

**BEFORE THE PALMERSTON NORTH CITY COUNCIL**

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UNDER

The Resource Management Act  
1991 (RMA)

AND

IN THE MATTER

of a review under s 128(1)(c) of the  
conditions of consent applying to  
the TRH, North Range Road,  
Palmerston North

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**SECTION 42A REPORT BY CRAIG AUCKRAM**

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Dated: 18 August 2017

**Terms**

<b>TRH</b>	Te Rere Hau Windfarm operated by NZWL, consented in 2005.
<b>TRHE</b>	The Eastern extension of the TRH located in the Tararua District, consented in November 2009.
<b>NZWL</b>	New Zealand Windfarms Ltd, the consent holder.
<b>Turitea Windfarm</b>	Approved wind farm consent on the Turitea Reserve. Presently not constructed.
<b>MDA 2014</b>	Marshall Day Acoustics Report 2014 - RP008R03 2011 095W. The wind farm noise data collection specification compiled for NZWL.
<b>PNCC</b>	Palmerston North City Council
<b>PC15</b>	PNCC Plan Change 15 review of the Rural Zone.
<b>WTGs</b>	Wind Turbine Generators
<b>SACs</b>	Special Audible Characteristics

**Council Bundle**

[1] The background to this matter is lengthy. The Council has compiled, in distinct parts, background material that may be relevant to this hearing. The parts contain materials that have common features. An index with hyperlinks is provided. Not all of the materials are relevant to the scope of issues that the Council identifies as relevant. However, the Council is conscious that many of the residents are non-expert and do not have access to the resources to refer to this information alone. Ensuring the bundle is extensive may assist residents and hopefully will avoid unnecessary duplication of

material. The bundle is referenced as Council Bundle and the acronym CB is used.

- [2] Part 6 of the Council Bundle contains various maps that are referred to throughout my report.
- [3] The Council Bundle includes materials requested by the Council's technical experts.

#### **Technical experts**

- [4] To assist the hearings panel, the Council has requested reports from two acoustic experts as follows:
  - (a) Tom Evans – acoustic consultant, Melbourne, in relation to the proposed conditions in the Notice of Review and evidence in relation to the submissions filed by submitters; and
  - (b) Nigel Lloyd – acoustic consultant, Wellington, in relation to the background to PC15 and the rural-residential overlay in the Rural Zone of the Palmerston North District Plan.

#### **Introduction**

- [5] My full name is Craig Laurence Auckram. I am a senior planner (Compliance and Resolutions) with responsibilities with the Palmerston North City Council (the Council).
- [6] I have a Bachelor of Regional Planning and I have over 20 years experience as a consulting planner in the public and private sectors.
- [7] As part of my role I have been responsible for addressing issues that have arisen in relation to the maintenance and operation of the wind farm known as TRH. This is located at North Range Road, Palmerston North on the Tararua Ranges adjacent to Pahiatua Aokautere Road (known locally as the Pahiatua Track) that carries traffic between the

Manawatu and Wairarapa. I have been involved in enforcement action and monitoring related to the TRH since 2011 and where necessary provided affidavits and evidence to the Environment Court in relation to proceedings concerning the TRH.

[8] I have read the historical files and am generally familiar with the background to the consenting, construction and operation of the TRH.

[9] I have read the code of conduct for expert witnesses in the Environment Court Practice Note 2014. I agree to comply with the code of conduct. This evidence is within my area of expertise except where I state I am relying on what I have been told by another person. I have not omitted to consider material facts known to me that might alter or detract from the opinions that I express.

#### **Notice of application for review**

[10] This report relates to a hearing in respect of an application for review issued under RMA, s 129 as a result of circumstances stated in s 128(1)(c). These circumstances are inaccuracies in the application for consent for the TRH that materially influenced the decision made on the application.

[11] The Environment Court found in its first declaration at [2012] NZEnvC 133 that s 128(1)(c) applied to the TRH because of the inaccuracies in the assessment of effects in the Noise Assessment Report attached to the AEE. At [132] of that decision, the Environment Court held:

We are therefore satisfied that the Council is entitled to exercise the power of review of conditions contained in s 128(1)(c) if it so determines. We make the following declaration:

That the acoustic information supplied in the AEE by the respondent and the evidence of the respondent was inaccurate to such an extent that Palmerston North City

Council may rely on s 128(1)(c) RMA to conduct a review of the noise consent conditions applicable to the TRH.

[12] The Environment Court also made a declaration that Condition 1 of the consent for the TRH was not complied with. This was because the Noise Impact Assessment Report determined a sound power level of 100.7 and the sound power level that the wind turbine generators (WTGs) were emitting was 105.7. In respect of this declaration, an appeal was lodged by New Zealand Windfarms Ltd (NZWL) that made its way to the Court of Appeal. What was not in dispute was that a notice of review under s 128(1)(c) could be issued. Indeed, NZWL's argument to the Court of Appeal was that the review process was the correct process to address the issue not Condition 1. This is noted in the Court of Appeal decision.

[13] NZWL succeeded in its argument in the Court of Appeal and, at the conclusion of that litigation, the Council addressed the nature and extent to which a review would be undertaken in accordance with the relevant provisions of Part 6 of the RMA.

#### **Preparation of the notice for review**

[14] I have managed the process in relation to the preparation of the notice for review. The objectives were the following:

(a) To obtain independent expert evidence in relation to an appropriate suite of conditions that can be applied to the TRH consent so that:

(i) Noise limits and penalties for SACs were imposed so that the noise emissions did not unreasonably detract from the amenities of neighbouring properties; and

(ii) Subject to (i), the consent was governed by the most contemporary New Zealand Standards

(NZS6808:2010) relating to wind farm noise measurement and monitoring.

- [15] The assessment of the matters addressed in the objectives related to a highly technical field. It also required some engagement with NZWL on the basis that it had experience in relation to the operation of the facility and had throughout the process engaged acousticians relating to the effects of the activity.
- [16] Detailed information was compiled through extensive monitoring of the wind farm pursuant to a Data Collection Specification agreed to between the Council and NZWL at an early stage in the declaratory proceedings. The final report was prepared by Mr Halstead of Marshall Day Acoustics dated February 2014 and is referred to in this report as “MDA 2014”.
- [17] For the review process, the Council decided it was desirable to collaborate with NZWL in relation to the following matters:
- (a) The appointment of an independent, well qualified, non-resident acoustic expert;
  - (b) The scope of the review;
  - (c) The provision of information;
  - (d) The content of the review reports, including recommended conditions; and
  - (e) The appointment of a hearings panel.
- [18] For that purpose, the Council entered into a memorandum of understanding (MOU) that provided for that collaboration dated 17 August 2016. The MOU preserved in all respects the Council’s independent role as regulator, and I am satisfied that process has been conducted in a robust and independent manner.

- [19] The Council appointed Tom Evans of Resonate Acoustics from Australia, to review the background material and provide a report including a recommended set of conditions. The first report was dated 27 October 2016. It is attached to the notice of review subsequently issued by the Council dated 2 May 2017. “Resonate RP1”.<sup>1</sup>
- [20] Resonate RP1 is a comprehensive discussion of the Windfarm noise monitoring and the noise criteria considerations. There is no need to set out the contents of that report in this report.
- [21] Resonate RP1 was sent to NZWL for comment. This resulted in some feedback from Marshall Day Acoustics. Mr Evans responded to those matters by letter dated 15 March 2017 (Resonate RP2). This considered the following topics:
- (a) Wind speed threshold for the secondary noise limit;
  - (b) Application of penalties for special audible characteristics (SACs);
  - (c) Alternative assessment of SACs; and
  - (d) Data exclusions.
- [22] As a result of these reports, the Council prepared a draft notice of review and consulted on it with NZWL. That notice of review contemplated public notification and a new suite of conditions corresponding to the recommendations in RP1.
- [23] NZWL queried the need for public notification and also proposed modifications to some of the conditions. Further wording changes were made as a result of that consultation. There was a high level of agreement and NZWL generally supported the review conditions.

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<sup>1</sup> CB Part 1, No. 1.6, p 0317.

[24] By the end of that consultation process the primary differences between NZWL and the Council related to the threshold for the secondary noise limit. The cut-off threshold proposed by Mr Evans was 8 m/s, whereas the cut-off threshold proposed by Mr Halstead of Marshall Day was 6 m/s. These two experts were asked to confer and the Council was advised that following that conferencing Mr Evans remained of the view that the threshold that he recommended was appropriate.

[25] At the conclusion of this consultation process, the Chief Executive of the Council issued a notice of review. At that point in time, I had prepared a notification assessment in accordance with Part 6 of the RMA and reached a conclusion that the application should be fully publicly notified. The notice of review is dated 2 May 2017. The notice of review was publicly notified. The notice of review and notification assessment are included in Part 1 of the Council bundle of documents.<sup>2</sup>

### **Submissions**

[26] A table of the submissions received and the submissions are in CB Part 2.

[27] An aerial photograph of the site and its environs and the location of these submitters is shown in Part 6 of the Council bundle of documents.<sup>3</sup>

### **Considerations relevant to a review and the scope of powers under a review**

[28] The following matters are set out in RMA, s 131 as matters that must be considered in respect of a review

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<sup>2</sup> CB Part 1, No. 1.1, p 0001.

<sup>3</sup> CB Part 6, No. 6.66, p 1615.

**131 Matters to be considered in review**

- (1) When reviewing the conditions of a resource consent, the consent authority—
  - (a) shall have regard to the matters in section 104 and to whether the activity allowed by the consent will continue to be viable after the change; and
  - (aa) in the case of a review under section 128(2), must have regard to any reasons that the court provided for making the order requiring the review; and
  - (b) may have regard to the manner in which the consent has been used.

[29] Section 131, RMA cross-references s 104. The relevant part of s 104 reads:

**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 environmental standard;
    - (ii) other regulations;
    - (iii) a national policy statement;
    - (iv) a New Zealand coastal policy statement;
    - (v) a regional policy statement or proposed regional policy statement;
    - (vi) a plan or proposed plan; and
  - (c) any other matter the consent authority considers relevant and reasonably necessary to determine the application.

[30] In terms of s 104(b) I consider that the following planning documents are relevant:

- (a) The National Policy Statement on renewable energy;
- (b) Part 1 of the One Plan which is the regional policy statement section of the One Plan; and
- (c) The Palmerston North City District Plan.

- [31] In terms of effects, the effects that are relevant are both positive and adverse.
- [32] In this review, the adverse effects that are of particular relevance are those that are other or further than those contemplated by the Assessment of Environment Effects, and in particular the noise impact assessment. All other adverse effects were considered and contemplated in the grant of consent and therefore do not feature as material adverse effects in this review process. As a review process, it is not appropriate to re-litigate the entire consent.
- [33] Under a review the scope of decisions is set by s 132 RMA. That section provides:

**132 Decisions on review of consent conditions**

- (1) A consent authority may change the conditions of a resource consent (other than any condition as to the duration of the consent) on a review under section 128 if, and only if, 1 or more of the circumstances specified in that section applies.
- (1A) Sections 114(4) and 116A apply with all necessary modifications if a regional council decides to do a review and as a result of the review intends to change a condition of a coastal permit and it is required by section 128(3) to give notice of the intended review to the chief executive of the Ministry of Fisheries.
- (2) Sections 106 to 116 (which relate to conditions, decisions, and notification) and sections 120 and 121 (which relate to appeals) apply, with all necessary modifications, to a review under section 128 as if—
- (a) the review were an application for a resource consent; and
- (b) the consent holder were an applicant for a resource consent.
- (3) A consent authority may cancel a resource consent if—
- (a) it reviews the consent under section 128(1)(c); and
- (b) the application for the consent contained inaccuracies that the consent authority considers materially influenced the decision made on the application; and

- (c) there are significant adverse effects on the environment resulting from the exercise of the consent.
- (4) A consent authority may also cancel a resource consent if—
  - (a) it reviews the consent under section 128(2); and
  - (b) there are significant adverse effects on the environment resulting from the exercise of the consent.

[34] The scope of the decision making power is therefore first and foremost to set conditions as if the decision maker was sitting on an application for resource consent. This power to set conditions is contained in s 108 RMA and is not constrained by the scope of submissions or the scope of review. The decision maker has the power to set conditions that the decision-maker considers appropriate, necessary or reasonable. These conditions should be aimed at the effects of the proposal having regard to those effects that have prompted the review. In this case, those are the adverse effects associated with noise emissions that are other or further than those contemplated by the original application.

[35] Section 132 RMA provides the power in respect of a s 128(1)(c) review the power to cancel consent. There are three pre-conditions in s 132(3) before a consent can be cancelled. The first two indisputably apply here. The third pre-condition is that the effects on the environment are significant. Even if these pre-conditions are met, there is a discretion whether to cancel consent and that discretion should be informed by the relevant matters in s 104.

#### **Site and environmental context**

[36] The site is located on North Range Road and is in the section of the Tararua Ranges that is bordered by the Manawatu Gorge in the north east and Pahiatua Aokautere Road (the Pahiatua Track) in the south west. The Tararua Ranges form a backdrop to Palmerston North City.

This section of the Tararua Ranges is approximately 12.5 km long and the length taken up by the TRH is approximately 1.3 km. TRH is approximately 11 km from the centre of Palmerston North in a south easterly direction. The elevations at this point drop from the higher elevations of the State Forest Park that commence around Hardings Park and Kaihinau. This section of the Tararua Ranges extends to the Manawatu Gorge. This gorge is a naturally formed waterway through which the Manawatu River passes. Its particular feature is that it is one of the few rivers in the world where the headwaters are located on one side of a range - the Ruahines – but passes out to sea on the other side of the range. i.e. the West Coast. Heading north the next range is the Ruahine Ranges. In this locality between Hardings Park and Wharite Peak there are numerous consented and existing wind farms. That is because in this natural low elevation between the ranges, a funnelling effect is created with the prevailing westerly which means that there is a significant wind resource in this locality.

[37] The WTGs that make up the TRH are different than those used in other wind farms that tend to be European models such as Vestas and Siemens. The TRH WTGs are a manufactured product by the Christchurch manufacturer Windflow Technologies Ltd and the model is known as the Windflow 500. This is a two bladed WTG. All other WTGs on other wind farms in this region have three blades. The major site at which the Windflow 500 model is installed is Palmerston North. But for some incidental sales in Scotland, I understand that the Windflow 500 does not have significant market penetration. Initially, NZWL was part of the manufacturer of the Windflow 500, but the wind generation component of the business was separated off on or about 2005 and NZWL was a separate business listed on the New Zealand Stock Exchange.

[38] The consent granted in 2005 following mediation in the Environment Court (that the notice of review addresses) provides for a total of 97

WTGs to be constructed in four stages. Stage 4 comprising 32 WTGs has not been constructed.<sup>4</sup>

- [39] Some communications from NZWL indicated that Stage 4 will not be constructed. In view of the current marginal levels of compliance with the existing consent conditions, it is uncertain whether Stage 4 could comply with the present or proposed noise limits. However, the Notice of Review issued by the Council does not foreclose the option of Stage 4 if the requirements at the receiver locations are met.
- [40] The topography around the site is complex. The landscape has many undulations in the form of gullies, ridges and terraces that are typical of this area and the foothills of the Tararua Ranges.
- [41] Despite the strong wind run, rural-residential living in this locality has had an appeal for some residents of Palmerston North. Further to the south there is quite extensive development adjacent to the Turitea Valley in the subdivision known as Ngahere Park. Similarly, in the locality of the TRH a number of residences have been constructed. In many cases the allotments predated the TRH and many of the residences in Pahiatua Track and on Ridge View Road and Harrison Hill Road were constructed or under construction in 2005. Later, Kingsview Park was established and this has seen progressive development since 2005. To the north of the TRH, there is a road called Forest Hill Road, off SH 57 that extends into the foothills of the Tararua Ranges. There is a cluster of houses at the top of this road that are directly beneath the TRH.
- [42] Therefore, around the perimeter of the TRH and beyond there is a pattern of rural residential activity that has developed before and after the TRH was consented.

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<sup>4</sup> CB Part 1, No. 1.22, p 200.

[43] At the first instance hearing before the Council, the commissioner was Mr Aburn - see CB Part 4, No. 4.40, p 361. His decision dated 11 February 2005 records the range of submissions received in respect of the proposed wind farm that was stoutly opposed by a significant number of residents. It is noteworthy that subdivision was contemplated on a range of other properties close to the wind farm, including the proposed County Heights subdivision.<sup>5</sup> Since the notified 2015 Plan Change 15 by the Council, further rural subdivision within 1.5km of a wind farm is a non-complying activity in order to protect the operations of existing wind farms. For that reason, further patterns of development close to the TRH of the type that has been seen in the past is not anticipated and therefore should not be included within the notional receiving environment for the purpose of assessment of effects. I have checked whether or not there are any existing unimplemented subdivision consents in the locality that may affect the nature of the receiving environment applying the decision of the Court of Appeal in *Hawthorne v Queenstown Lakes District Council*, but there are none that I am aware of.

[44] Part 6 of the Council Bundle contains maps detailing:

- (a) A map showing the location of submitters who gave affidavits in the first declaration proceeding in 2012;<sup>6</sup>
- (b) The location of the existing WTGs in TRH;<sup>7</sup> and
- (c) The reference sites proposed in the notice of review;<sup>8</sup>

[45] I also have prepared a map that shows the location of wind farms that are existing or consented on the Tararua and Ruahine Ranges immediately adjacent to Palmerston North.<sup>9</sup>

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<sup>5</sup> See Aburn decision CB Part 4, No. 4.40, p 361 at [164] *et seq* p 1384 – 1385.

<sup>6</sup> CB Part 6, No. 6.61, p 1602.

<sup>7</sup> CB Part 6, No. 6.61, p 1602.

<sup>8</sup> Part 6, No. 6.61, p 1604.

### History of complaints

- [46] The Council has received over 1700 complaints from residents in relation to the TRH. It receives very few, if any, in respect of any other wind farm. From the evidence that was provided in the Environment Court hearings, it is plain that a number of residents with technical skills were particularly active in providing complaints and there was acceptance in the community that they would provide a significant role in making the Council aware of this issue. These people included Mr R.C. (Clel) Wallace and Ms Huffman Devey.
- [47] As part of the declaratory proceedings the Council obtained affidavits from 17 residents as to their experience with noise issues from the TRH. These are compiled in Part 5 of the Council Bundle.
- [48] Submissions received also confirm that these types of effects continue to be experienced by residents.
- [49] From time to time NZWL has characterised the source of complaints as being from a limited number of individuals that have become overly sensitised to wind farm noise. However, the population sample is sufficiently great and the descriptions of the noise effects sufficiently consistent that the Council considered that there was a real issue to be addressed.
- [50] The consent did not contain a review condition. In addition, there was limited means by which the Council could require additional monitoring to assess effects.
- [51] The Council decided to use the affidavits in support of an application for declarations for the Environment Court. As stated earlier, this resulted in agreement to compile data that demonstrated better the nature of the extent of the TRH acoustic emissions.

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<sup>9</sup> Part 6, No. 6.67, p 1610.

- [52] With the passage of time, the number of complaints have declined. This may be attributable to the pedestrian progress made on addressing the complaints already lodged.

**The TRH noise emissions generally**

- [53] The TRH has WTGs that produce noise at a sound power level in the order of 5 dBA more than originally certified in the resource consent.

- [54] During the course of evidence in the First Declaration, it was ascertained from the evidence of the then Chief Executive of NZWL, Chris Sadler, retrofitting had been undertaken in the form of “rubbers”. How and to what extent this affected all or some of the WTGs noise emissions is unknown.

- [55] Most residents were told before the application was made that the noise effect on them would be nil, or less than or equal to 30 dBA. As a result of the increase in sound power level demonstrated by the measurements of sound in MDA 2014 (and the terrain factor discussed below), some of these residents experienced noise in the order of 40 dBA based on measured sound levels. This, because of the logarithmic scale of noise measurement, means that residents are perceiving sound to be more than twice as loud as the sound level that was predicted at the time consent was granted. The difference in sound power level only accounts for 4-5 dBA of the measured 10 dBA difference between prediction and measurement. The remaining difference is, as I understand it, attributable to deficiencies in the terrain attenuation calculations in the NIAR. In particular, the points of reference for prediction were located in the gully between Harrison Hill and Ridgeview Roads, approximately 30 metres below the dwellings on the nearby ridges.

- [56] The annoyance level does not appear to be consistent and varies amongst properties and depends on different wind conditions. For

example, I have spoken to a neighbour that lives on Harrisons Hill Road and he says that he only hears low level noise from TRH and when he goes inside he doesn't hear any noise. Harrisons Hill Road is closer to the wind farm than Ridgeview Road. Because of the erroneous prediction in the original noise assessment report, many of the properties experiencing effects were not properties that were subject to background sound assessments at the time the AEE was prepared. This is because, based on NZS 6808:1998, they were outside the anticipated 35 dBA threshold which would have triggered the requirement for background sound testing.

[57] Under the Data Collection Specification, background sound levels were obtained for a number of properties now affected (six in total) and the data and the scatter plots for those properties in MDA 2014 indicate low background sound conditions at certain low wind thresholds. The inference that has been made is that it is in those conditions where background sound levels are lowest when the potential noise effects are most annoying.

[58] Because of the nature of the complaints, the Council had a suspicion that the WTGs were also producing SACs. SACs are defined in NZS6808:1998 as characteristics of wind turbine noise that are not normal and have the potential to increase annoyance. SACs come in three categories:

- (a) Tonality;
- (b) Amplitude modulation; and
- (c) Impulsivity.

[59] As part of the Data Collection Specification, the Council requested data on the measurement of tonality in accordance with IEC-61400. This analysis demonstrated that the claim in the Noise Impact

Assessment Report that the WTGs did not possess SACs was incorrect. The tonality levels from the sample references in 2014 were described by the Melbourne based consultant called by the Council in the second declaratory proceeding, Mr Reutersward, as being “*higher than those of any turbine he had worked with*”.<sup>10</sup>

[60] The original conditions of consent were uncertain in their meaning as to whether or not the presence of SACs was controlled by the conditions based on near field measurement or far field measurement. In the second declaratory judgment, the Environment Court held that the conditions were unable to be given a sensible meaning and therefore were invalid.<sup>11</sup> This meant that there were no controlling conditions on SACs.

[61] NZWL always argued that SACs are measured at the receiver location and that penalties are incurred in accordance with the New Zealand Standard if measurements revealed the presence or absence of those SACs measured in accordance with that standard with a preference for objective measures. This, NZWL argued, was more consistent with the effects based approach of the RMA and the effects based focus of the New Zealand standard.

[62] The Council’s concern was that NZS6808:1998 and NZS 6808:2010 both contemplated WTGs that were installed, maintained and operated without known SAC characteristics. So that SACs even measured at the near field were an uncommon characteristic of the WTG class and were a result of unusual events. In reality, the Windflow 500 is always producing SACs and, but for masking, these characteristics would be expected in

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<sup>10</sup> CD Part 1, No. 1.4, p 261 – 262 at [14].

<sup>11</sup> CB Part 1, No. 1.4, p 276 at [62].

the receiver location.<sup>12</sup> The concern was that neither the standard and its monitoring regime, or the penalty regime was sufficient to address this situation. This concern was also compounded by the fact that the objective measures used were based on Scandinavian referenced measures that were not, as I understand it, specifically developed for this type of situation.

[63] It is the complexity of this situation, in particular, that justified the need for independent expertise in relation to the setting of conditions to manage this situation as it is such a complex technical subject.

#### **Management of noise in other wind farms in or around Palmerston North**

[64] The Manawatu has the largest number of wind farms in the country and the Council has some experience in relation to the management of noise from wind farms.

[65] As stated, other than in relation to TRH, the existing wind farms have not presented any problems and have been assessed, constructed and monitored in accordance with the former NZS6808:1998.

[66] Before the global financial crisis in 2007, there was quite a gold rush towards the use of wind resources in New Zealand with the consequence that there were a number of applications processed between 2004 and 2010 for the use of resources close to Palmerston North. These included the TRH, the Motorimu Windfarm and the Turitea Windfarm. The Motorimu Windfarm consent has lapsed and the Turitea Windfarm is not yet constructed.

[67] The Turitea Windfarm is on the opposite side of the Pahiatua Track from TRH. In addition, NZWL operates a wind farm on the eastern side of the Tararua Ranges.

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<sup>12</sup> Joint Acoustic witness Statement at [22], p 1650. CB Part 7, No. 7.78, Joint Statement of Acoustic Experts.

[68] The Turitea Windfarm was consented by a Board of Inquiry and at that time it was aware of some issues in respect of SACs in respect of a wind farm west of Wellington at Makara. It was also aware of issues developing in relation to TRH. The Board of Inquiry decision has very strong conditions in relation to noise, including:

- (a) Certification that sound levels comply with the levels used in the prediction of noise in the AEE;
- (b) Certification the WTGs do not possess SACs at the time of installation;
- (c) Cumulative effects management; and
- (d) High amenity thresholds.

[69] The relevant parts of those conditions from the Turitea Board of Inquiry are attached at Part 10 of the CB, No.10. 88, Conditions 18-52 at pp 2580 – 2591.

[70] The conditions imposed by the Board of Inquiry are significantly more sophisticated than those in the existing consent for TRH and reference the current standard NZS 6808:2010. The greater level of sophistication in the conditions of consent reflect the improved understanding of wind farm noise.

#### **PNCC District Plan Change 15 (PC 15)**

[71] The Council as part of its statutory review of the District Plan reviewed those sections of the District Plan relating to landscapes, rural subdivision and wind farms. The package of reviewed sections was promulgated under the umbrella of PC15 and comprised the following plan change elements:

- (a) Rural Zone and rural subdivision;

- (b) Wind farms and landscapes;
- (c) Boundary change area;
- (d) Flood hazards;
- (e) North East Industrial Zone and extension area;
- (f) Utilities; and
- (g) Airport Zone.

[72] The package of provisions had some elements that were relevant to the consenting and re-consenting of existing wind farms and the management of land uses around wind farms. In the context of re-consenting wind farms it was identified that existing wind farms, in particular early ones such as Tararua 1, Tararua 2 and Tararua 3 were coming to the end of their economic and engineering life and would be replaced by more modern technology. This is known as repowering.

[73] So far as land use is concerned, PC15 identified areas - by means of a Rural-Residential Overlay - that are intended to provide for future rural-residential use in the Rural Zone. That Rural-Residential Overlay at the time of notification extended over much of the apron of rural-residential activity in the Aokautere and Pahiatua Track area, including adjacent to the TRH. However, it did not include both sides of Ridgeview Road. (See Map Series at CB Part 6, No. 6.71 – 6.75, pp 1620 – 1624.

[74] In respect of the Overlay - the Council's acoustic consultant, Nigel Lloyd, recommended that areas with the Rural-Residential Overlay should be identified as high amenity areas for the purpose of NZS 6808:2010. The first generation PNDP did not identify such areas in accordance with the Standard because it predated NZS6808:2010

and NZS6808:1998. For wind farms pre-dating PC15, an evaluation of whether or not a high amenity threshold should be applied was gauged based on:

- (a) The patterns of land use in the locality and the realistic levels of noise anticipated as a result of rural production;
- (b) The extent to which the existing locations enjoyed a high level of amenity by reason of low background sound; and
- (c) The extent of rural-residential activity anticipated in this locality as opposed to rural production with potentially lower levels of background sound.

[75] PC15 also introduced rules providing a 1.5km setback from existing wind farms where subdivision is a non-complying activity to manage reverse sensitivity effects. The objective is to avoid further residential and development and land use intensification close to wind farms.

[76] The Council's acoustic consultant, Mr Lloyd, gave evidence in support of the high amenity recognition for land within the Rural-Residential Overlay and the Commissioners that released their decision agreed with that approach. This high amenity recognition is now effectively operative and beyond appeal.

[77] The rural-residential overlay as notified near TRH was in part within the 1.5km setback and NZWL argued that the rural-residential overlay should not apply in areas where the 1.5km setback applied. The Commissioners agreed with that view. The consequence is that some of the land formerly notified in PC15 as within the rural-residential overlay is no longer within that overlay. This affects principally the County Heights Road development as shown in CB Part 6, Map No. 6.73, p 1622.

[78] In the proposed conditions, the high amenity standard is proposed to apply to all properties in existence at the time consent was granted that are within the Rural-Residential Overlay as notified in PC15. The reason for that is:

- (a) These properties are largely indistinguishable in terms of their background sound levels;
- (b) The patterns of development are rural-residential in character;
- (c) The properties are unlikely to experience significant noise associated with rural production and residents confirm this; and
- (d) But for the 1.5km setback, which is a forward looking provision, all of these properties would be identified as high amenity areas based on Mr Lloyd's methodology. The 1.5km setback and its impact on the extent of the rural-residential overlay, is a forward looking planning regime not intended to influence the assessment of the specific issues relating to this review of conditions.

[79] One of the submitters is the Irvins on the northern side of Ridge View Road. Their dwelling was also in existence at the time TRH was consented. Neither the houses on Harrison Hill Road nor the houses on the northern side of Ridge View Road were within the rural-residential overlay for PC15 as not notified and therefore will not benefit from the proposed high amenity condition in Condition 4 of the reviewed conditions. On reflection, because the characteristics in (a) – (c) in the previous paragraph also apply to these properties, consideration should be given to adding those properties on the northern side of Ridge View Road that will benefit from the high amenity noise threshold.

- [80] The suite of provisions in Chapter 9 of the District Plan, including the cascade of objectives and policies, enable appropriate re-consenting and development of wind farms and thereby gives effect to the One Plan and the National Policy Statement of renewable energy.
- [81] All wind farms are expected to have their noise assessed, monitored and operated in accordance with the expectations of NZS 6808:2010. In this respect, that standard remains the dominant source of guidance in relation to the management of acoustic effects. As I have stated earlier however, that document requires that WTGs are designed so as not to possess SACs and therefore there are elements of TRH that do not fit easily with some base assumptions that NZS 6808:2010 makes.

#### **Major features of the reviewed conditions**

- [82] Attached to the notice of review (see CB Part 1, No. 1.1) at Schedule 1 are the review conditions proposed by the Council at the time it issued the notice of review. These conditions are subject to the submission process and any further information obtained during the course of the review process.
- [83] The amendments to the existing conditions are identified by underlining. The exception is the review clause in clause 21 that is new but has not been underlined.
- [84] The major features of the change are the following:
- (a) Condition 4 introduces the secondary noise standard of 35dB(A) or background sound level +5dB(A). This applies up to wind speeds as measured at the wind farm location up to 8 m/s. This applies to properties within the rural-residential overlay as mapped in the notified version of PC15;

- (b) But for Condition 4, the noise limit is 40dB(A) or background sound level +5 under new Condition 4;
- (c) In setting limits, the background sound level should not include noise from the TRH extension under Condition 6;
- (d) Condition 7 sets a slightly modified methodology for measurement of noise and in particular identifies data points to be excluded from assessment;
- (e) Condition 8 specifies procedures for assessment of noise levels where there are SACs. There is a specific tonal assessment methodology at Condition 8.1 and Condition 8.2 that applies an objective method for assessing when a penalty will apply for amplitude modulation. Conditions 8.4 and 8.5 set thresholds for the percentage of data points in any wind speed bin that will trigger the assessment of wind farm noise levels;
- (f) Condition 10 specifies the six locations identified in the data collection specification as reference sites and Condition 10.2 specifies the methodology for identifying alternative locations where representative locations cannot be accessed;
- (g) Condition 10.3 identifies that any objective assessments of tonality and amplitude modulation must be included in the compliance report;
- (h) Condition 10.6 requires that any mitigation measures required to achieve compliance with the conditions of consent must be documented and the consent holder must demonstrate how those steps will be carried out in the continued operation of the wind farm;

- (i) Condition 12 sets some rigorous steps to be taken before Stage 4 is constructed. To ensure there is no repetition of the past, any predicted noise levels using NZS 6808:2010 will rely on determined sound power levels and those sound power levels used for the prediction cannot be exceeded; and
- (j) Condition 13 requires an annual report specifying any changes to the WTGs and any issues that arise that may be relevant to the reliability of existing information regarding the noise effects of the wind farm.

[85] A number of the conditions relate to technical matters outside my expertise, but the following matters are relevant to my experience in relation to the monitoring and enforcement.

- (a) Condition 10.6 is important because whether or not the high amenity threshold is 6 m/s as contended for by NZWL, or the higher level of 8 m/s or something else, it is necessary for the Council to understand from any compliance report how the wind farm is being managed operationally to achieve those standards. I understand that there are technologies and techniques to manage wind farm noise and these, if deployed to achieve compliance, must be specifically identified to ensure future compliance and appropriate regulatory oversight. In the past, limited information on this topic has been provided by NZWL, and even now its experimental changes to operating protocols have not been disclosed to the Council;
- (b) The technical problems with the WTGs were a concern of submitters at the original consent hearing largely because of the catastrophic failure of the Gebbies Pass prototype. Mechanical problems associated with the WTGs is well

publicised and the retrofitting of these WTGs to address on-going problems was identified during the declaratory proceeding. There is an appreciable risk that WTGs at TRH may experience mechanical problems and/or that there are maintenance fixes required that may have an impact on noise emissions. The Council has already had experience of this with the attribution of change of sound power levels as a result of mechanical fixes referred to in some earlier evidence. Condition 13 is therefore important to ensure regular updates of information relevant to noise emissions; and

- (c) The assumption of NZS 6808:2010 is that once compliance has been demonstrated, there can be a high level of confidence that the wind farm will comply on an on-going basis. In this case, that high level of confidence does not exist because of the technology used and therefore the general power to review conditions relating to noise emissions is justified.

#### **Capacity of NZWL to meet the noise conditions**

[86] I am not certain to what extent, if any, the proposed conditions of the notice of review will affect the operation of the TRH. MDA 2014 demonstrates that the existing standard is met at all reference locations and the application of NZS 6808:2010 measurement procedures for overall noise levels should not alter this. Any change in operational capability will be triggered by the secondary noise limit and the more detailed criteria for assessment of SACs and the application of the penalty regime.

[87] In relation to the high amenity standard, this will only apply up to 8 m/s. Beyond that the operation of the wind farm is unaffected. My understanding is that this standard will not necessarily limit the

operation of the wind farm unless the background sound is particularly low. This will not be true in all wind conditions. What the high amenity standard might do is apply in those conditions where there is a significant disparity between background sound levels and wind farm noise. In those circumstances, Mr Evans considers that the risk of annoyance is greatest. The potential of this situation is somewhat indicated by the regression analysis in MDA 2014. The correlation between these conditions and annoyance corresponds well with my understanding of the circumstances when residents are annoyed based on my dialogue with residents, and my review of their evidence in previous proceedings. The same relationship appears to have been identified where Mr Evans has also considered the complaints schedule as a source of information and understanding where the levels of annoyance exist and in particular the presence of special audible characteristics.

[88] In the course of my contact with NZWL I understand that they have remote control of the operation of the WTGs, including experimenting with the feathering of blades. I also understand that they have been exploring algorithms to address the small periods when noise is annoying residents. I am not aware of the detail as to the experimentation and planning, but it has been mentioned a number of times by NZWL's director, Mr Worth.

**Positive contribution of NZWL to New Zealand's renewable energy targets and the reduction in greenhouse emissions**

[89] All wind farms in Palmerston North are regionally significant infrastructure.

[90] The Council does not have access to the production statistics for the TRH. Published material indicates that the total production from the TRH and the TRH east extension are combined 130gwh/a. The range

in the last five years has been between 120gwh and 130gwh. The total number of WTGs in operation are 94, of which 65 (or 69%) are in the TRH. If the total production is roughly attributed equally amongst the WTGs, then the total production from the TRH ranges from 84 – 90gwh/a.

- [91] This production of TRH put in context is sufficient to provide energy to 18,000 homes.
- [92] Energy production using wind farms is in substitution of other forms of energy that contribute to greenhouse gas emissions. The amount of CO<sub>2</sub> emissions from wind farm energy generation is close to nil. In those circumstances, it is a highly privileged source of energy in a carbon constrained world.

**Adverse effects of the activity arising from the material inaccuracies in the original application**

- [93] The effects that are other or further than those predicted at the time consent was granted are well illustrated by the comparative maps prepared by Mr Halstead showing the predicted and actual levels. These are contained in the Council bundle at Part 6.
- [94] The effects of the activity at the receiver location are now felt by residents in the locality who were formerly informed they would experience nil, or less than 30dB(A) noise effects.
- [95] The adverse effects at a subjective level are well summarised by the residents in their affidavits as contained in the Council bundle at Part 5.
- [96] In an objective sense, complete data on noise levels from TRH's WTGs is provided in the MDA 2014. The Council remains concerned at the sample size used for the tonality assessments.

## Provisions of relevant policy instruments

### *National Policy Statement for renewable energy generation (NPS-REG)*

[97] The NPS-REG has a single objective that reads as follows:

#### **Objective**

To recognise the national significance of renewable electricity generation activities by providing for the development, operation, maintenance and upgrading of new and existing renewable electricity generation activities, such that the proportion of New Zealand's electricity generated from renewable energy sources increases to a level that meets or exceeds the New Zealand Government's national target for renewable electricity generation.

[98] There are then eight supporting policies and of those the following are considered relevant:

- B. Acknowledging the practical implications of achieving New Zealand's target for electricity generation from renewable resources

#### **POLICY B**

Decision-makers shall have particular regard to the following matters:

- a) maintenance of the generation output of existing renewable electricity generation activities can require protection of the assets, operational capacity and continued availability of the renewable energy resource; and
  - b) even minor reductions in the generation output of existing renewable electricity generation activities can cumulatively have significant adverse effects on national, regional and local renewable electricity generation output; and
  - c) meeting or exceeding the New Zealand Government's national target for the generation of electricity from renewable resources will require the significant development of renewable electricity generation activities.
- C. Acknowledging the practical constraints associated with the development, operation, maintenance and upgrading of new and existing renewable electricity generation activities.

**POLICY C1**

Decision-makers shall have particular regard to the following matters:

- a) the need to locate the renewable electricity generation activity where the renewable energy resource is available;
- b) logistical or technical practicalities associated with developing, upgrading, operating or maintaining the renewable electricity generation activity;
- c) the location of existing structures and infrastructure including, but not limited to, roads, navigation and telecommunication structures and facilities, the distribution network and the national grid in relation to the renewable electricity generation activity, and the need to connect renewable electricity generation activity to the national grid;

*Evaluation of the National Policy Statement on renewable electricity generation*

[99] The NPS-REG is a high level national policy statement focussed on ensuring that special regard is had to the benefits of renewable electricity generation and thereby address the effects of climate change. In this respect, the National Policy Statement implements Part 2 RMA, s 7(i) and (j).

[100] The NPS is implemented in the lower order planning documents by making express provision for wind farming in Palmerston North which has a known high quality resource. The arrangement and location of these wind farms is governed in part by landscape considerations and also in part by the requirement to comply with NZS 6808:2010. Neither of these constraints are identified in any relevant national policy statement as inappropriate constraints on wind farming activity.

[101] The emphasis in Policy C1 in relation to addressing the technical issues and practicalities of operating and maintaining renewable energy refers to the fact that renewable energy generation has a

functional need to be located near the resource. Also that the operation and maintenance of those facilities must recognise that the choice of location and nature of development is in part driven by technical considerations.

[102] I do not read any of the Policy in relation to practical or technical difficulties as directed at the specific issue of setting appropriate conditions on technology associated with the Windflow 500 WTG. I do consider they support the view that TRH is an important facility and that limitations on operation should be no greater than are reasonably justified. This would be true for the application for a new wind farm and also where consent is granted based on inaccuracies.

[103] I do consider that it is relevant when assessing the extent to which control should be placed on the wind farm to recognise the importance of optimising, as far as reasonably practicable, the operation of the wind farm. In relation to Policy C1, over the last four years the Council has asked NZWL to (if they could) design measures to address the concerns of neighbours that are affected. This occurred in 2013/14 at the Council arranged informal meetings between the public and NZWL facilitated by a former CEO of Manawatu District Council. No formal documentation or agreement arose as a result of those meetings. There has been no technical report that has identified how measures can be designed to optimise operations while addressing neighbour annoyance.

[104] The first Environment Court decision records former NZWL CEO, Mr Sadler as confirming that the operating protocols could be changed. At [99] the Court noted:

Mr Sadler considered that operating protocols could be changed to reduce noise particularly during periods of low windspeed and for winds in the SE sector.

[105] While the Council is aware that changes to operating protocols are possible, the Council does not have any comprehensive information about the use of those protocols to test management techniques to reduce annoyance of neighbours. I understand some testing has occurred since on or about April this year and the results efficacy of that testing is unknown. I simply draw to the attention of the Panel the fact that the Council is not able to assist on the practicability of making changes at an operational level, and the Council is not in a position to comment on operational changes that NZWL has experimented with. It simply doesn't have that information despite the history of this matter.

*Manawatu-Whanganui One Plan*

[106] The relevant objectives and policies in Chapter 3 in Part 1 (the Regional Policy Statement) of the One Plan:

**Energy**

Access to reliable and sustainable energy supplies is essential to the way society functions. People and communities rely on energy for transportation, and electricity for everyday activities at home and at work. A reliable and secure supply of energy, including electricity, is fundamental for economic and social wellbeing. Furthermore, the demand for electricity is increasing.

Government has developed energy strategies and made changes to the RMA to encourage energy efficiency and greater uptake of renewable energy over use of non-renewable resources. Renewable energy means energy produced from solar, wind, hydro, geothermal, biomass, tidal, wave and ocean current sources.

The Government has made a commitment to reduce New Zealand's greenhouse gas emissions and to achieve increasingly sustainable energy use. This commitment is expressed by the inclusion of sections 7(ba), 7(i) and 7(j) in the RMA in 2004 and in national strategy and policy documents dealing with energy, renewable energy, energy efficiency and conservation, and electricity transmission.

The electricity transmission network is recognised by a national policy statement as a matter of national significance.

As at 2009, the Government's target is for 90% of New Zealand's electricity generation to be from renewable energy resources by 2025. Collectively these Government policy instruments seek to achieve economy-wide improvements in the efficiency of energy use and an increase in the supply of energy from renewable energy resources.

Given these national policy instruments and the presence of significant renewable energy resources with potential for development in the Region, the Regional Council recognises that it needs to provide for the development of renewable energy resources and the use of renewable energy.

The Region has potential for the development of renewable energy facilities, given the areas with high wind speeds, the potential to develop hydroelectricity resources, and some potential for the use of wave energy around the coastline.

The development and use of renewable electricity generation facilities face a number of barriers that include the difficulty in securing access to natural resources as well as functional, operational and technical factors that constrain the location, layout, design and generation potential of renewable energy facilities. The adverse environmental effects of renewable electricity generation facilities can also be a barrier, if they are not appropriately avoided, remedied or mitigated.

### **Issue 3-2: Energy**

Energy conservation and energy efficiency are important but on their own will not be sufficient to meet future energy demands. If consumption of non-renewable energy resources is to be reduced or avoided, there will need to be an increase in the use of renewable energy resources. However, there are functional, operational and technical factors that constrain the location, layout, design and generation potential of renewable energy facilities.

#### **Objectives**

Objective 3-1: Infrastructure and other physical resources of regional or national importance.

Have regard to the benefits of infrastructure and other physical resources of regional or national importance by recognising and providing for their establishment, operation\*, maintenance\* and upgrading\*

Infrastructure and other Physical Resources of Regional or National Importance

*Policy 3-1:* Benefits of infrastructure and other physical resources of regional or national importance

- (a) The Regional Council and Territorial Authorities<sup>^</sup> must recognise the following infrastructure<sup>^</sup> as

being physical resources of regional or national importance:

- (i) facilities for the generation of more than 1 MW of electricity and its supporting infrastructure where the electricity generated is supplied to the electricity distribution and transmission networks

*Policy 3-3: Adverse effects of infrastructure and other physical resources of regional or national importance on the environment*

In managing any adverse environmental effects<sup>^</sup> arising from the establishment, operation\*, maintenance\* and upgrading\* of infrastructure or other physical resources of regional or national importance, the Regional Council and Territorial Authorities must:

- (a) recognise and provide for the operation\*, maintenance\* and upgrading\* of all such activities once they have been established,
- (b) allow minor adverse effects arising from the establishment of new infrastructure and physical resources of regional or national importance, and
- (c) avoid, remedy or mitigate more than minor adverse effects arising from the establishment of new infrastructure and other physical resources of regional or national importance, taking into account:
  - (i) the need for the infrastructure or other physical resources of regional or national importance,
  - (ii) any functional, operational or technical constraints that require infrastructure or other physical resources of regional or national importance to be located or designed in the manner proposed,
  - (iii) whether there are any reasonably practicable alternative locations or designs, and
  - (iv) whether any more than minor adverse effects that cannot be adequately avoided, remedied or mitigated by services or works can be appropriately offset, including through the use of financial contributions.

## **Energy**

*Policy 3-6: Renewable energy*

- (a) The Regional Council and Territorial Authorities<sup>^</sup> must have particular regard to:

- (i) the benefits of the use and development of renewable energy^ resources including:
  - (A) contributing to reduction in greenhouse gases,
  - (B) reduced dependency on imported energy sources,
  - (C) reduced exposure to fossil fuel price volatility, and
  - (D) security of supply for current and future generations,
- (ii) the Region's potential for the use and development of renewable energy^ resources, and
- (iii) the need for renewable energy^ activities to locate where the renewable energy^ resource is located, and
- (iv) the benefits of enabling the increased generation capacity and efficiency of existing renewable electricity generation facilities, and
- (v) the logistical or technical practicalities associated with developing, upgrading, operating or maintaining an established renewable electricity generation activity.

*Evaluation of Manawatu-Whanganui One Plan*

[107] The One Plan is clearly aimed at facilitating the development of renewable energy in the region. The support for renewable energy is most strongly found in Policy 3-6. Existing renewable energy infrastructure is recognised as regionally significant infrastructure.

[108] Policy 3-3 says in respect of regionally important infrastructure that minor effects from establishment must be allowed. In this respect, it doesn't refer to operation. Similarly, Policy 3-3(c) is focussed on the establishment effects of regionally significant infrastructure.

*Operative PNDP*

[109] The relevant objectives are those found in the Rural Zone, in Chapter 9 of the Operative PNDP. There is no specific objective relating to

management of wind farms and so the generic direction to avoid, remedy or mitigate effects is about as helpful as one can get from the objectives. I am mindful of the city wide objectives, but these are again at a high level.

- [110] The activity class for wind farms is discretionary which signifies that both location and the character and intensity of activity and its effects need to be managed including effects on aural amenity. There is below that listed class of activity in Rule 9.9.2 further policies including Policy B which aims *“to avoid, remedy or mitigate effects of noise and other environmental disturbance on the amenity of the surrounding area”*.

*Proposed PNDP*

- [111] The Proposed PNDP contains those provisions amending the Rural Zone and other related provisions as a result of PC15B.
- [112] It is already noted that Rural-Residential Overlay areas are identified in section 4 of the Plan as high amenity areas for the purpose of NZS6808:2010.
- [113] The most relevant objectives in Chapter 9 of the Plan are Objective 8 and Objective 9. Objective 8 is subject to appeal, but it supports appropriate new and existing renewable energy activities. Objective 9 seeks to avoid, remedy or mitigate adverse effects of renewable electricity generation.
- [114] The policies that result from Objective 8 and Objective 9 that are relevant in this case are Policy 9.1 and 9.2 as follows:

**Policy 9.1:**

To facilitate appropriate and well-designed upgrades of existing and consented renewable electricity generation activities recognising their existing effects on the existing environment.

**Policy 9.2**

To ensure that new renewable electricity generation activities are located, designed, constructed and operated to avoid, remedy or mitigate adverse effects and where this is not possible to take into account proposed off-site measures or environmental compensation.

- [115] Rule 9.8.6 is now a new rule governing wind farms. Assessment criteria (d) anticipates that noise effects will be assessed, measured and controlled in accordance with NZS6808:2010.

*Evaluation of operative and proposed City planning instruments*

- [116] The District Plan policy framework is strongly supportive of enabling appropriate renewable energy facilities and supports the continued use of existing renewable infrastructure.

- [117] Any wind farm established must expect that noise will be assessed, controlled and monitored in accordance with NZS6808:2010. The Standard as I read it allows for choices to be made about noise levels and controls with the ultimate aim of ensuring that the receiving population are not unduly annoyed by the wind farm's operation. In this case there are some characteristics of the wind farm that are special. In the end, these characteristics need to be factored into the overall consent framework so that the outcome is levels of noise that do not cause undue annoyance to neighbours.

- [118] I do not consider that the noise conditions applicable to an existing wind farm, where inaccurate information is being provided, should be any different from those that would apply to the same wind farm with the correct information. I do not see the policy shift from the Operative PNDP to the Proposed PNDP to be a significant one regarding aural amenity. It is simply that more contemporary standards are used with hopefully better tools to achieve the overriding goal of ensuring that the effects of wind farm noise are not unduly annoying to the receiving population.

## Evaluation of the notice of review proposal

### *Overview*

[119] The proposed notice of review contains the following six key elements:

- (a) Specified noise limits including a secondary noise limit;
- (b) Special provisions relating to the calculation of SACs;
- (c) Specification of NZS6808:2010 unless a more specific condition applies;
- (d) Specific control before Stage 4 is constructed, if at all; and
- (e) The power to review; and
- (f) Special reporting procedures including recording how compliance is achieved.

[120] I now deal with each of those elements and evaluate them.

### *Special reporting procedures including recording how compliance is achieved*

[121] It is essential for the Council to effectively monitor the consent to have accurate reporting information.

[122] The requirement in proposed condition 13 requires an annual report from the consent holder identifying changes in the WTG configuration or use that may affect noise emissions. The Windflow 500 is, in my opinion, a relatively new technology that has had well publicised problems in terms of acoustic performance and economic life and NZWL acknowledged it has these issues to the Council. Already, there have been changes to the gearbox that may have affected noise emissions. These occurred without the Council's knowledge. I am also aware that the operation of the WTGs,

including changes to blade orientation and the like occur, and the Council has very little information as to how these changes affect noise emissions. A significant concern is also the fact that maintenance work may change the noise emissions of the WTGs over their economic life.

[123] The fundamental assumption of NZS6808:1998 and 2010 is that post installation monitoring be carried out post construction and then it is expected that the noise emissions of the wind farm will remain relatively constant. In this case, there is an appreciable risk that that assumption is not valid. The annual reporting requirement ensures that the Council is kept abreast of changes that may affect acoustic emissions. In addition, this will encourage the consent holder to consider those impacts before carrying out work.

[124] I also consider that the post-compliance assessment conditions are important, including condition 10.6 that requires the identification of mitigation measures required to achieve compliance.

[125] I have been made aware by residents of voluntary efforts in the second quarter of this year by NZWL to change their operating protocols with a view to testing with the host population the extent to which levels of annoyance are reduced.

[126] The Council has not been told about the methodology that NZWL is employing. This is of concern to me as it could be relevant information to assist in the review process.

[127] More importantly, this underlines the fact that if NZWL employed operating protocols or some other measures to achieve consent conditions, these need to be specifically identified and reported to the Council so that the Council understands what restrictions on the activity are required in order to meet the consent conditions.

[128] Overall, I am satisfied that those elements of the conditions referred to in this section are appropriate and consistent with the policy direction of the relevant plans.

*The power to review*

[129] Allied to the point above, there must also be a power to review condition if changes occur that are other or further than those effects anticipated by the exercise of the consent.

[130] In addition, there is a risk that even with the secondary noise limit imposed by this consent, the controls remain insufficient to avoid undue annoyance. This may be unlikely, but the possibility is sufficiently serious that a right to review should exist.

[131] I am satisfied that a review condition is appropriate in the circumstances as a risk management tool given the nature of the technology and the uncertainties surrounding the efficacy of the proposed conditions to achieve the desired result. In particular:

- (a) Recognising the substantial difference between background sound level and wind farm noise levels and controlling noise levels so that annoyance is reduced; and
- (b) The SAC penalty regime is sufficient to remedy the known adverse effects associated with the SACs exhibited by these particular WTGs.

*Specific control before Stage 4 is constructed*

[132] Stage 4 has not been constructed and already the extent of adverse effects on neighbours has given rise to significant complaints.

[133] The conditions that the Council proposes are considered to be sufficient to avoid unreasonable annoyance and therefore in theory if Stage 4 can be constructed in a manner that achieves those

conditions, the Council does not consider, based on its present assessment, that that will give rise to unacceptable effects. What the Council wants to avoid is a situation where Stage 4 is constructed and only after that it is assessed that the conditions will not be achieved. The existing information filed with the application for consent is not accurate and it is simply impossible to know what the cumulative effect that Stage 4 might have. We also know from some of the analysis in MDA 2014 that even now compliance is achieved by the barest of margins without Stage 4. That is why in the second declaratory hearing there was expert analysis and debate about how the regression analysis was carried out under NZS6808:2010. This revealed that compliance largely rested on the statistical treatment of data points from MDA 2014 and the best fit curves used to derive the regression curve.

[134] Overall, I am satisfied that the conditions that place additional controls on Stage 4, if constructed, are appropriate and consistent with the relevant provisions in the planning instruments.

*Specification of NZS6808:2010 unless a more specific condition applies*

[135] Subject to the specific conditions recommended in the notice of review, where the requirements of NZS6808:2010 have been varied or replaced to address the specific issues with TRH, in all other respects, the consent contemplates the measurement, monitoring and information requirements of the consent that are needed to meet NZS6808:2010.

[136] There is no doubt that NZS6808:2010, in many respects, provides comprehensive information about the measurement and monitoring of noise emissions.

[137] I consider the references to NZS6808:2010 proposed in the reviewed conditions are appropriate and consistent with the relevant planning instruments.

*Special provisions relating to the calculation of SACs*

[138] There are special conditions relating to SACs. In particular:

- (a) Condition 8.2 uses a United Kingdom amplitude modulation metric; and
- (b) Conditions 8.3 – 8.5 provide a specific penalty regime that makes it plain that if 10% of the data points attract a penalty, then that penalty shall apply to the overall assessment level.

[139] I understand that SACs are a particular characteristic that can make wind farm noise annoying. I also acknowledge that TRH routinely produces SACs. I understand that the United Kingdom metric for amplitude modulation is the most contemporary statement of an objective method of assessment of amplitude modulation for wind farms. I support the use of an objective standard. Non-objective standards have proved problematic with enforcing this consent in the past and quantitative standards should be preferred to qualitative standards. In relation to a penalty for tonality, there are problems with sample size and there are also problems with how to apply the existing penalty regime. I accept Mr Evans evidence that the solution to this problem is to set an appropriate percentile beyond which relevant data points automatically trigger a penalty assessment.

[140] Overall, I am satisfied that the conditions governing SACs are appropriate and consistent with the relevant planning instruments.

*Specified noise limits including a secondary noise limit*

[141] But for the secondary noise limit, the conditions propose the existing level of noise set in the original consent, i.e. 40 dBA or the background sound level +5dBA.

[142] I consider this guideline limit is appropriate because in most conditions the noise from TRH is not annoying. This indicates that the default guideline limit in most conditions works appropriately.

[143] I consider that a secondary noise limit is warranted because my assessment is that when noise is annoying it is because the background sound conditions are very low relative to the wind farm noise. It also appears that these circumstances are related to particular wind conditions. I also note that neighbours experience about this problem is not uniform and that properties that are exposed or not directly within a line of sight to the wind farm do not appear to experience as much problem as some others.

[144] I am guided by Mr Evans as to if and how the secondary noise limit should apply.

[145] I understand that TRH has a cut-in speed of 5.5 m/s and that NZWL is proposing a threshold for the secondary noise limit at 6 m/s. If the secondary noise limit ceases at 6 m/s, then the conditions will only limit noise beyond the existing consent for the wind speed between 5.5 m/s and 6 m/s.

[146] I consider it implausible that an improvement in noise levels during a .5 m/s wind change duration will be sufficient to address the issues identified.

[147] Overall, I consider that the primary noise limit and the secondary noise limit proposed in the reviewed conditions are appropriate and consistent with the relevant planning provisions.

*Impact on the viability of TRH with revised conditions*

[148] Whether the activity “will continue to be viable” after the imposition of resource conditions is a relevant consideration of RMA, s 131.

[149] I agree with John Maassen that the concept of viability in s 131 relates to the activity and whether it can be successfully continued. In resource management practice, conditions cannot effectively frustrate the consent. I am satisfied that the activity will continue to be viable and in most wind conditions the TRH will continue to operate as it has in the past.

[150] I accept the conditions might affect the viability of Stage 4. However, I do not consider that the amended conditions add to that burden significantly beyond the burdens of the existing consent. In other words, there is no significant burden in terms of noise limits that the revised conditions create that are not replicated in the existing conditions. The impact of the existing conditions is, in my opinion, the baseline from which to make an assessment of the impact on viability.

**Recommended changes to the conditions of the notice of review**

[151] I have attached as **Appendix 1** a revised schedule of conditions . Further changes are in yellow.

[152] A number of the changes are minor and pick up changes proposed by NZWL that the Council does not oppose. These have also been highlighted in yellow.

[153] I have asked Mr Evans to consider the question of whether or not there should be a change to Condition 4 so that the spatial extent of the secondary noise limit applies to either or both of:

- (a) The northern side of Ridgeview Road; and

(a) The residences at Forest Hill Road.

[2] As a result of the answers given, I am satisfied that Condition 4 can remain as it is.

**Conclusion**

[3] This review process represents for the Council, a significant and hopefully final milestone in discharging the Council enforcement and monitoring responsibilities. It has been a long journey.

[4] I consider the conditions recommended in **Appendix 1** are appropriate on the present information available. I will update my opinion at the hearing in light of any new information received.

Date: 18 August 2017



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Craig Auckram