

1 December 2022

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Lal Lal Wind Farms Nom Co Pty Limited ACN 625 768 774
al Lal Wind Farms Partnership
c/- Res Australia Pty Limited
Suite 4, Level 1
760 Pacific Highway
Chatswood NSW 2067

Attention: Andrew Polimeni

Dear Andrew

Elaine Wind Farm - Noise compliance

SLR Consulting (SLR) has been engaged by Lal Lal Wind Farms Nom Co Pty to provide a summary of pre-construction noise prediction, post construction noise monitoring and compliance assessment undertaken by SLR for Elaine Wind Farm which is relevant to the property located at 308 Elaine-Mount Mercer Road, Elaine from which noise complaints have been received.

In all pre-construction and post construction noise assessment reports this property is referred to as receptor J14aa.

1 Pre-construction

Condition 23 of the Planning Permit (ref: Planning Permit No. PL-SP/05/0461-2 amended 12 April 2022) defines the operational noise limits based on the New Zealand Standard NZS 6808 as follows:

23. *Except as provided below in this condition, the operation of the wind energy facility must comply with New Zealand Standard 6808:2010, Acoustics – Wind Farm Noise (the Standard) as modified by this condition to the satisfaction of the Minister for Planning.*

In determining compliance the following requirements apply:

- a) The operator must ensure that at any wind speed, wind farm sound levels, determined in accordance with the Standard at noise sensitive locations (as defined in the Standard) do not exceed a noise limit of 40dB LA90,10min or background (LA90,10min) plus 5dB, whichever is greater.*
- b) Compliance must be assessed separately for all-time and night time. For the purpose of this requirement, night time is defined as 10.00pm to 7.00am, and*
- c) Where special audible characteristics, including tonality, impulsive sound or excessive amplitude modulation occur, the measured noise level with the identified special audible characteristics will be modified by applying a penalty of up to +6 dB L90 in accordance with section 5.4 of the Standard.*

Any dwelling on the subject land may be exempt from this condition. This exemption will be given effect through an agreement with the landowner and must be registered on title, unless varied through the written consent of the Minister for Planning. Such dwellings will be known as host dwellings.

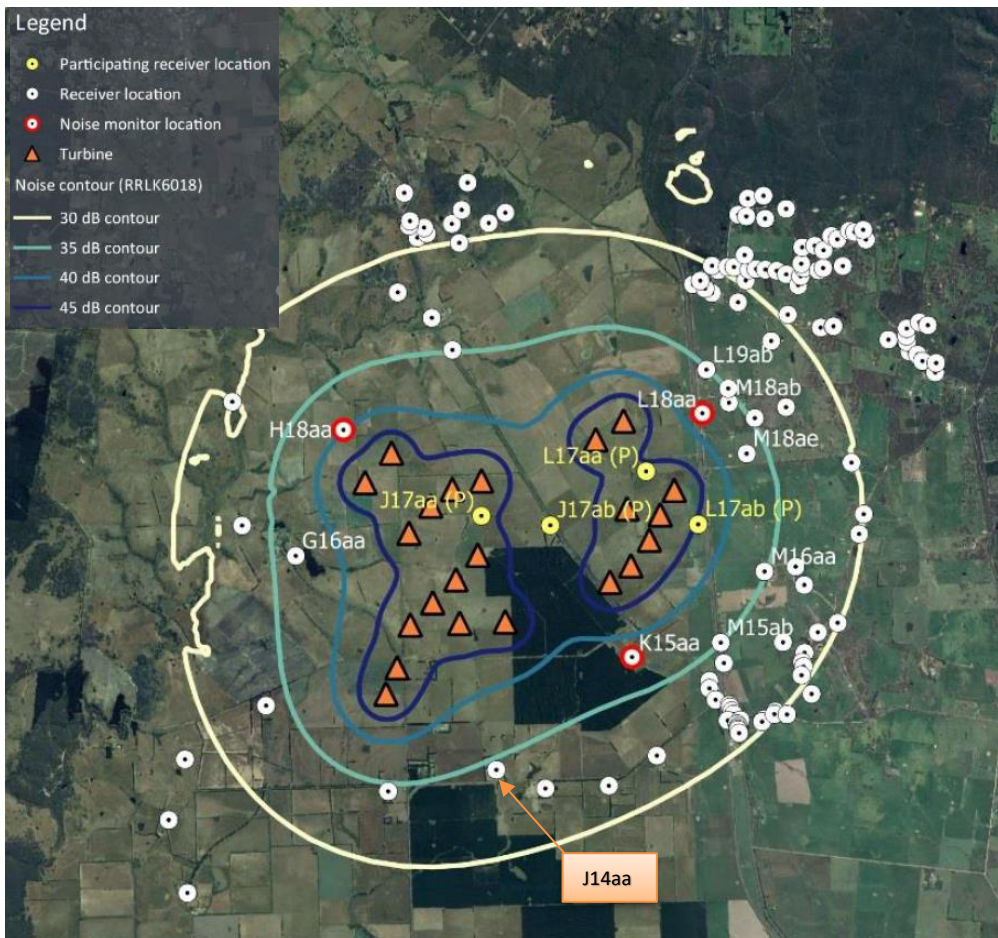
1.1 Noise Compliance Test Plan

The Noise Compliance Test Plan (NCTP) (which forms Endorsed Condition 24 and 25 of the Planning Permit) produced by Marshall Day Acoustics (report ref: 003 R03 20170649) provides a predicted noise contour for Elaine Wind Farm as per **Figure 1**. It is clear that receptor J14aa is predicted to be at a wind farm noise level of below 35 dBA, noting that the prediction has assumed worst case down-wind noise propagation and WTG noise directivity, although it is not clear if the model assumed the as built layout or WTG model. Subsequent noise modelling for the 'as built' layout was completed and the relevant result presented in **Section 1.2**.

The NCTP nominates reference receptors surrounding the wind farm for which NZS6808:2010 noise limits are determined based on background noise monitoring. The reference receptors were selected as they represent the closest residence to WTGs and have the highest predicted noise level, with the rationale being that if the wind farm is determined to be noise compliant at the reference receptors then other receptors further from the wind farm and at a lower wind farm noise level would also be compliant. The relevant reference location to receptor J14aa is K15aa.

Pre-construction baseline noise monitoring was completed by SLR at location K15aa in approximately October 2018 and the relevant noise limits determined.

Figure 1 NCTP predicted noise contour



With regard to non-reference receptors the NCTP provides the following in respect to demonstrating compliance:

At all non-stakeholder receivers where a representation of background noise data is not available, compliance may be demonstrated by determining that operational wind farm noise levels are below the minimum noise limit of 40 dB L_{A90} . However, where operational noise levels are determined to potentially be higher than 40 dB L_{A90} at a non-stakeholder receiver, background noise data will be required in order to assess compliance.

Therefore, if wind farm noise at J14aa is determined to be below the minimum limit of NZS6808:2010, being 40 dBA L_{90} , then it will have demonstrated that it is compliant with Condition 23 of the Planning Permit.

1.2 Pre-construction Noise Assessment

The Pre-Construction Noise Assessment was prepared by Sonus (ref: S5464C11) in June 2018.

It summarises an assessment of the prediction of noise from the proposed operation of 60 Vestas V136, 3.8MW turbines. The report indicates a predicted wind farm noise level at:

- receptor J14aa of 33 dBA
- reference receptor K15aa of 37 dBA

2 Post construction

2.1 Complaints based - Interim compliance monitoring

In October-November 2020 SLR completed “interim compliance” monitoring at four receptor locations, including J14aa. The monitoring, analysis and assessment is documented in SLR report *Lal Lal Wind Farm - Interim Noise Monitoring (J14aa, N34ac, K34aa and L28aa)* ref:40.11872-R03-v1.2-20210412.

This monitoring campaign could only be considered as an interim check of compliance as the wind farm was not yet operating at full capacity owing to constrained operations being imposed by the network operator as the wind farm went through its mandatory hold point testing. This is a process whereby the wind farm ramps up production over a period in accordance with requirements set by the Australian Energy Market Operator (AEMO). It was therefore not appropriate to conduct a formal compliance test.

The objective of the interim noise assessment was to measure and assess the noise levels from the wind farm in relation to the noise limit requirements of the Lal Lal Wind Farm to address community concerns around noise.

In addition to the noise monitoring, each of the residents was left with a Noise Observation Log with the instruction that the resident record periods when they found the wind farm particularly prominent in noise level or noise character, such to assist in the analysis of the noise monitoring data and to get a better understanding of the nature of any noise issues being experienced by the resident.

Noise monitoring and analysis was completed in general accordance with the NCTP, with some exceptions owing to the constrained operation of the wind farm and the substitution of attended surveys with audio review of recorded audio during the periods identified by the resident Noise Observation Log.

No previous base line monitoring has been completed at receiver J14aa, and hence the measured noise data (yellow line) was not able to be corrected to remove the influence of ambient background noise sources. That is to say that the measured noise data at J14aa includes both ambient background noise as well as wind farm noise. Furthermore, given the highest predicted noise level of WTG noise at J14aa was approximately 33 dBA and at higher wind speeds where measured noise levels are significantly higher than 33 dBA it is to be expected that ambient background noise sources increasingly dominate the noise environment e.g. at high wind speeds the measured noise data would be due to ambient noise sources.

Similarly, as no previous base line monitoring has been completed at receiver J14aa the noise limit at the nearest reference receptor (K15aa) was included as it is likely to be the most representative of all reference receptors on the basis of:

- Geographic proximity of K15aa to J14aa (approximately 2.3km apart)

- Similar proximity and scale of local tree / wind breaks
- Similar proximity to large established pine plantations
- The closer proximity of K15aa to the Midland Highway is unlikely to have made a significant difference at higher wind speeds where background noise level is relevant to the noise assessment.

Therefore the noise limit for K15aa was deemed to be suitably indicative for the purposes of interim compliance monitoring at receptor J14aa.

The resulting assessment graphs of J14aa (measured noise = background + WTG noise) are shown against the indicative assessment criteria for the nearest reference receptor, shown in **Figure 2** and **Figure 3**. Both results indicate compliance, noting that the measured noise level still includes the influence of ambient background noise and is not reflective of the WTG only noise.

The measured noise level (measured noise = background + WTG noise) exceeds the minimum noise limit of 40 dBA above 11 m/s wind speed (noting that at this wind speed the noise limit would likely be defined by background +5dB). However, this is most likely the result of increasing ambient background noise influence with increasing wind speed. This can be deduced by the fact that the noise emission specification of the Vestas V136, 3.8MW WTG shows that sound power level increases with hub height wind speed up until 9 m/s whereupon it plateaus at a constant level, however, the measured noise level at J14aa continues to increase with wind speed.

Actual WTG contributed noise level at J14aa could be confirmed with:

- On / Off testing at specific targeted wind conditions, and/or
- Extrapolate predicted noise to J14aa based upon the determined WTG noise level at a closer intermediate monitoring location

Figure 2 J14aa interim compliance results - all time

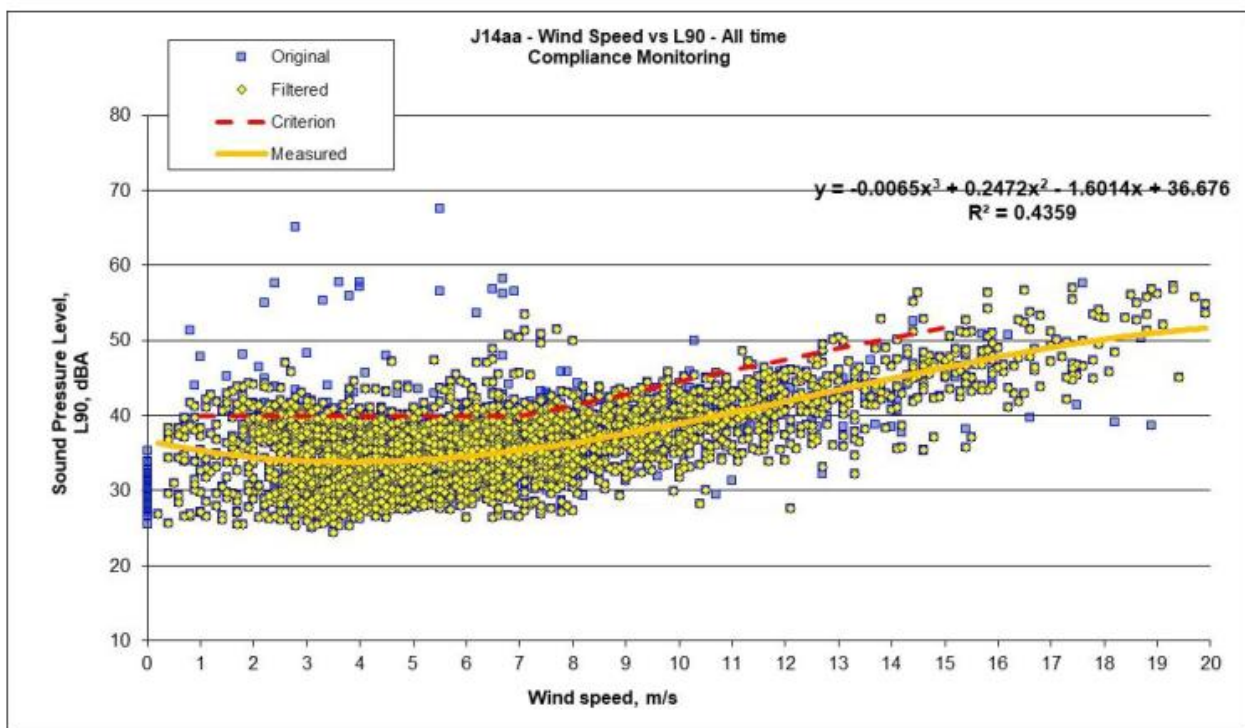
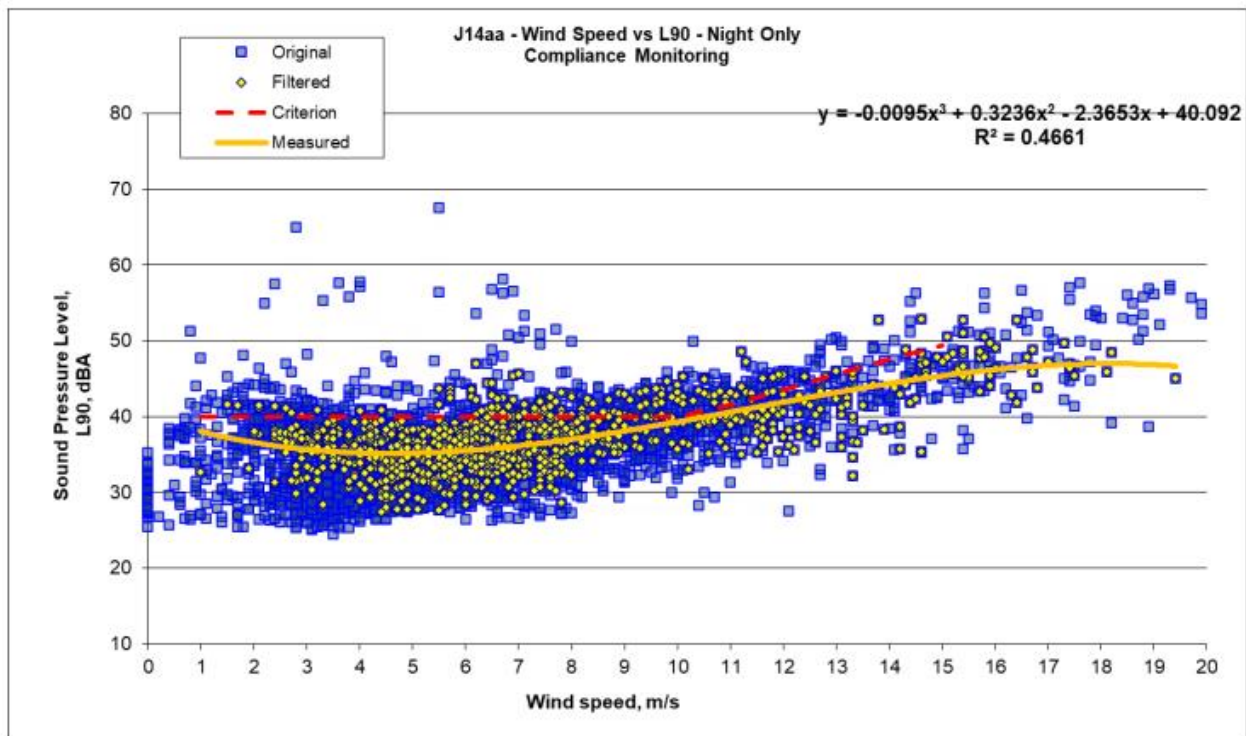


Figure 3 J14aa compliance results – night only



2.2 Stage 1 compliance monitoring Elaine

Stage 1 compliance monitoring for Elaine Wind Farm was conducted between March and May 2021, during which time the wind farm was electrically and mechanically complete and had been released by the market operator to generate at full power and is documented in SLR Report *Lal Lal Wind Farm - Elaine - Compliance Noise Monitoring* (ref: 640.11872-R04-v1.7-20220627).

Unattended noise compliance monitoring was undertaken for a period of approximately 60 days between 9 March 2021 to 8 May 2021 at the three reference receptors K15aa, H18aa and L18aa.

For context the reference receptor K15aa is relevant to J14aa because:

- The reference receptor K15aa is nearest to J14aa (~2.3km).
- The reference location K15aa and J14aa are both to the south of Elaine Wind Farm.
- The reference location K15aa and J14aa are downwind of their respective nearest WTGs in wind directions between North-west to North.
- The nearest WTG at reference location K15aa is approximately 970m, the nearest WTG at J14aa is approximately 1750m.
- The reference location K15aa has six WTGs within a 2km radius, J14aa has four WTGs within a 2km radius.
- The predicted noise level at reference receptor K15aa is approximately 3dBA higher than at J14aa.

In consideration of the above, if wind farm noise is determined to be compliant at K15aa then it may be reasoned that wind farm noise is also compliant at J14aa.

The collected data was screened to obtain a valid data set by excluding data intervals in accordance with the NCTP to remove periods of local rain, periods of wind outside the operating wind speed range, periods adversely affected by extraneous insect or frog noise, or when one or more WTGs critical to wind farm noise level at each receptor was not operating. On this last point the data set was screened in two slightly different ways, the NCTP method (which allows up to a 0.1 dB tolerance for non-operational WTGs compared to full operations), and the slightly less conservative 0.5 dB method which provides a higher number of valid data points and is equally acceptable provided the assessment finding is of a margin of compliance greater than 0.5 dB.

During the survey period subjective assessment listening surveys were completed and it was observed that at some times and survey locations, there was an audible and discernible “hum” character in the noise emissions from turbines. No other special audible characteristics were observed in the listening surveys.

On the basis of the observed audible “hum” character and in accordance with the NCTP an objective assessment for tonality was completed on the recorded audio samples for all valid intervals, in accordance with ISO/PAS 20065:2016. All intervals in which a tone of sufficient audibility was identified had the requisite K factor penalty as determined using ISO/PAS 20065:2016 arithmetically added to the measured LA90 for that interval.

The NCTP method screened valid data set yielded less than the 1440 points recommended by NZS 6808, however, the assessment still indicates that all receptors comply with their relevant NZS 6808 noise criteria and the planning permit noise limits. The result infers a minimum margin of compliance at K15aa, H18aa and L18aa of approximately 8 dBA, 3 dBA and 10 dBA respectively.

The valid data set using the 0.5 dB method yielded more than the 1440 points recommended by NZS 6808 and the assessment still indicates that all receptors comply with their relevant NZS 6808 noise criteria and the planning permit noise limits. The result infers a minimum margin of compliance at K15aa, H18aa and L18aa of approximately 8 dBA, 2 dBA and 8 dBA respectively.

The resulting assessment graphs of K15aa are shown against the assessment criteria in **Figure 4** and **Figure 5**. The Background corrected WTG only noise level (Green line) for all-time period was determined to plateau at approximately 37 dBA, which is consistent with the Pre-Construction Noise Assessment predicted noise level at this receptor, recalling the predicted noise level at J14aa was approximately 33 dBA, which represents a 7 dBA margin of compliance with the minimum noise limit of 40 dBA.

Figure 4 K15aa compliance results - all time

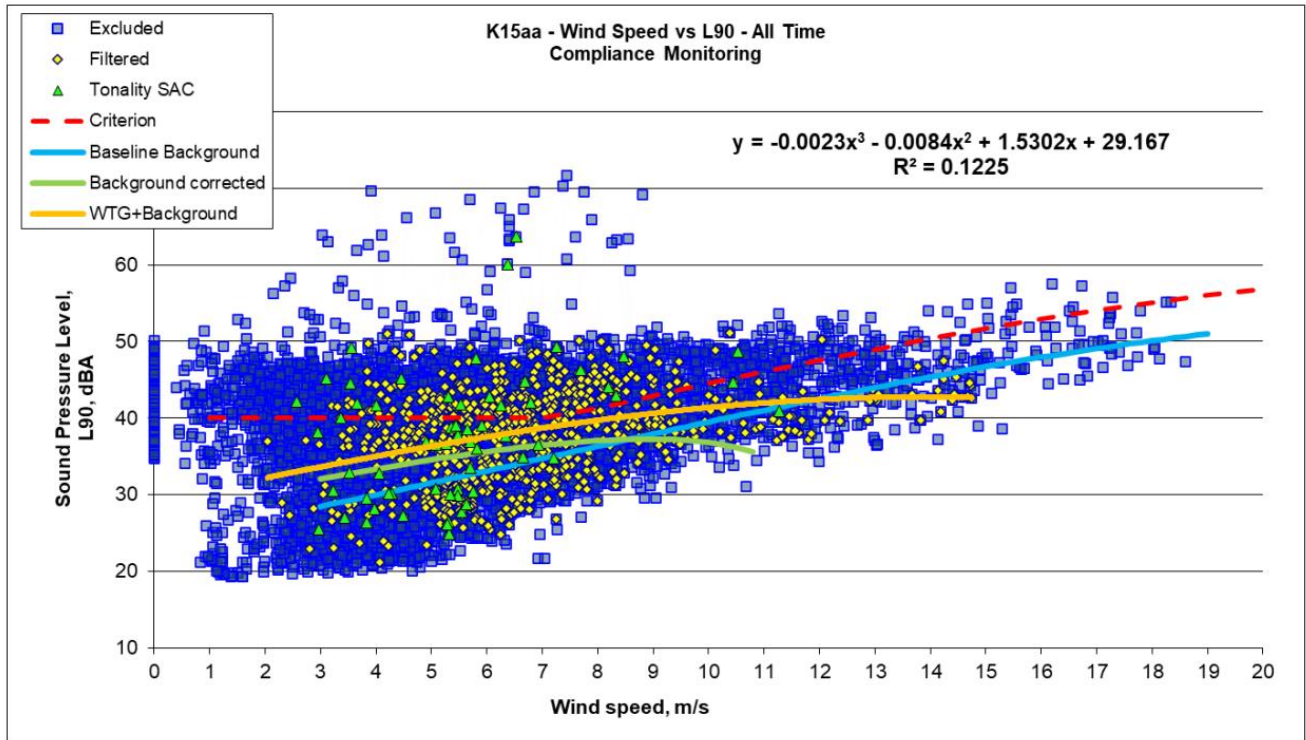
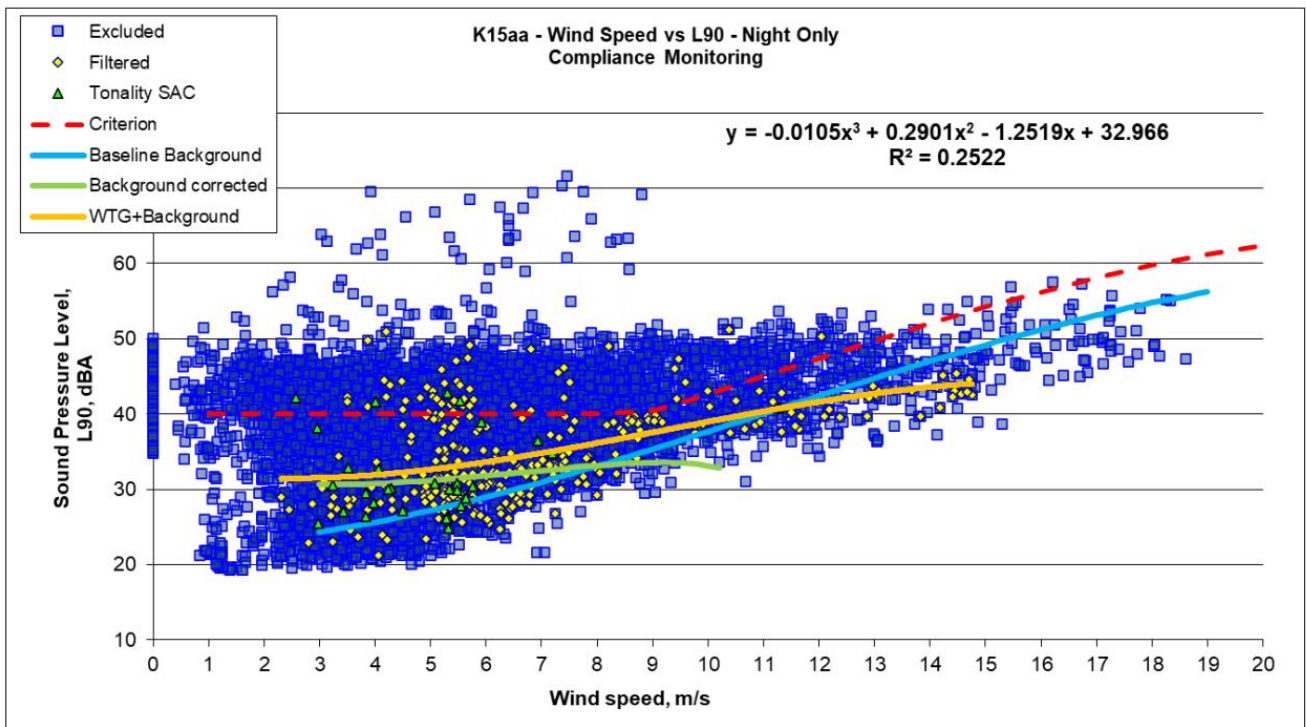


Figure 5 K15aa compliance results – night only



2.3 DST legal letter 22 August 2022

DST Legal wrote a letter to Herbert Smith Freehills dated 22 August 2022, which was forwarded to SLR Consulting, the Minister for Planning as well as Moorabool Shire Council. In the letter Ms. Tannock raised a number of issues I wish to address.

On page 2 of the letter Ms. Tannock states:

On Thursday, 21 July 2022, following my repeated requests, you sent to me a redacted copy of SLR's post-construction **Interim Noise Monitoring Report** dated April 2021 showing the noise monitoring results of J14aa, from which the Summary had been extrapolated. Below are SLR's representations about compliance margin and compliance results referable to J14aa. SLR represents that "*negative means the measured noise is below the criteria*" – the criteria being the base noise limit of 40 dB.

The compliance margins tabulated in the interim compliance report for J14aa are shown in Table 4, Table 5, Table 12 and Table 13 of the interim report. They were calculated as the difference in the measured noise level (which includes WTG + baseline noise) and the criterion which was established for K15aa and deemed to be suitably indicative for the purposes of interim compliance monitoring at receptor J14aa.

Ms. Tannock wrongly identifies that the criteria is the base noise limit of 40 dB.

An extract of Table 12 from the report is included below, which shows the suitably indicative K15aa noise criterion, J14aa measurement level (which includes WTG + baseline noise) and the resulting compliance margin.

Table 12 J14aa interim compliance results – all time

Hub Height Wind Speed (m/s)	3	4	5	6	7	8	9	10	11	12	13	14
Criterion (K15aa)	40	40	40	40	40	40	40	42	44	47	49	51
Measurement	23	24	26	28	30	32	34	37	39	42	44	46
Compliance margin	-6	-6	-5	-5	-5	-5	-6	-6	-6	-6	-5	-5

A further issue Ms. Tannock raises in her letter on page 2 and page 3 are shown below.

The background noise assessments demonstrate that the results set out in the Summary and the Interim Noise Monitoring Report are false, misleading or deceptive or likely to mislead or deceive. What SLR omits to have reported is that K15aa is obviously inappropriate to have been used as a proxy background location to measure noise levels and assess impact at J14aa (Mr and Mrs Lewis' property). The measured

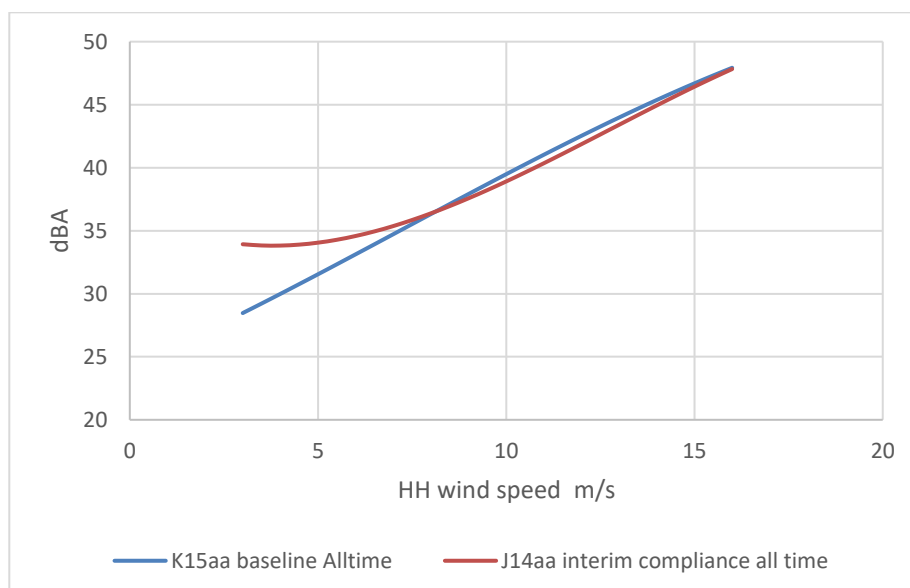
background noise levels (all hours) at K15aa are significantly higher than the measured post-construction noise levels (all hours) at J14aa. These findings are patently absurd and unlawful.

As I have set out previously, the reference receptor (K15aa) was deemed an appropriate proxy background location to assess impact at J14aa on the basis of:

- Geographic proximity of K15aa to J14aa (approximately 2.3km apart)
- Similar proximity and scale of local tree / wind breaks
- Similar proximity to large established pine plantations
- The closer proximity of K15aa to the Midland Highway is unlikely to have made a significant difference at higher wind speeds where background noise level is relevant to the noise assessment.

Ms. Tannock asserts that the measured background noise levels (all hours) at K15aa are significantly higher than the measured post-construction noise levels (all hours) at J14aa. Such a direct comparison was not previously made by SLR in any proceeding reports, so presumably she came to that conclusion through comparison between the K15aa Baseline & J14aa Interim reports. For clarity I can provide the direct comparison in **Figure 6** below.

Figure 6 Comparison of K15aa baseline to J14aa interim compliance – All time



I make the following observations on the above figure:

- The comparison graph shows that at below 8 m/s the interim compliance monitoring at J14aa is higher than the baseline of K15aa. This is to be expected as this likely represents the influence of WTG noise contribution to the measured level, noting that this is well below the minimum 40 dBA noise limit despite it still containing ambient background noise.
- Above 8 m/s wind speed the measured level at J14aa closely tracks the baseline noise of K15aa, it is within 0.7 dBA at all wind speeds, with the average difference between 8m/s and 16 m/s being only 0.4dBA.
- This result shows that at higher wind speeds the measured level at J14aa would be almost certainly completely dominated by ambient background noise.
- That K15aa and J14aa do have comparable levels of wind induced ambient background noise, noting that such minor differences (e.g. <0.7 dBA) are considered negligible and would be within the normal variability to be expected across different measurement campaigns at the same property. This only further confirms the appropriateness of using K15aa as a proxy background to assess impact at J14aa.

In summary, the comparison of K15aa and J14aa data serve to strengthen the previous findings and is not 'patently absurd'.

On page 3 of the letter Ms. Tannock states:

SLR observes in its background noise assessment that

The NZS 6808:2010 requires a set of at least 1,440 valid data points during a minimum of 10 days of continuous monitoring for analysis.

SLR does not make any qualification in relation to its interim assessment of night noise levels at J14aa notwithstanding the fact that background assessment of night noise levels at K15aa was evidently based on insufficient data points which did not accord with SLR's belief of what was required under NZS6808:2010:

No. of valid data points analysed	0 – Due to missing wind data	All time: 2796 Night-time: 1034
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The wording in the SLR interim assessment report was a general statement on recommended data capture. To explain further I have included the relevant Section 7.2.1 of NZS6808:2010 as well as the informative comment related to that section below.

7.2.1 Sound level measurements should be made during a representative range of wind speeds and directions generally expected at the wind farm, and include the normal operating range of the turbines, that is, from cut-in to rated power. For dual-speed wind turbines the measurements should include the cut-in wind speed for the higher generating capacity. The number of measurements made shall be sufficient to allow dependable correlations to be obtained between the sound levels and the wind speeds (see 7.4 and 7.5).

C7.2.1 *It is expected that a minimum of 10 days of continuous monitoring will be required to give a suitable range of data. Typically, this will give in excess of 1440 data points, which should be plotted against the appropriate corresponding wind data. It may be necessary to take further measurements if the results show:*

- (a) The distribution of data points is not uniform between minimum and maximum for each 1 m/s wind speed interval (for example there are gaps in the distributions or there is a more densely populated area of data points);*
- (b) A lack, or sparseness, for one or more wind condition which, upon examination of the sound level/wind speed relationship, may represent an important subset of data. For example, a wind condition which demonstrates a tendency towards low sound levels at high wind speeds should be adequately represented in the data set if it is significant in the annual wind 'rose'. This may require measurements to be made for extended periods of time to ensure that data includes the representative range of wind conditions; or*
- (c) Significant variation due to seasonal factors (such as insects and livestock), changes in stream levels, or contaminating sounds.*

The standard requires that noise measurements be made during a representative range of wind speeds and directions that would cover the normal operating range of WTGs.

With respect to the number of valid data points required, the standard is non-prescriptive, only requiring that the '*number of measurements shall be sufficient to allow dependable correlations to be made between sound levels and wind speeds*'. The accompanying informative comment (see C7.2.1) shows that it is '*expected that a minimum of 10 days continuous monitoring will be required to give a suitable range of data*', which would typically yield in excess of 1440 points, noting that this section of the standard has not yet considered data invalidated for other reasons (e.g. rain, excess extraneous noise, periods of wind farm not operating sufficiently).

Therefore 1440 data points is not a strict requirement but is perhaps best considered a recommendation of what would represent sufficient data coverage, provided the considerations listed in (a), (b) and (c) are fulfilled.

Ms. Tannock makes the assertion that ‘background assessment of night noise levels at K15aa was evidently based on insufficient data points which did not accord with SLR’s belief of what was required under NZS6808:2010’

The 1440 data point recommendation in the standard pertains to the “All Time” data set and not the Night Time data set. This is best evidenced in the informative comment C5.3.1 (c) of the standard which states:

(c) The differences calculated in (b) for all 10-minute time intervals in the prescribed time frame should be arithmetically averaged (there should typically be in excess of 540 data points at night – see C7.2.1);

Therefore, the night period recommendation would be in excess of 540 data points.

In summary:

- The interim monitoring at J14aa was completed from 30/10/2020 through to 1/12/2020 and covered approximately 31.8 days total. This represents 318% the minimum recommended by the standard.
- The total number of All Time monitoring intervals was 4573, of which 3018 valid data points were analysed. This represents 210% the minimum recommended by the standard.
- The total number of Night Only monitoring intervals was 1722, of which 1210 valid data points were analysed. This represents 224% the minimum recommended by the standard.

Therefore, the background assessment of night noise levels at K15aa was based on a sufficient number of data points for both time periods.

3 Summary

On the basis of:

1. The Pre-Construction Noise Assessment predictions of wind farm noise,
2. The complaints based interim compliance monitoring result during early wind farm operation,
3. The Stage 1 compliance monitoring for Elaine Wind Farm, specifically the result for reference receptor K15aa,

all indications are that the wind farm noise level at receptor J14aa is compliant with the noise limits of NZS6808:2010.

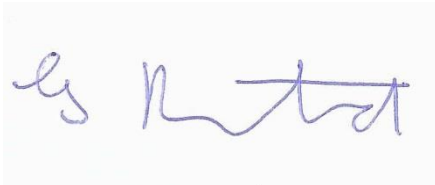
Notwithstanding the above, the actual WTG contributed noise level at J14aa could be confirmed with:

- On / Off testing at specific targeted wind conditions.
- Extrapolated predicted noise to J14aa based upon the determined WTG noise level at a closer intermediate monitoring location.

SLR is developing a specific On / Off Test Plan which is to be implemented during the course of future compliance monitoring campaigns to facilitate the above. I understand that On / Off testing has been offered to residents of receptor J14aa.

I trust that this is sufficient for your current purposes, feel free to contact me should you require any further explanation.

Yours sincerely



GUSTAF REUTERSWARD

B.E. MECH. (HONS) M.A.A.S.
TECHNICAL DIRECTOR ACOSUTICS

Checked/
Authorised by: AM