wheeler
R Jebson	J Whitelock
P Jenkins	B Wilson
G Jordon and J Vanderpool	K Young
H Jones	I Yule

Submitter comments on the Draft Decision and Report:

J Adams	M and T McBride
R Adams	A Mildon
T Adams	R Mildon
M and D Alley	J Milne
L Bebb	D Monaghan
J Bent	New Zealand Wind Energy Association
G Devey	Ngawai Farm
Director General of Conservation	Palmerston North City Council
J Dixon	J Poff
P Dixon	D Pringle
Friends of Turitea Reserve Inc	S and R Pugmire
A Grassick	P Robbie
M Grassick	J and W Scott
N Haack	K and P Sharpe
H Harker	A Shilton
R Harker	M and R Stewart
Horizons Regional Council	P and PK Stichbury
Huatau Marae	S and S Stichbury
L Huffman	Tararua-Aokautere Guardians Inc
A Kells	L Tremain
D Klein	M Tyler
J and S Lang	J Vanderpoel
M Levin & Levin Farming Company	R Voelkerling
J and K Love	S Waters
K and L Low	J Wheeler
K and M Malone	B Wilson

Support Team to the Board of Inquiry:

Erin Alloway	Caroline van Halderen
Mary Goodwin	Kirsty van Reenen

APPENDIX 3: BOARD MEMORANDUM DATED 30 MAY 2011

BOARD OF INQUIRY

Turitea Wind Farm Proposal

IN THE MATTER of the Resource Management Act 1991

AND

IN THE MATTER of a Board of Inquiry appointed under s146 of the Resource Management Act 1991 to consider an application by Mighty River Power Limited for resource consents to construct, operate, and maintain a wind farm at Turitea

MEMORANDUM TO MRP, COUNCILS, AND ALL SUBMITTERS. COMMENTS ON DRAFT REPORT BY MIGHTY RIVER POWER

Introduction

[1] We thank all parties for your comments on the Board's Draft Report. They have resulted in our conclusion that further deliberations may be ongoing for the reasons given below.

Legal Issues

- **Hearing Never Formally Closed**

[2] We accept that the Board has not formally closed the hearing. In the Draft Report we required significant other information from MRP. As a result from all comments on the draft,

we consider there are still some issues and draft conditions outstanding which require a further response from MRP before we close off the final report.

[3] We agree that the definition of the word ‘comment’ in ss148(4) and 149(1)(a) RMA is more expansive than it is in the recent amending legislation (s149Q) (as at 2011) where matters of a ‘minor’ or ‘technical aspect’ of a draft report only may be considered. Under the unamended section, s148(4), the Board may consider ‘any aspect’ of the Draft Report.

- **The National Policy Statement on Renewable Electricity Generation**

[4] We accept that the National Policy Statement (NPS) on Renewable Electricity Generation (May 2011) requires the Board’s re-assessment about aspects of the proposal as if it had been directed to its obligations under the NPS at the time of our initial deliberation. This is a matter of law under s104(1)(b)(i) and will require further comments from the other parties. To this end we accept the content of MRP’s Section Three ‘Request’ included in the ‘Comments’ documents referring to the NPS as well as Mr Henry’s second statement of evidence. As long as due process is followed, these documents may come to the Board as a consent authority under s41(1)(b) RMA which refers to evidential matters under s4(1)(b) of the Commission of Inquiry Act 1908. This Act is incorporated by way of reference within the RMA and states:

[4B Evidence

- (1) The Commission may receive as evidence any statement, document, information, or matter that in its opinion may assist it to deal effectively with the subject of the inquiry, whether or not it would be admissible in a Court of law.

- **Scope**

[5] As to the scope to further amend the application, we agree that MRP’s proposed revised layout in their comments on the Draft Report may be within scope of the present application. We point out the issue arises out of the iterative development process which is not yet fully complete: see *Project West Wind*¹. Further comments need to be sought on this issue from the councils and other interested submitters.

¹ *Meridian Energy Limited & Others v Wellington City Council and Another*. Decision No 031/2007 [Environment Court] paras [460]-584]

- **Natural Justice and Fairness**

[6] MRP identifies in its request, that one of the principal issues the Board must address is the ongoing sustainability and viability implications with respect to the project's scale and configuration as set out in our Draft Report. MRP's proposal is that through this comments process the Board can and should give the parties the opportunity to be heard on a revised layout that the company has prepared to improve the project's sustainability. This is based on the areas of the site indicated within the draft report as being appropriate for the wind farm. Otherwise, MRP suggests, if we do not allow such responses, the Board is breaching the legal principals of natural justice and fairness. Plans indicating MRP's revised layout are attached to its comments document marked Appendix 4.

[7] After deliberation on this issue the Board has decided that:

- the request and comments by MRP, together with the evidence of Mr Henry, are sufficient for the Board's re-assessment of the issues raised by MRP in the light of the evidence it has already given; we do not require further evidence or submissions from the applicant.²
- responses are, however, invited from submitters and councils on MRP's proposed revised layout and the NPS; such responses may be lodged with the Project Co-Ordinator within 14 working days of receiving this memorandum – namely 20 June 2011.

- **Other Matters**

- **Transmission Lines**

A submitter, Mr Shilton, has noted in his comments that potentially there is more favourable transmission line route within the reserve and that he had received a favourable response to this alternative route when he discussed it with Mark Henry. MRP is therefore requested to advise the Board on the feasibility of this alternative route.

In addition, MRP is requested to advise the Board of details of a possible transmission line from Turitea to Puketoi which is referred to in the

² See para 31 of MRP's Request document.

comments received from the McBride family as crossing the southern boundary of their property.

- **Decommissioning**

MRP is also requested to respond to the Board on the request in the comments from two submitters that if for any reason MRP elects to decommission an individual turbine (or turbines) ahead of the decommissioning of the overall wind farm, then within say two years of their decommissioning, these individual turbines should be removed.

Responses on these issues also to be received by 20 June 2011.

We look forward to receiving your further comments.

DATED at Wellington this 30th May 2011



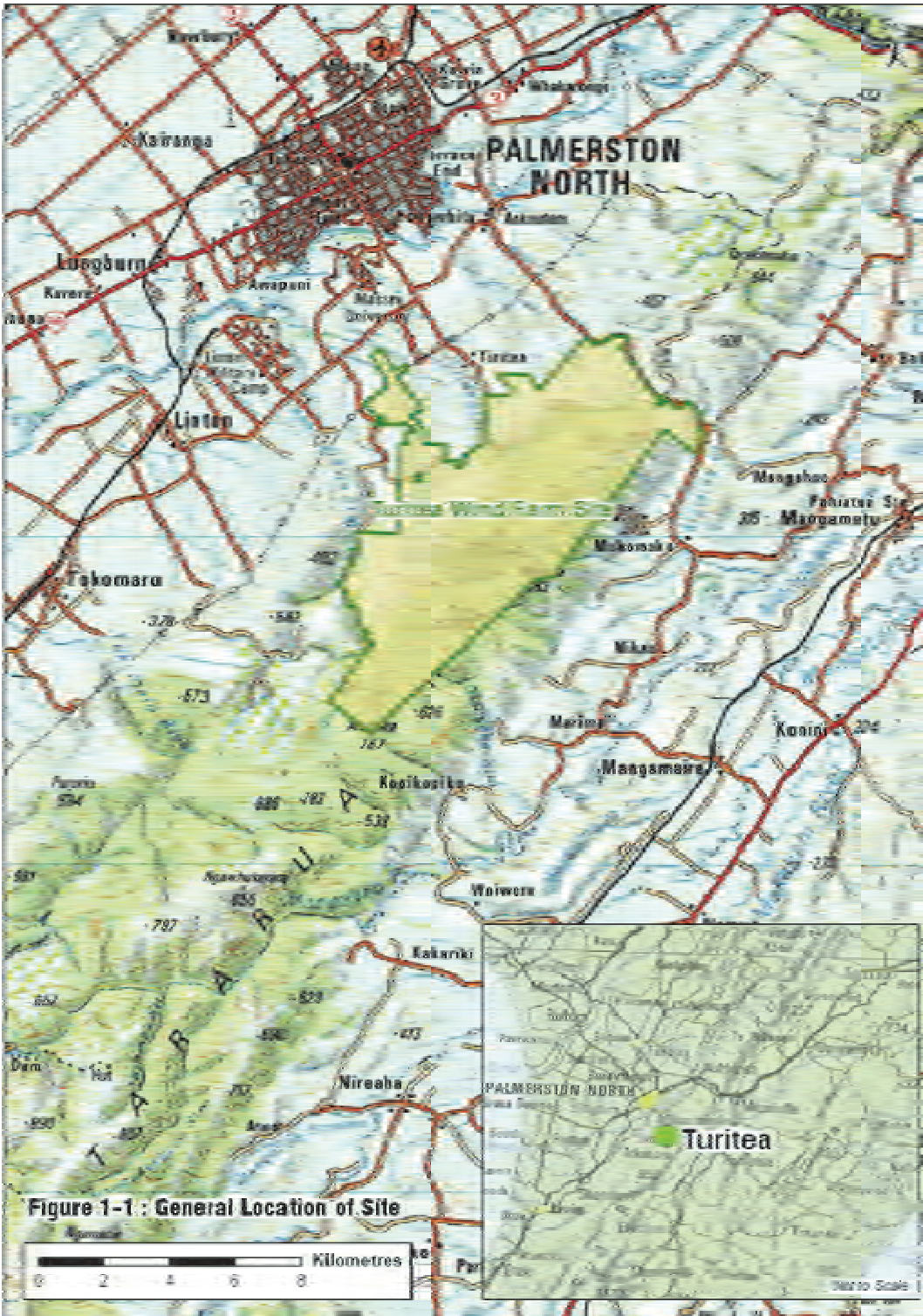
S E Kenderdine

Retired Environment Judge

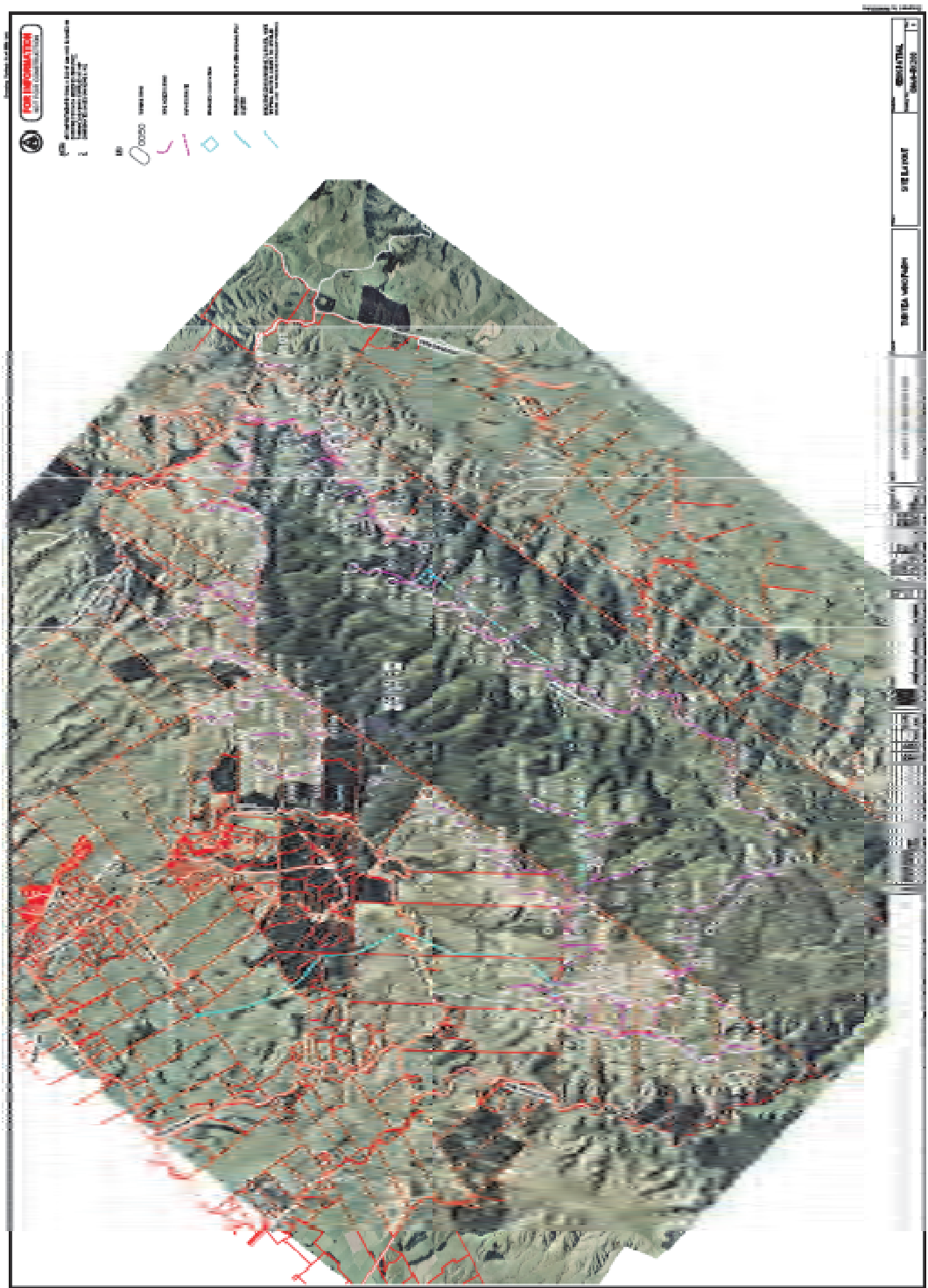
Chair

Turitea Board of Inquiry

APPENDIX 4: LOCATION PLAN

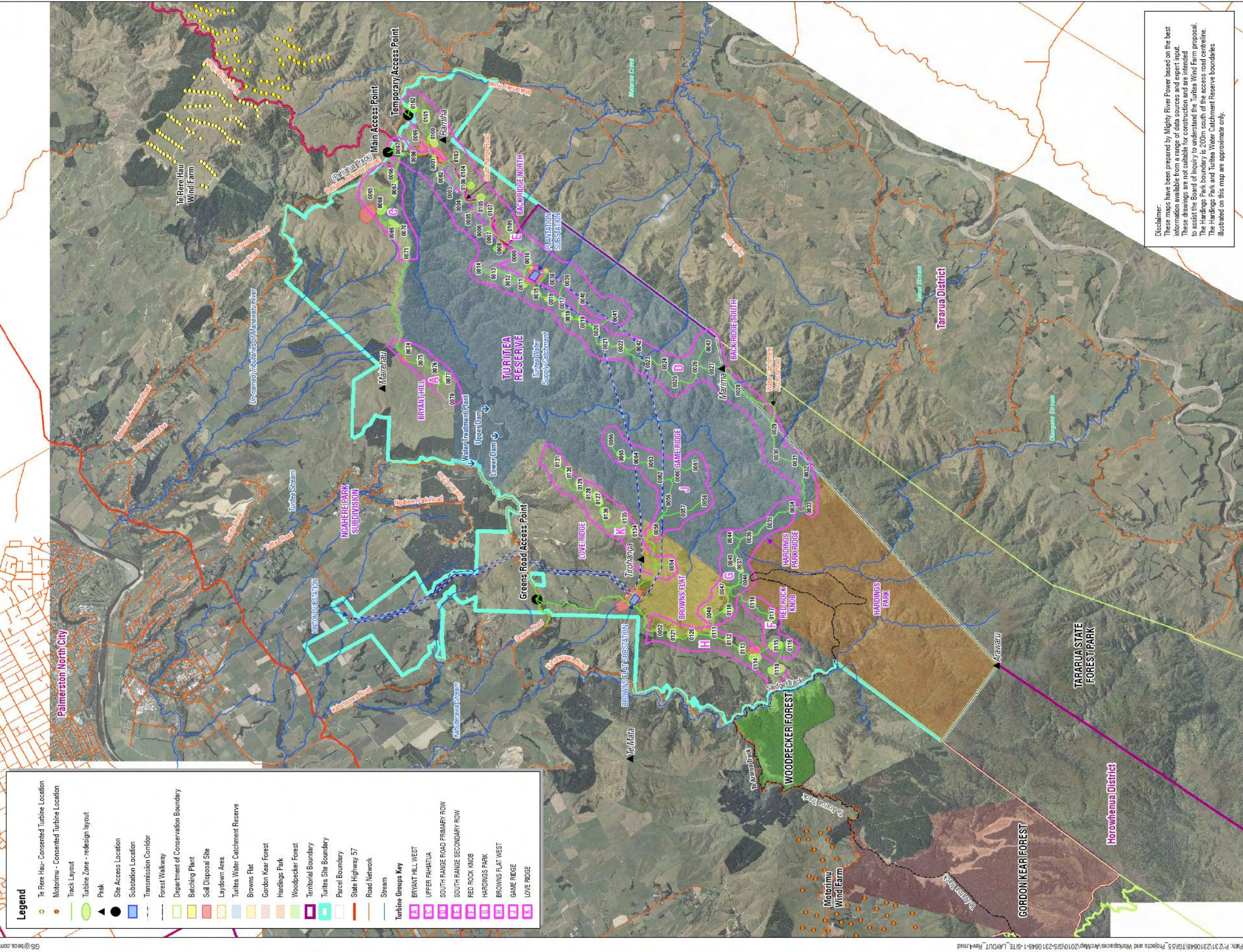


APPENDIX 5: NOTIFIED PROPOSAL



APPENDIX 6: REDESIGN SITE LAYOUT – FEBRUARY 2010

(Drawing No: GIS-2310848-1)

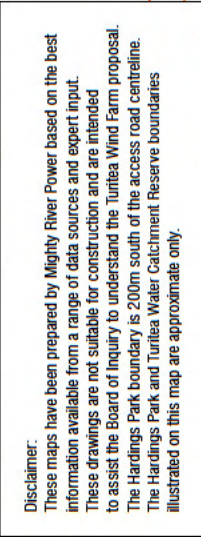


Disclaimer:
These maps have been prepared by Mighty River Power based on the best information available from a range of data sources and expert input. These drawings are not suitable for construction and are intended to assist the Board of Inquiry to understand the Turitea Wind Farm proposal. The Hardings Park boundary is 200m south of the access road centreline. The Hardings Park and Turitea Water Catchment Reserve boundaries illustrated on this map are approximate only.

Scale 1:40,000 at A2

APPENDIX 7: MRP REDESIGN – JUNE 2011

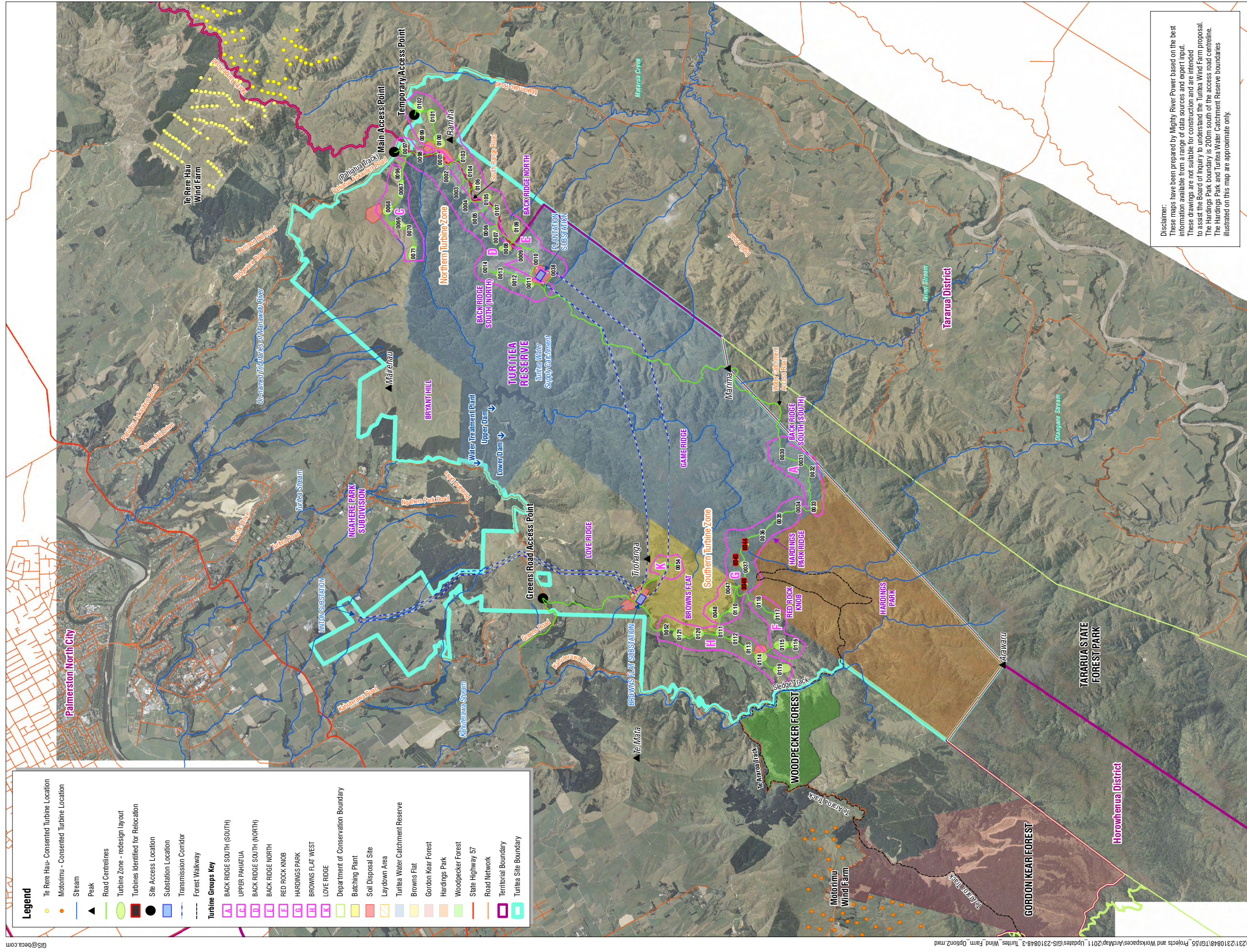
(Drawing No: GIS-2310848-2)



Scale 1:40,000 at A2 <

APPENDIX 8: BOARD DECISION AND APPROVED LAYOUT

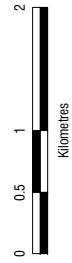
(Drawing No: GIS-2310848-3)



Disclaimer:
These maps have been prepared by Mighty River Power based on the best information available from a range of data sources and expert input. These drawings are not suitable for construction and are intended to assist the Board of Inquiry to understand the Turitea Wind Farm proposal. The Hardings Park boundary is 200m south of the access road cantrelne. The Hardings Park and Turitea Water Catchment Reserve boundaries illustrated on this map are approximate only.

Revision	By	Verified	App'd	Date
Rev 2	LK	SRW	DRAFT	12/08/11
Rev 1	LK	SRW	DRAFT	28/07/11

Scale 1:40,000 at A2



<i>Client:</i>	 MIGHTY RIVER POWER		<i>Discipline:</i>	GIS
<i>Project:</i>	Turtee Wind Farm		<i>Drawing No:</i>	GIS-2310848-3

Turitea Wind Farm
Board's Draft Decision (Option 2)

MIGHTY RIVER POWER

$$z \rightarrow$$

Project: **Turitea Wind Farm**

Discipline:

Drawing No:	

GIS-2310848-3

