

10 November 2020

Glenn Starr  
Ventus Energy

via email: glenn@ventusenergy.co.nz

Dear Glenn

## **Taumatotara Wind Farm – Noise effects of change in turbine**

### **1 Introduction**

Ventus Energy holds a resource consent to install and operate 22 wind turbines at Taumatotara, in the Waitomo District. An application was submitted to vary the existing consent conditions to allow physically larger turbines than the conditions allow.

The noise condition that potentially prevented larger turbines was Condition 11:

*The wind turbines shall not exceed a rotor tip height of 110 metres above ground level and a sound power level of 107.2dBA unless it can be demonstrated by a person specialising in acoustics and accepted by the Manager, Policy and Planning, Waitomo District Council that higher turbine heights or sound power will still comply with the requirements of NZS 6808:1998*

Ventus had sought to change Condition 11 to reflect a maximum tip height to 172.5m.

Altissimo Consulting prepared a brief assessment<sup>1</sup> identifying why this was considered appropriate. This report was brief as we considered that the existing suite of conditions anticipated turbine changes, and that the consented effects envelope was more effectively defined by the noise limits, monitoring requirements, and turbine maximum sound power level.

On 22 August 2020, Ventus advised WDC that it no longer sought to amend Condition 11, as legal advice had confirmed that provided the requirements of NZS 6808:1998 were achieved (confirmed by an acoustics specialist) the consent allowed for the larger turbines.

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<sup>1</sup> Letter dated 25 June 2020

## 2 Review by Marshall Day Acoustics

A review of the application was made by Siiri Wilkening on behalf of the WDC. The queries raised by Marshall Day relate to perceived inadequacies with the original consent application, or alternatively were considering the application as though it was a new resource consent application.

A summary of the review is provided below:

*In summary, an assessment of wind farm noise needs to be undertaken in accordance with the relevant NZS6806:2010 standard, taking into consideration the Institute of Acoustics prediction methodology, which is considered industry best practice. The existing information is not sufficient to determine compliance with the relevant performance standards.*

The information requested is listed in Table 1.

## 3 Response

We agree that there has been significant change in best practice since the acoustics assessment that supported the 2005 consent was prepared. We do not consider that this is a relevant factor in determining the effects of the proposed condition change. We also note that the original consent is still current and able to be implemented.

We consider that a complete assessment of the revised wind farm is not appropriate for the following reasons:

- Turbines 1-11 are in the same locations as the original consent (subject to micro-siting). These are approximately 2km from the nearest houses.
- Turbines 12-22 have been deleted.
- There is a restriction on the maximum turbine sound power level in Condition 11, which Ventus is not proposing to change.
- Condition 10 requires a management plan with final turbine locations and modelling to be submitted to the consenting authority prior to construction.

Our position is that there is not a valid acoustic reason for the tip height restrictions. It is not consistent with best practice, and the remainder of the acoustics conditions are adequate to control effects.

The Marshall Day review concluded that the following additional information was required. We have responded why we consider this unnecessary.

**Table 1** Information requested

Item	Information requested	Response
3	At least one appropriately timed survey of sufficient duration should be undertaken to fulfil the requirements of NZS6808. This survey should be undertaken at one relevant receiver location following accurate predictions of noise levels at all relevant receivers (refer below). The receiver location should not be on the wind farm site. However, if a dwelling is outside the wind farm site but has provided written approval, this location may be a suitable measurement location.	<p>This request relates to issues with the original application.</p> <p>There is no proposal to alter the turbine locations, therefore no new receivers are affected.</p> <p><b>No additional information required</b></p>
4	The coordinates of all dwellings that are to be assessed (i.e. not on the wind farm site, or from which written approval has been obtained from the owner and occupier)	<p>Coordinates are included on the site plan v1.1c.</p> <p><b>We recommend that this plan is updated to clearly identify which positions noise limits apply to</b></p>
5	The coordinates of any dwellings that are not on the wind farm site, but from which written approval has been obtained, and confirmation that written approval has been provided by owner and occupier following information provided about the predicted noise levels.	<p>No reliance is made on affected party approvals to process this alteration</p> <p><b>No additional information required</b></p>
6	For the proposed wind turbine, manufacturer's sound power data (in 1/3 octave band) for wind speeds from cut in to cut off; and	<p>We do not consider wind farm noise levels need to be predicted to support this the application to vary consent condition 3.</p> <p>This will be included in the prediction report prior to construction as required by consent condition 9.</p> <p><b>No additional information required</b></p>
7	A table of wind turbine coordinates, including absolute hub height.	<p>Turbines 1-11 remain at their original locations (subject to micro-siting)</p> <p>Full location including hub height will be included in the report required by condition 9.</p> <p><b>No additional information required</b></p>

Item	Information requested	Response
8	Predicted noise levels for each of the relevant receiver positions identified under (b) and (c) above. The prediction should be based on the highest sound power level (and based on 1/3 octave sound data), the updated hub height and the relevant current prediction method (IoA method).	<p>We do not consider wind farm noise levels need to be predicted to support the application to vary consent condition 3.</p> <p>This will be included in the prediction report prior to construction.</p> <p><b>No additional information required</b></p>
9	Noise level contours, predicted in accordance with the IoA method, extending beyond the wind farm sites.	<p>This will be included in the prediction report prior to construction</p> <p><b>No additional information required</b></p>
10	For the survey position from [presumably 3] above, analysis of measured data showing the wind/background sound data and the predicted wind farm noise level per wind speed predicted under [presumably 9] above.	<p>This will be included in the monitoring report prior to construction</p> <p><b>No additional information required</b></p>
11	Prediction of corona noise at closest houses.	<p>This is unrelated to the application to vary consent condition 3.</p> <p><b>No additional information required</b></p>
12	Prediction/discussion of circuit breaker noise as well as any substation noise.	<p>This is unrelated to the application to vary consent condition 3.</p> <p><b>No additional information required</b></p>

#### 4 Resolution

While Condition 11 allows a greater turbine height provided that noise limits from NZS 6808:1998 can be achieved, you have asked me propose a set of conditions that reflect current best practice and may give WDC more comfort that effects will be managed as the consent is exercised. In the following table I list the current (operative) condition and a suggested update.

**Table 2** Noise conditions and potential updates

No	Operative condition	Suggested update
7	<p>The noise from all other activities on the site (other than wind turbine generator operation and construction activities) shall not exceed the following limits when measured in accordance with the requirements of NZS 6801:1991 Measurement of Sound and assessed in accordance with NZS 6802:1991 Assessment of Environmental Sound:</p> <p>7.00am to 7.00pm      45 dBA L<sub>10</sub>  7.00pm to 7.00pm      35 dBA L<sub>10</sub>     60 dBA L<sub>max</sub></p>	<p>The consent holder shall ensure that sound from sources on the site other than those within the scope of conditions 8 and 12 does not exceed the following noise limits:</p> <p>7.00am to 7.00pm    45 dB L<sub>Aeq(15min)</sub>  7.00pm to 7.00pm    35 dB L<sub>Aeq(15min)</sub>     60 dB L<sub>AFmax</sub></p> <p>Sound shall be measured in accordance with NZS 6801:2008 and assessed in accordance with NZS 6802:2008.</p> <p>The assessment positions shall be at the noise sensitive locations shown on Site Plan 1.1c attached.</p>
8	<p>The noise from the wind farm shall comply with the requirements of <i>NZS 6808:1998 Acoustics – The assessment and measurement of sound from wind turbine generators</i> in relation to any dwelling existing at the date of the granting of this consent, except:</p> <p>a) Any dwelling on any site the forms part of the wind farm; and  b) The dwellings labelled as H1, H2, H2A, H3 and H4 on the approved plans</p>	<p>The consent holder shall ensure that, at the specified assessment positions, at any wind speed, wind farm sound levels do not exceed 40 dB L<sub>A90(10 min)</sub></p> <p>Wind farm sound shall be measured and assessed in accordance with NZS 6808:2010.</p> <p>The Assessment Positions shall be outside at the noise sensitive locations shown on Site Plan 1.1c attached.</p>
9	<p>Prior to commencing any development of the wind farm, detailed ambient noise monitoring shall be undertaken within the notional boundary of any dwelling within the 30 dBA noise contour (other than the dwelling specifically referred to in A&amp;B of condition 8 above in (a) and (b) a person suitably qualified and experienced in acoustics and accepted by the Manager, Policy and Planning, Waitomo District Council. The monitoring shall be undertaken to determine the existing background sound in terms of requirements of NZS 6808-1998. Sufficient field measurements shall be undertaken to demonstrate to the satisfaction of Council's</p>	<p>Prior to commencing any development of the wind farm, background sound level measurements shall be undertaken at any Assessment Position within the 30 dB L<sub>A90</sub> contour. Measurements shall be measured in accordance with Section 7.4 of NZS 6808:2010.</p> <p>If no Assessment Positions have predicted sound levels above 30 dB L<sub>A90</sub>, measurements shall be performed at two locations agreed with Council.</p> <p>A report of measured sound levels shall be prepared in accordance with Section 8.2 of NZS 6808:2010 and submitted to</p>

No	Operative condition	Suggested update
	Manager, Policy and Planning, that the best fit regression curve gives an accurate representation of the existing noise environment.	the Manager, Policy and Planning, Waitomo District Council.
10	Prior to commencing any developed on the wind farm, the consent holder shall prepare a noise report to demonstrate, to the satisfaction of Council's Manager, Policy and Planning, that the wind farm will comply with the requirements of NZS 6808:1998. The report shall be prepared by person suitably qualified and experienced in acoustics an accepted by the Manager Policy and Planning, Waitomo District Council	Prior to commencing any development on the wind farm, a prediction report shall be submitted to the Manager Policy and Planning, Waitomo District Council in accordance with Section 8.4.2 of NZS 6808:2010.  The prediction should be based on the highest sound power level, and include results for both NZS 6808:2010 and IoA GPG method).
11	The wind turbines shall not exceed a rotor tip height of 110 meters above ground level and a sound power of 107.2 dBA unless it can be demonstrated by person specializing in acoustics and accepted by the manager policy and planning, Waitomo District Council that higher turbine heights or sound power will still require will still comply with the requirements of NZS 6808:1998	The wind turbines shall not have a sound power level of greater than 107.2 dB L <sub>WA</sub> .  A certificate confirming the sound power level shall be included in the prediction report required by Condition 10.
12-15	Construction noise – no changed proposed	
16	Within six months of commencement of operation, the noise levels shall be measured and results provided to the Manager of Waitomo	Within six months of commencement of operation, wind farm sound levels shall be measured at all Assessment Positions where predicted sound levels were greater than 30 dB L <sub>A90</sub> .  If no Assessment Positions have predicted sound levels above 30 dB L <sub>A90</sub> , measurements shall be performed at two locations agreed with Council.  A compliance assessment report shall be submitted to the Manager Policy and Planning, Waitomo District Council in accordance with Section 8.4.1 of NZS 6808:2010.

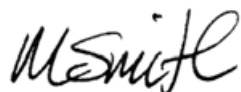
## 5 Additional assessment position

We note that the Martin property did not exist when the original consent was granted. Therefore, under Condition 8, noise limits would not apply at this location. Ventus Energy has agreed to include this property as an Assessment Position in the conditions in Table 2.

## 6 Conclusion

We consider that the larger turbines that Ventus propose are consistent with the noise envelope consented. The information requested in the s92 request is largely to address perceived inadequacies with the original consent, and in our opinion are not appropriate. We have recommended updated conditions that will ensure future measurements and predictions are consistent with current practice and hopefully this will afford WDC more comfort that the noise effects of the project are within scope of the existing consented environment.

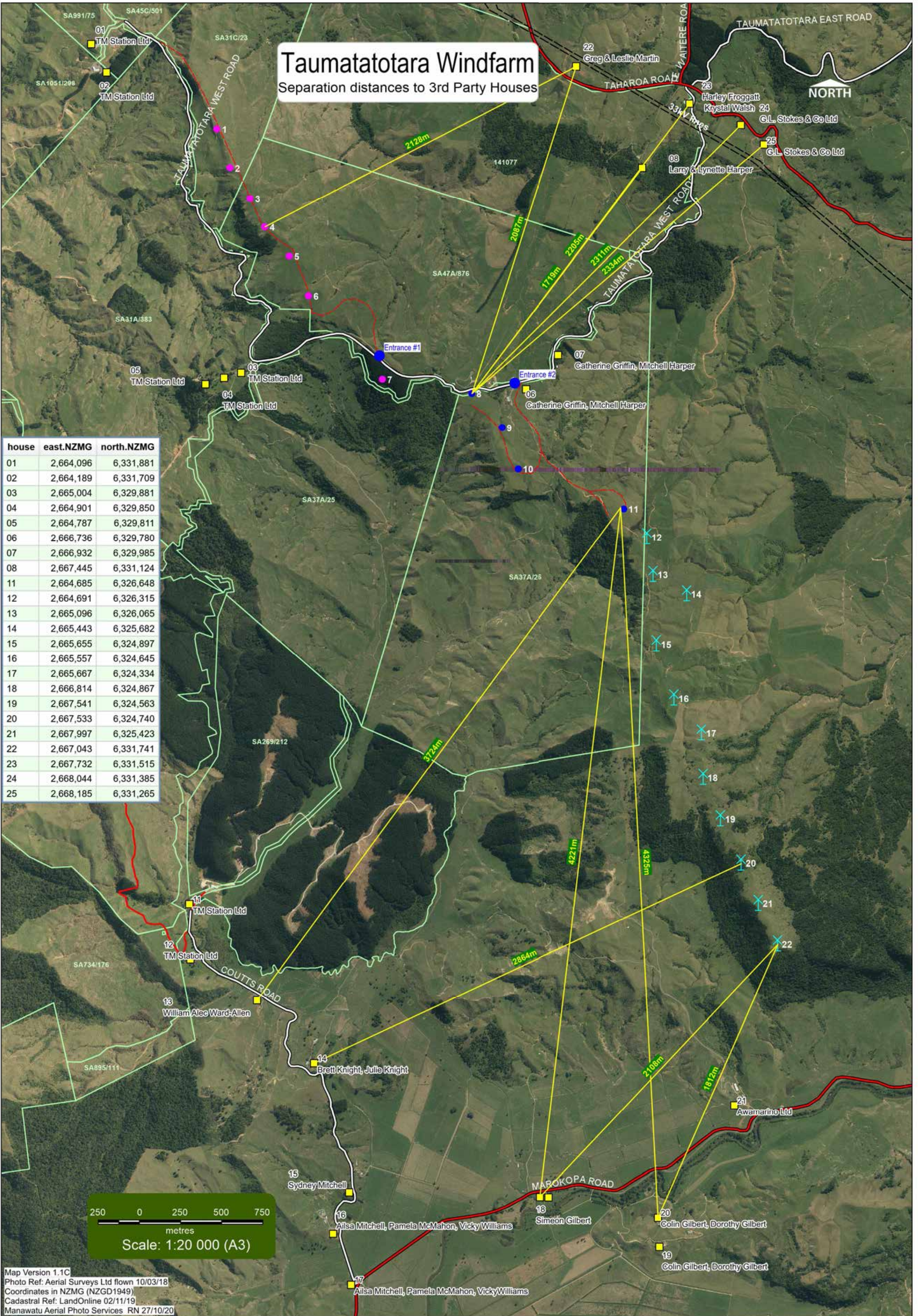
Yours sincerely  
Altissimo Consulting Ltd



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Principal Acoustics Engineer  
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# Taumatatotara Windfarm

## Separation distances to 3rd Party Houses



house	east.NZMG	north.NZMG
01	2,664,096	6,331,881
02	2,664,189	6,331,709
03	2,665,004	6,329,881
04	2,664,901	6,329,850
05	2,664,787	6,329,811
06	2,666,736	6,329,780
07	2,666,932	6,329,985
08	2,667,445	6,331,124
11	2,664,685	6,326,648
12	2,664,691	6,326,315
13	2,665,096	6,326,065
14	2,665,443	6,325,682
15	2,665,655	6,324,897
16	2,665,557	6,324,645
17	2,665,667	6,324,334
18	2,666,814	6,324,867
19	2,667,541	6,324,563
20	2,667,533	6,324,740
21	2,667,997	6,325,423
22	2,667,043	6,331,741
23	2,667,732	6,331,515
24	2,668,044	6,331,385
25	2,668,185	6,331,265

Map Version 1.1C  
 Photo Ref: Aerial Surveys Ltd flown 10/03/18  
 Coordinates in NZMG (NZGD1949)  
 Cadastral Ref: LandOnline 02/11/19  
 Manawatu Aerial Photo Services RN 27/10/20