



APPENDIX H SUPPLEMENTARY NOISE ASSESSMENT

The Plains Wind Farm

Supplementary Noise Assessment

S7434C6

March 2025

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Document Title : The Plains Wind Farm
Supplementary Noise Assessment
Client : ENGIE Australia and NZ Pty Ltd
Document Reference : S7434C6
Date : March 2025
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EXECUTIVE SUMMARY

The Plains Wind Farm (the **Project**) is proposed to be located approximately 15km south of Hay. This Supplementary Noise Assessment considers the changes to the Project since the submission of the Environmental Impact Statement (**EIS**). The Noise Impact Assessment (**NIA**) was included as Appendix J of EIS.

The proposed changes that are considered in this Supplementary Noise Assessment are as follows:

- Reduction in the number of Wind Turbine Generators (**WTGs**) from 188 to 171
- A revised layout of the WTGs, with the removal of a large number of WTGs at the southern end of the site and addition of WTGs at the northern and eastern ends of the site

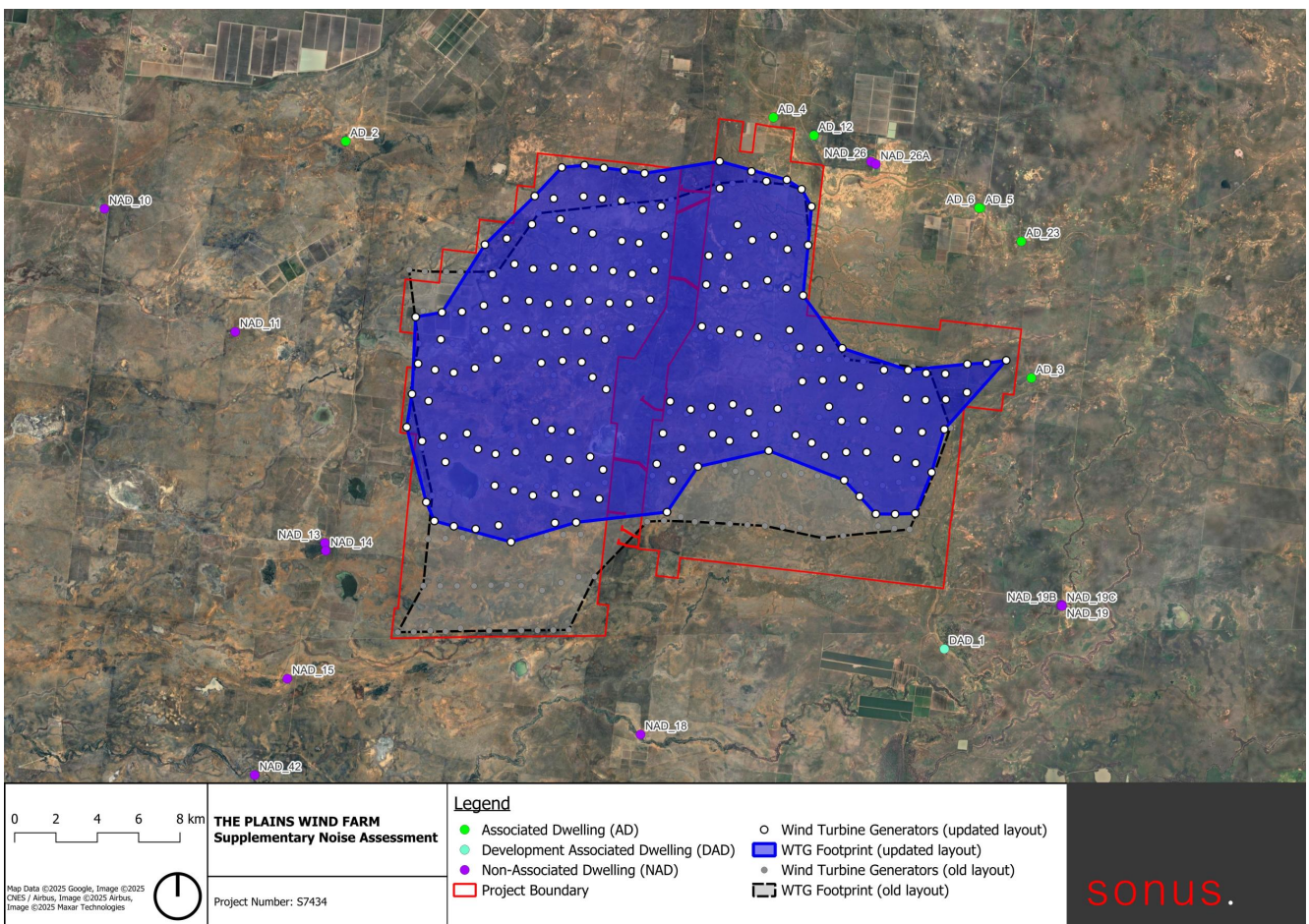


Figure 1 Proposed changes to the WTG layout

Legislative and Policy Context

The Legislative and Policy Context remains unchanged from the EIS.

Background Noise Monitoring

Background noise monitoring, which was reported in the NIA, was conducted at two non-associated residences and one associated residence; NAD_13, NAD_18 and AD_23. No additional background noise monitoring has been undertaken as part of this Supplementary Noise Impact Assessment.

Assessment Methodology

Noise sensitive receivers were identified in the NIA for the area surrounding the project. Each of these receivers have been classified as associated or not associated; the associated receivers are where the landowner has reached a written agreement in relation to the Project impacts (including noise impacts) and the not associated receivers are those where no agreement exists between the land owner and the Applicant. No changes have been made to the classification of the sensitive receivers as part of this Supplementary Noise Impact Assessment.

The noise model of the revised Project has been prepared to predict the resultant noise levels at the sensitive receivers. The noise model is the same as that described in the NIA.

Summary of Predicted Noise Impacts

Operation

The Wind Turbine Generator noise predictions show compliance with the criteria at all locations. Similar to the outcome of the NIA, no adjustment to the noise levels for annoying characteristics such as low frequency noise or tonality was warranted.

Construction and Decommissioning

The proposed changes to the WTG layout generally do not result in bringing any of the WTGs closer to non-associated noise sensitive receivers than that considered in the NIA. In this instance, the construction noise impacts are not considered to be any worse than that presented in the NIA.

It is noted that there are some associated receivers where the WTGs move closer with the revised layout, as follows:

- Associated receiver (AD_3) where the closest WTG moves from 4.6km to 1.5km with the revised layout. This would result in an approximate 10 dB(A) increase in construction noise at this location. While this is a significant increase in construction noise, as the receiver is associated with the Project the impacts would be managed accordingly in consultation with the receiver.
- Associated receiver (AD_4) where the closest WTG moves from 3.1km to 2.8km with the revised layout. This would result in an approximate 1 dB(A) increase in construction noise at this location, which does not change the outcome or conclusions of the construction noise assessment presented in the NIA.
- Associated receiver (AD_23) where the closest WTG moves from 7.6km to 5.8km with the revised layout. This would result in an approximate 2 dB(A) increase in construction noise at this location, which does not change the outcome or conclusions of the construction noise assessment presented in the NIA.

Road Noise

As the revised proposal is for the construction of fewer WTGs and the transport routes to site would generally remain unchanged, the road noise impacts remain unchanged from the NIA.

Vibration

The vibration impacts remain unchanged from the NIA.

Cumulative Noise

Nearby projects have been identified with consideration to if a cumulative noise impact may occur. Based upon the noise levels predicted for the revised project layout and the low noise generated by the closest nearby projects, it is not considered that cumulative noise from adjacent projects will result in any adverse impacts.

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GLOSSARY

Ambient noise level	The noise level of all existing noise sources in the environment (in the absence of the wind farm)
Associated dwelling	Any dwelling where the landowner has reached a written agreement in relation to the Project impacts (except where the agreement excludes noise impacts)
A-weighting	Frequency adjustment applied to measured noise levels to replicate the frequency response of the human ear
Background noise level	The ambient noise level which excludes intermittent noise sources
C-weighting	Frequency adjustment applied to measured noise levels to indicate low frequency content
dB(A)	A-weighted noise in decibels
dB(C)	C-weighted noise in decibels
EIS	Environmental Impact Statement
EPA	Environment Protection Authority
Equivalent noise level	Energy averaged noise level over a period of time
Intermittent noise sources	Noise caused by infrequently occurring events such as from aircraft, dogs barking, mobile farm machinery and the occasional vehicle movements
ISO 9613-2	International Standard <i>ISO 9613-2:1996 Acoustics – Attenuation of sound during propagation outdoors</i>
$L_{A90,time\ period}$	A-weighted noise level exceeded for 90% of defined time period. Represents the background noise level for the defined time period
$L_{Aeq,time\ period}$	A-weighted equivalent noise level over a defined time period
NIA	Noise Impact Assessment
Non-associated dwelling	Not an Associated dwelling
Sound power level	A measure of the sound energy emitted from a source of noise
The Project	The Plains Wind Farm
WHO Guidelines	<i>World Health Organisation Guidelines for Community Noise</i>
Worst-case	Operational and weather conditions which result in the highest noise level at a dwelling
WTG	Wind Turbine Generator

1 INTRODUCTION

The Plains Wind Farm (the **Project**) is proposed to be located approximately 15km south of Hay. This Supplementary Noise Assessment considers the changes to the Project since the submission of the Environmental Impact Statement (**EIS**). The Noise Impact Assessment (**NIA**) was included as Appendix J of EIS.

The proposed changes that are considered in this Supplementary Noise Assessment are as follows:

- Reduction in the number of Wind Turbine Generators (**WTGs**) from 188 to 171
- A revised layout of the WTGs, with the removal of a large number of WTGs at the southern end of the site and addition of WTGs at the northern and eastern ends of the site.
- Non-associated receivers NAD_12 and NAD_23 have become associated receivers AD_12 and AD_23 respectively.

The updated project layout is shown in Figure 2.

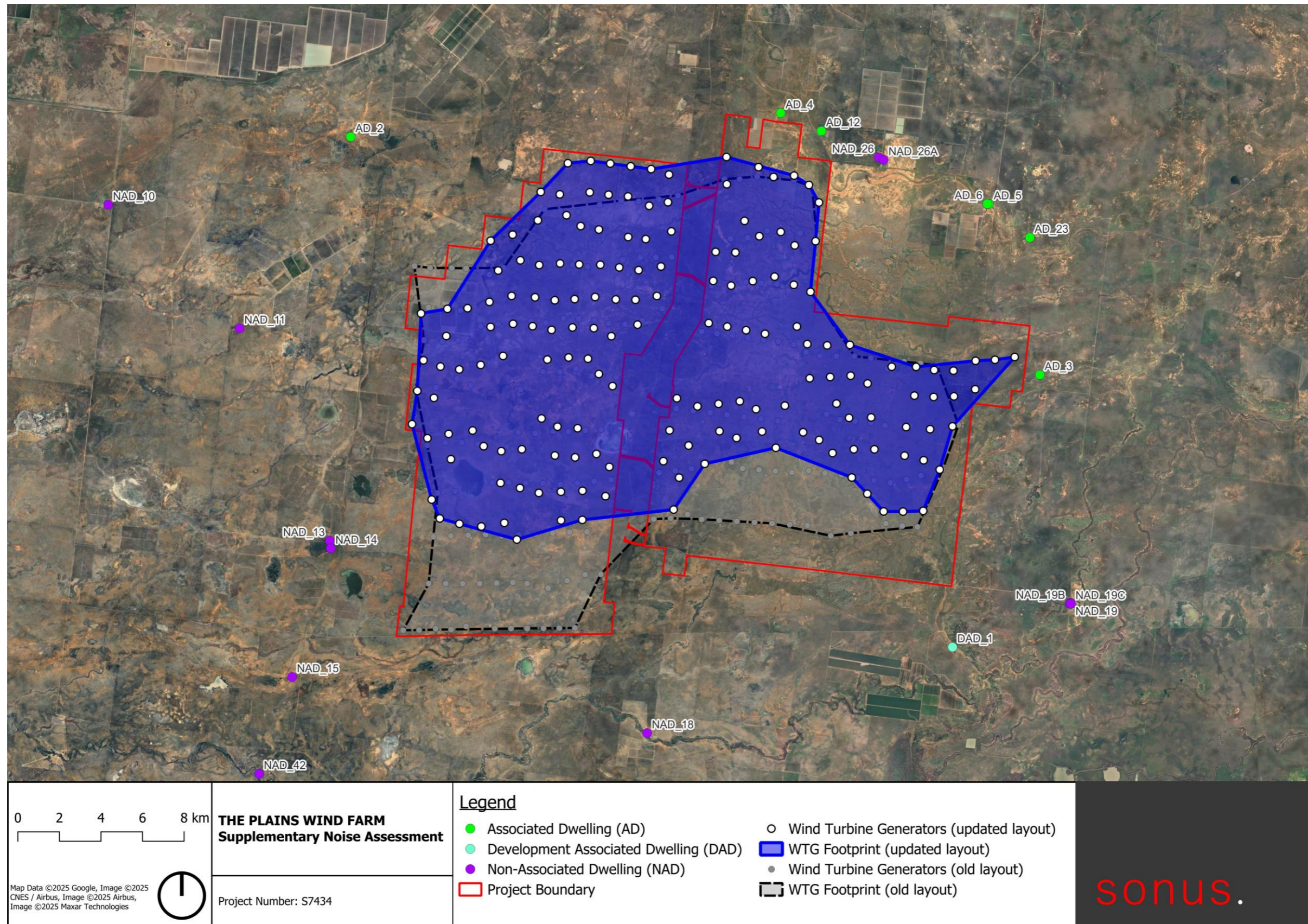


Figure 2: Project Layout

2 LEGISLATIVE AND POLICY CONTEXT

The Legislative and Policy Context remains unchanged from the EIS.

3 BACKGROUND NOISE MONITORING

Details of background noise monitoring have been provided in the NIA. A summary of these results has been provided for reference.

3.1 Background Noise Levels

Background noise monitoring, which was reported in the NIA, was conducted at two non-associated residences and one associated residence; NAD_13, NAD_18 and AD_23. No additional background noise monitoring has been undertaken as part of this Supplementary Noise Impact Assessment.

3.2 Criteria

Table 1 summarises the project criteria at each residence surrounding the wind farm, based on the representative logging locations. In accordance with the Bulletin, the criteria have been determined as the higher of 35 dB(A) or the background noise level plus 5 dB(A).

Table 1: Wind turbine noise criteria (dB(A)) at non-associated residences

Representative Logging Location	Residence ID	Criteria (dB(A)) for Integer Hub Height (180m) Wind Speed										
		3m/s	4m/s	5m/s	6m/s	7m/s	8m/s	9m/s	10m/s	11m/s	12m/s	
NAD_13	NAD_10, NAD_11, NAD_13, NAD_14, NAD_15, NAD_42	35	35	35	35	35	35	35	35	35	35	36
NAD_18	NAD_16, NAD_18, NAD_28, NAD_29, NAD_30, NAD_32, NAD_38, NAD_39, NAD_40, NAD_41, NAD_43	35	35	35	35	35	35	35	35	35	35	35
AD_23	NAD_19, NAD_19B, NAD_19C, NAD_26, NAD_26A, NAD_33, NAD_34, NAD_35, NAD_36, NAD_37	35	35	35	35	35	35	35	35	35	35	35

4 ASSESSMENT METHODOLOGY

4.1 Noise Sensitive Receivers

Noise sensitive receivers were identified in the NIA for the area surrounding the project. Each of these receivers have been classified as associated or not associated; the associated receivers are where the landowner has reached a written agreement in relation to the Project impacts (including noise impacts) and the not associated receivers are those where no agreement exists between the land owner and the Applicant. The full list of receivers is shown in Appendix A, however no changes have been made to the classification of the sensitive receivers as part of this Supplementary Noise Impact Assessment.

Noise sensitive areas within the national parks (e.g. camp grounds and picnic areas) have not been identified, therefore for the purpose of this assessment the noise level at the closest boundary of each national park has been considered. This is consistent with the approach adopted for the NIA.

4.2 Noise Model

The noise model of the revised Project has been prepared to predict the resultant noise levels at the sensitive receivers. The noise model is the same as that described in the NIA.

4.3 Noise Sources

Final selections for the operational noise sources have yet to be finalised, however the maximum capacities allow for general conservative estimates to be made at what the noise sources may emit. Table 2 shows the assumed noise levels for the operational noise sources. The sound power levels for individual items have not changed from that adopted for the NIA. The only change from the NIA is a reduction in total number of WTGs, and removal of the BESS.

Table 2: Operational Noise Sources

Operational Section	Noise Source	Quantity/Capacity	Sound Power Level
WTGs	WTG	171x 7.2 MW units	107 dB(A) each

5 POTENTIAL NOISE IMPACTS

5.1 Compliance at Receivers

The noise from WTGs has been predicted for the worst case wind speed¹ (12 m/s), and compared against the 35 dB(A) baseline criterion. These results are shown in Table 3 in Appendix A, with the highest predicted noise level of 26 dB(A) at a Non-Associated Dwelling (NAD_26, 3600m from nearest turbine), 31 dB(A) at an Associated Dwelling (AD_3, 1500m from nearest turbine) and less than 20 dB(A) at the nearest national parks. Noise contours are shown in Appendix B. The results show compliance with the criteria at all locations.

5.2 Special Noise Characteristics

The special noise characteristics have been assessed below as a result of the change in layout. As per the outcome of the NIA, no adjustment to the noise levels for annoying characteristics such as low frequency noise or tonality was warranted.

5.2.1 Tonality

The penalty for tonality only applies if the tone from the wind farm is audible at the receiver location. However, if the turbine is not tonal itself, then the WTG noise at the receiver cannot be tonal. The one-third octave bands of the candidate turbine used for modelling have been reviewed against the methodology of ISO 1996.2. The one-third octave band data has identified that no penalty for the presence of tonal characteristics is warranted.

5.2.2 Low Frequency Noise

C-Weighted predictions have been made to assess if a penalty is required for the low frequency noise content. The highest C-weighted prediction made is at AD_3, AD_4 and AD_4, which is predicted to be 49 dB(C). As this prediction is lower than the 60 dB(C) noise level required for a penalty, no penalty has been applied.

¹ At higher wind speed the turbines will make equal or less noise, while the background environment will be louder.

5.3 Construction and Decommissioning

The results of the construction and decommissioning noise impact assessment are largely unchanged from the NIA. The proposed changes to the layout generally do not result in reducing the distance between WTGs and non-associated noise sensitive receivers. In this instance, the construction noise impacts are not considered to be any worse than that presented in the NIA.

It is noted that there are some associated receivers where the WTGs move closer with the revised layout, as follows:

- Associated receiver (AD_3) where the closest WTG moves from 4.6km to 1.5km with the revised layout. This would result in an approximate 10 dB(A) increase in construction noise at this location. While this is a significant increase in construction noise, as the receiver is associated with the Project the impacts would be managed accordingly in consultation with the receiver.
- Associated receiver (AD_4) where the closest WTG moves from 3.1km to 2.8km with the revised layout. This would result in an approximate 1 dB(A) increase in construction noise at this location, which does not change the outcome or conclusions of the construction noise assessment presented in the NIA.
- Associated receiver (AD_23) where the closest WTG moves from 7.6km to 5.8km with the revised layout. This would result in an approximate 2 dB(A) increase in construction noise at this location, which does not change the outcome or conclusions of the construction noise assessment presented in the NIA.

5.4 Road Noise

As the revised proposal is for the construction of fewer WTGs and the transport routes to site would generally remain unchanged, the road noise impacts remain unchanged from the NIA.

5.5 Vibration

The vibration impacts remain unchanged from the NIA.

6 CUMULATIVE IMPACTS

The scale of the changes of the revised WTG layout (i.e. relative distances) is minor in comparison to the distances between most other projects, and therefore the cumulative impacts are as per the NIA.

7 CONCLUSION

7.1 Operation

The Wind Turbine Generator noise predictions for the revised WTG layout show compliance with the criteria at all locations. No adjustments for annoying characteristics have been found to be warranted.

The assessment results align with the conclusions from the Noise Impact Assessment.

7.2 Construction and Decommissioning

The proposed layout changes do not result in reducing the distance between WTGs and non-associated noise sensitive receivers, and therefore reference is made to the Noise Impact Assessment.

7.3 Road Noise

The road noise impacts remain unchanged from the Noise Impact Assessment.

7.4 Vibration

The vibration impacts remain unchanged from the Noise Impact Assessment.

7.5 Cumulative Noise

Cumulative noise impacts were reconsidered as part of the revised WTG layout, however the outcome is no change from the conclusions drawn in the Noise Impact Assessment in relation to cumulative noise impacts.

APPENDIX A: NOISE SENSITIVE RECEIVERS

Table 3: Noise Sensitive Receivers

ID Code	Associated or Non-Associated	Coordinates (GDA94 / MGA Zone 55)		Predicted Noise Level [dB(A)]	Compliance	Closest Turbine	Approximate Distance to Closest Turbine (m)
		Easting	Northing				
AD_1	Associated	283451	6172764	<20	Compliant	150	13400
AD_2	Associated	283303	6165478	21	Compliant	155	8400
AD_3	Associated	316482	6154021	31	Compliant	170	1500
AD_4	Associated	304002	6166626	29	Compliant	157	2800
AD_5	Associated	314025	6162245	23	Compliant	170	7500
AD_6	Associated	313950	6162252	23	Compliant	170	7500
AD_12	Associated	305963	6165761	29	Compliant	158	2500
AD_23	Associated	315996	6160630	23	Compliant	170	5800
DAD_1	Non-Associated	312276	6140914	21	Compliant	148	6700
NAD_10	Non-Associated	271628	6162208	<20	Compliant	81	15900
NAD_11	Non-Associated	277954	6156256	20	Compliant	81	8800
NAD_13	Non-Associated	282290	6146038	23	Compliant	118	5300
NAD_14	Non-Associated	282338	6145665	23	Compliant	118	5400
NAD_15	Non-Associated	280477	6139476	<20	Compliant	119	10400
NAD_16	Non-Associated	295341	6132424	<20	Compliant	126	14300
NAD_18	Non-Associated	297571	6136774	<20	Compliant	117	10700
NAD_19	Non-Associated	317961	6143051	<20	Compliant	148	8400
NAD_19B	Non-Associated	317928	6143012	<20	Compliant	148	8400
NAD_19C	Non-Associated	317968	6142997	<20	Compliant	148	8400
NAD_26	Non-Associated	308724	6164489	26	Compliant	162	3600
NAD_26A	Non-Associated	308956	6164369	26	Compliant	162	3700
NAD_28	Non-Associated	295399	6131861	<20	Compliant	126	14800
NAD_29	Non-Associated	294757	6130904	<20	Compliant	126	15600
NAD_30	Non-Associated	295983	6131496	<20	Compliant	126	15300
NAD_32	Non-Associated	293158	6131435	<20	Compliant	126	14800
NAD_33	Non-Associated	287293	6175117	<20	Compliant	150	12700
NAD_34	Non-Associated	287708	6175204	<20	Compliant	150	12500
NAD_35	Non-Associated	303941	6176135	<20	Compliant	1	11900
NAD_36	Non-Associated	303092	6177487	<20	Compliant	1	13100
NAD_37	Non-Associated	304444	6177536	<20	Compliant	1	13400
NAD_38	Non-Associated	310438	6132424	<20	Compliant	147	15000
NAD_39	Non-Associated	306257	6132699	<20	Compliant	146	15000
NAD_40	Non-Associated	305812	6132862	<20	Compliant	146	14900
NAD_41	Non-Associated	297727	6128931	<20	Compliant	126	18300
NAD_42	Non-Associated	278894	6134815	<20	Compliant	119	15100
NAD_43	Non-Associated	295591	6132229	<20	Compliant	126	14500

APPENDIX B: WIND TURBINE GENERATOR NOISE CONTOURS

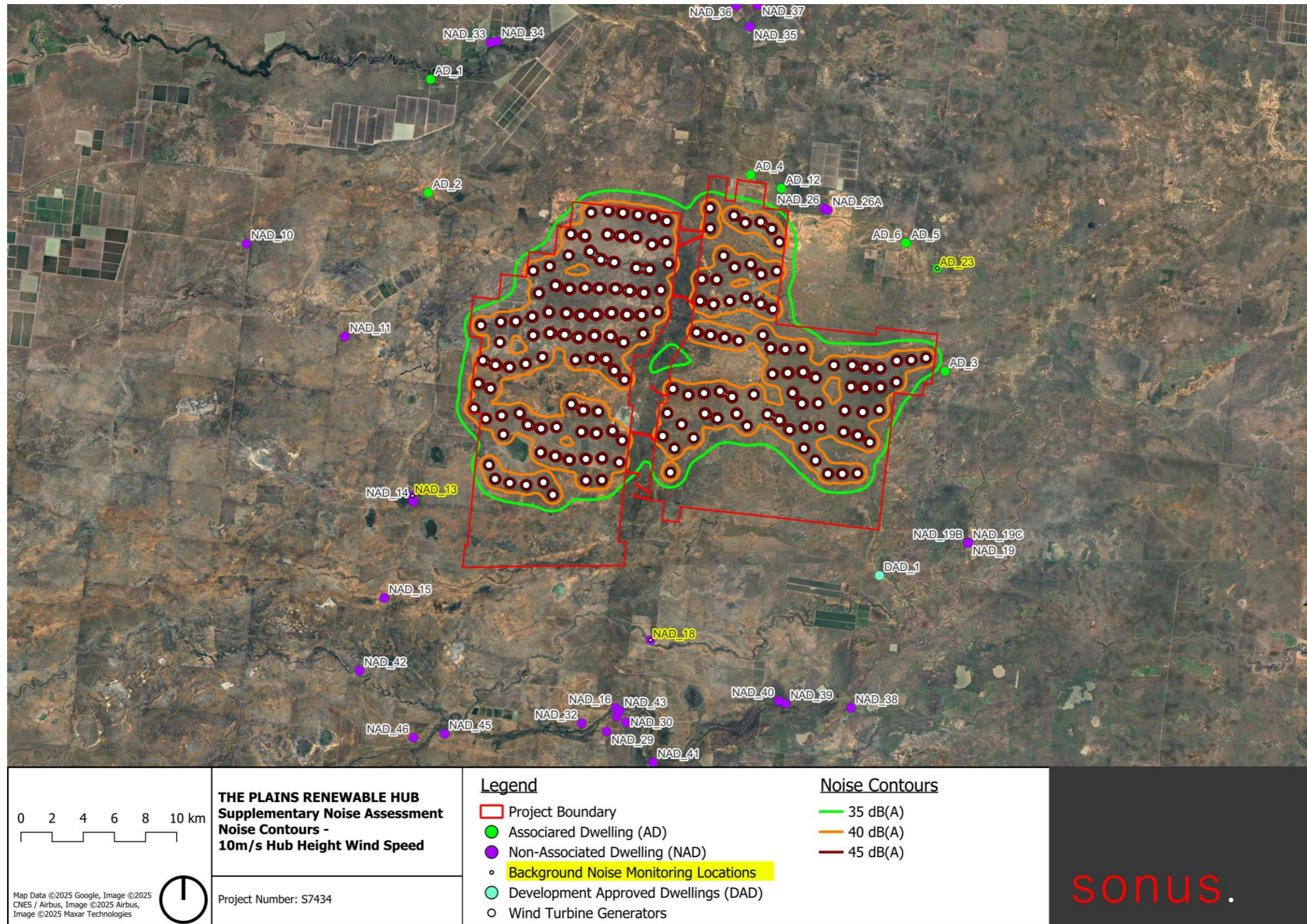


Figure 3: Wind Turbine Generator Noise Contours