

20 June 2019

WM Project Number: 18156
Our Ref: 18156 Ltr 200619

Adnan Voloder
Boral Land & Property Group
PO Box 6041
NORTH RYDE NSW 2113

Dear Adnan

Re: Dunmore Lakes Sand Extraction Project Modification 2 - Responses to Noise Submissions

Thank you for providing Wilkinson Murray with submissions relating to noise impacts from this proposal. Our responses to these submissions are detailed in the following sections.

In addition to providing responses to the noise-related submissions for the proposal, we have provided several operational noise contour plots in Appendix A. These plots show the envelope of operational noise contours during the daytime and morning shoulder period under temperature inversions and wind enhancement.

I trust this information is sufficient. Please contact us if you have any further queries.

Yours faithfully

WILKINSON MURRAY



Nic Hall
Manager (Wollongong)

ENVIRONMENT PROTECTION AUTHORITY

The NSW Environment Protection Authority (EPA) has provided several noise-related submissions in a letter to the Department of Planning and Environment (DP&E), dated 23 May 2019. These submissions and relevant responses are detailed below.

Submission:

Clarification of the working times for rehabilitation activities is required.

The proponent should clarify the time periods when deliveries of infill material will occur. The current EPL allows importation of fill material between 5am and midnight (EPL condition L4). The noise report has assessed rehabilitation, which included importation and distribution of fill material only between 7am and 6pm. If rehabilitation occurs outside of the 7am to 6pm period, as currently permitted by the EPL, the predicted noise levels would exceed the Project Noise Trigger Levels (PNTLs) at R3, R11-R15, R17 and R18 during the evening and/or night time periods.

The noise report would clarify the time periods and infill deliveries and rehabilitation will occur and update the noise report accordingly.

Response:

Delivery of infill material and rehabilitation activities are both limited to the daytime (7:00am – 6:00pm) period only for the proposed Stage 5.

Submission:

Further consideration of existing and proposed operations should be provided in the noise report.

The report should consider the combined noise level of existing and proposed activities at all potentially affected receivers during each time period, for each scenario/activity as part of the assessment.

The noise limits in the EPL and PTNLs are applicable to the total noise level from all operations and activities undertaken at the premises. The noise predictions do not currently provide predictions which include the existing processing and dispatch activities. Chapter 6.5.4 of the noise impact assessment report addresses existing and proposed noise sources and contains a number of points which require additional clarification as follows:

- Noise level predictions in Tables 6-9 to 6-11 do not include the existing noise sources that will continue to operate during the proposed modification across multiple time periods.*
- The report states that because the existing noise levels from the processing facility are 10 dB below the PNTLs, it would have a negligible contribution to the operation's total noise levels. However, Section 6.5.4 states that the highest noise level from the proposal at R20 is 34 dBA, which is less than the reported existing level of (at most) 38 dBA at R20. Therefore, the contribution of the existing activities cannot be considered a negligible contribution to the site's noise emission level.*
- Chapter 6.5.4 states that the highest noise level from the proposed activities is $L_{Aeq,15min}$ 34 dB which inconsistent with the noise levels presented in Table 6-9 to 6-11 where the highest predicted noise level from the proposal at R20 is $L_{Aeq,15min}$ 32 dB.*

Response:

Chapter 6.5.4 incorrectly states that the highest predicted $L_{Aeq,15min}$ noise level at R20 due to the proposal is 34 dBA. As correctly identified by the EPA submission, the highest predicted $L_{Aeq,15min}$ noise level at R20 due to the proposal is 32 dBA; less than what was reported.

The noise level due to the existing site operations at R20 was estimated to be no higher than 38 dBA. This was based on a site survey at R20 where the existing site operations were inaudible, and the ambient $L_{A90,15min}$ was 48 dBA. Estimating the noise level from existing operations at 38 dBA was very conservative. Due to noise from the nearby Princes Highway, it is very difficult to accurately determine the noise level from existing site operations at R20.

However, they are likely to be closer to 30 dBA than 38 dBA, and they will be lower at receivers further south of R20 i.e. closer to Stage 5A and 5B. Despite the “numerical” contribution of the existing site operations to total operational noise levels at receivers near the proposal, the existing site operations are likely to be inaudible at these receivers. Therefore, in practical terms, these noise levels are negligible.

To further demonstrate that cumulative noise levels from both the existing and proposed operations would comply with the PNTL, Table 1 through Table 3 show the combined $L_{Aeq,15min}$ noise levels at sensitive receivers assuming that the noise level from existing site operations is 38 dBA at all sensitive receivers. This is of course not the case, and the data in Table 1 through Table 3 should be used for no other purpose than to demonstrate that total noise levels from existing and proposed operations would comply with the PNTL.

Table 1 Predicted Daytime $L_{Aeq,15min}$ "Cumulative" Operational Noise Levels

Receiver	Project Noise Trigger Level	Predicted Noise Level (dBA)											Complies?
		5A West OB	5A West RM	5A East OB	5A East RM	5B North OB	5B North RM	5B South OB	5B South RM	5A Rehab	5B Rehab	5A / 5B Transition	
R1	n/a	55	47	57	48	43	38	43	38	56	43	48	n/a
R2	n/a	38	38	38	38	56	47	55	45	45	53	49	n/a
R3	48	47	39	44	41	39	38	40	38	46	39	41	Yes
R4	47	39	38	38	38	39	38	40	38	39	39	39	Yes
R5	47	39	38	38	38	39	38	41	38	39	39	39	Yes
R6	47	39	38	38	38	40	38	41	38	39	39	39	Yes
R7	47	39	38	38	38	40	38	41	38	39	39	39	Yes
R8	47	39	38	38	38	40	38	41	38	39	39	39	Yes
R9	47	38	38	38	38	40	38	41	38	39	39	39	Yes
R10	47	38	38	38	38	40	38	41	38	39	39	39	Yes
R11	48	38	38	38	38	41	39	42	39	39	42	42	Yes
R12	48	38	38	38	38	43	39	44	39	39	44	44	Yes
R13	48	38	38	38	38	44	40	44	39	39	44	44	Yes
R14	48	38	38	38	38	47	42	46	40	40	48	48	Yes
R15	48	38	38	38	38	46	41	45	39	39	46	46	Yes
R16	48	38	38	38	38	42	38	42	38	38	41	40	Yes
R17	48	39	38	38	38	47	38	47	38	38	44	39	Yes
R18	48	39	38	38	38	48	38	48	38	38	47	38	Yes
R19	44	40	39	38	38	40	38	40	38	38	39	38	Yes
R20	49	39	38	38	38	39	38	39	38	39	39	38	Yes

Table 2 Predicted Morning Shoulder L_{Aeq,15min} "Cumulative" Operational Noise Levels – Temperature Inversion

Receiver	Project Noise Trigger Level	Predicted Noise Level (dBA)					Complies?
		5A West RM	5A East RM	5B North RM	5B South RM	5A / 5B Transition	
R1	n/a	49	49	39	39	49	n/a
R2	n/a	45	45	48	46	48	n/a
R3	48	40	42	38	39	42	Yes
R4	47	38	38	38	38	38	Yes
R5	47	38	38	38	39	38	Yes
R6	47	38	38	38	39	38	Yes
R7	47	38	38	38	39	38	Yes
R8	47	38	38	38	39	38	Yes
R9	47	38	38	39	39	39	Yes
R10	47	38	38	39	39	39	Yes
R11	48	38	38	40	39	40	Yes
R12	48	38	38	40	40	40	Yes
R13	48	38	38	41	40	41	Yes
R14	48	38	38	44	41	44	Yes
R15	48	38	38	43	40	43	Yes
R16	48	38	38	39	38	39	Yes
R17	48	38	38	39	38	39	Yes
R18	48	38	38	38	38	38	Yes
R19	44	40	38	38	38	38	Yes
R20	49	39	38	38	38	38	Yes

Table 3 Predicted Morning Shoulder L_{Aeq,15min} "Cumulative" Operational Noise Levels – Wind Enhancing

Receiver	Project Noise Trigger Level	Predicted Noise Level (dBA)					Complies?
		5A West RM	5A East RM	5B North RM	5B South RM	5A / 5B Transition	
R1	n/a	49	50	39	39	50	n/a
R2	n/a	45	45	48	46	48	n/a
R3	48	41	42	38	39	42	Yes
R4	47	38	38	38	39	38	Yes
R5	47	38	38	38	39	39	Yes
R6	47	38	38	38	39	39	Yes
R7	47	38	38	38	39	39	Yes
R8	47	38	38	38	39	39	Yes
R9	47	38	38	39	39	39	Yes
R10	47	38	38	39	39	39	Yes

Receiver	Project Noise Trigger Level	Predicted Noise Level (dBA)					Complies?
		5A West RM	5A East RM	5B North RM	5B South RM	5A / 5B Transition	
R11	48	38	38	40	40	40	Yes
R12	48	38	38	41	40	41	Yes
R13	48	38	38	41	40	41	Yes
R14	48	38	38	44	41	44	Yes
R15	48	38	38	44	41	44	Yes
R16	48	38	38	39	38	39	Yes
R17	48	38	38	39	38	39	Yes
R18	48	38	38	38	38	38	Yes
R19	44	40	38	38	38	38	Yes
R20	49	39	38	38	38	38	Yes

Submission:

Construction activities associated with the internal access and haul roads should be assessed according to the Noise Policy for Industry (NPfI).

The construction of the road to access the Stage 5A and 5B areas, which will be used by trucks and other vehicles on a regular basis, should be considered as part of the operational assessment. The ICNG is not applicable to construction activities associated with quarrying and mining. Since the construction of the internal roads connecting Stage 5A and 5B will be used by trucks and other vehicles as part of typical operations, their construction should be considered under the NPfI. Other construction activities associated with the pipeline, pumps and site office can be considered under the ICNG, due to their temporary nature and their operation having negligible noise impacts.

Response:

The construction of the access/haul road is expected to be a one-off short duration construction activity to establish critical project infrastructure. Accordingly, Wilkinson Murray considers the ICNG appropriate for the construction of the road. Notwithstanding, per the EPA's request, the predicted $L_{Aeq,15min}$ noise levels at sensitive receivers during the construction of the access/haul road have been assessed against the established PNTL. Table 4 indicates that the predicted noise levels at sensitive receivers during the construction of the access/haul road comply with the PTNL.

Table 4 Predicted $L_{Aeq,15min}$ Noise Levels during Road Construction

Receiver	Predicted Construction Noise Level (dBA)	Daytime PNTL (dBA)	Complies?
R1	58	n/a	n/a
R2	29	n/a	n/a
R3	47	48	Yes
R4	38	47	Yes
R5	37	47	Yes

Receiver	Predicted Construction Noise Level (dBA)	Daytime PNTL (dBA)	Complies?
R6	36	47	Yes
R7	36	47	Yes
R8	36	47	Yes
R9	35	47	Yes
R10	35	47	Yes
R11	<30	48	Yes
R12	<30	48	Yes
R13	<30	48	Yes
R14	<30	48	Yes
R15	<30	48	Yes
R16	<30	48	Yes
R17	<30	48	Yes
R18	<30	48	Yes
R19	35	44	Yes
R20	35	49	Yes

Wilkinson Murray acknowledges that the ICNG includes stipulations that it not be used for construction activities associated with quarrying and mining. Although this guidance is issued in the ICNG without caveats, Wilkinson Murray believes that the intent of this restriction is to avoid the ICNG being applied to activities that are considered a normal part of the operation of a mine or quarry, such as the construction of bunds and haul roads. The construction of the access/haul road for the Proposal would be a one-off, discrete activity and would not be ongoing in nature in the same way that the use of a haul road for a mine or quarry might be. Therefore, Wilkinson Murray considers that assessing the construction of the access/haul road under the ICNG is consistent with the intent of the guideline.

It is also noted that the last sentence in the EPA's submission regarding construction noise does not appear to be consistent with the ICNG, or other NSW Government guidelines and policies relating to noise. The last sentence of the submission suggests that the level of operational noise impact from a particular source determines the applicability of the ICNG to the construction of that source. This is in no way supported by the ICNG or other publicly available noise guidelines and policies in NSW. Operational noise impacts are irrelevant in the assessment of construction noise. Additionally, the level of noise impact from construction activities does not determine the assessment framework under which those impacts are considered.

Submission:

Corrections for Annoying Characteristics

The noise report should provide an assessment of the potential for annoying characteristics according to the NPfI Fact Sheet C for all scenarios and activities assessed using the NPfI.

Response:

All operational noise sources associated with the proposal have been considered for their potential to exhibit annoying characteristics in accordance with Fact Sheet C of the NPfI. No operational noise sources are considered likely to exhibit annoying characteristics.

ROADS AND MARITIME SERVICES (PROPERTY)

The NSW Roads and Maritime Services (RMS) has provided a submission to DP&E in a letter dated 20 May 2019. The submission notes that RMS is the owner of Lot 1 DP 1116072, known as 79 Fig Hill Lane Dunmore and that development consent has been granted by Shellharbour City Council for a new dwelling on the land.

79 Fig Hill Lane is located immediately adjacent to the Stage 5B area of the proposal, and the location of the approved dwelling is in the northern part of the property.

Assessment of Noise Impacts at 79 Fig Hill Lane

An assessment of operational noise impacts on the approved dwelling at 79 Fig Hill Lane is presented herein.

Project Noise Trigger Levels

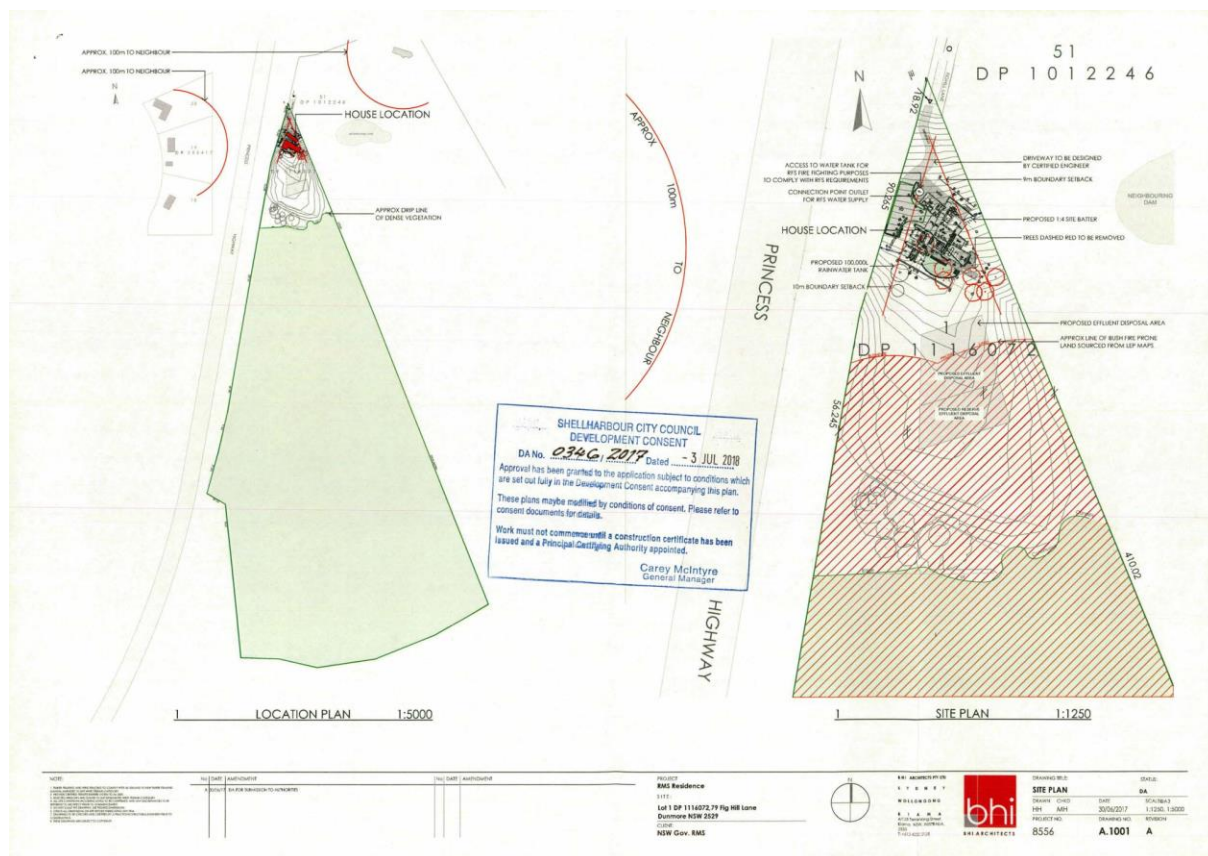
A detailed site visit has not been conducted at 79 Fig Hill Lane, however the existing ambient noise environment at this location is likely to be similar to that of R11-R18. Accordingly, the Project Noise Trigger Levels (PNTL) established for R11-R18 are considered appropriate for 79 Fig Hill Lane and are presented in Table 5.

Table 5 PNTL – 79 Fig Hill Lane

Receiver	PNTL $L_{Aeq,15min}$			
	Morning Shoulder	Day	Evening	Night
79 Fig Hill Lane	48	48	43	38

Assessment of Noise Impacts

The predicted operational noise levels at 79 Fig Hill Lane are presented in Table 6. Noise levels have been predicted at the most affected point on or within the property boundary, but not more than 30 metres from the approved dwelling. The location of the approved dwelling is shown in Figure 0-1.

Figure 0-1 RMS Property

Source: RMS Submission Letter

Table 6 Predicted $L_{Aeq,15min}$ Operational Noise Levels at 79 Fig Hill Lane

Time Period	Meteorological Conditions	Scenario	Predicted Noise Level	PNTL	Complies?	Exceedance
AM Shoulder	F-Class stability 0 m/s wind	5A West RM	<20	48	Yes	-
		5A East RM	<20		Yes	-
		5B North RM	54		No	6 dB
		5B South RM	42		Yes	-
		5A / 5B Transition	54		No	6 dB
	D-class stability 3 m/s wind	5A West RM	<20		Yes	-
		5A East RM	<20		Yes	-
		5B North RM	54		No	6 dB
		5B South RM	42		Yes	-
		5A / 5B Transition	54		No	6 dB
Daytime	D-class stability 0 m/s wind	5A West OB	<20		Yes	-
		5A West RM	<20		Yes	-
		5A East OB	<20		Yes	-

5A East RM	<20	Yes	-
5B North OB	59	No	11 dB
5B North RM	53	No	5 dB
5B South OB	53	No	5 dB
5B South RM	39	Yes	-
5A Rehab	39	Yes	-
5B Rehab	64	No	16 dB
5A / 5B Transition	54	No	6 dB

Review of Table 6 indicates that the predicted operational noise levels at 79 Fig Hill Lane generally comply with the PNTL during operations in Stage 5A, however exceed the PNTL during operations in Stage 5B. The predicted exceedances range from 5 dB to 16 dB.

Noise Mitigation Options

During material removal scenarios, where the dredge and pumps are the only significant noise sources in proximity to 79 Fig Hill Lane, the predicted noise levels exceed the PNTL by 5-6 dB. More detailed analysis of the results indicates that the dredge dominates the receiver noise levels during these scenarios. The modelled sound power level of the dredge is 104 dBA, which is based on the dredge used in the existing site operations. Selecting a dredge with a sound power level of no more than 98 dBA would mitigate the predicted exceedances for scenarios where this is the primary noise source. It is considered likely that a sound power level of 98 dBA for a dredge is achievable.

For scenarios involving trucks and earthmoving equipment being operated in close proximity to the approved dwelling at 79 Fig Hill Lane, such as during both the overburden removal and rehabilitation of the northern parts of Stage 5B, the predicted noise levels exceed the PNTL by more than 10 dBA. The adopted sound power levels for trucks and earthmoving equipment are toward the lower end of the range of typical values for such equipment, and it is not considered feasible for the equipment required for these activities to have significantly lower sound power levels than those values already used in this assessment.

Accordingly, there is limited opportunity to mitigate these noise levels through noise control at the source. Controlling noise at 79 Fig Hill Lane during these earthmoving activities through controls in the noise transmission path is also not feasible. The approved dwelling at 79 Fig Hill Lane is located immediately adjacent to the northern part of Stage 5B. There is very little physical separation between the dwelling and the proposal site. Constructing earth mounds to control noise levels would consume a significant portion of the Stage 5B area.

Residual Impacts

With the implementation of all feasible and reasonable mitigation, operational noise levels from the proposal are predicted to exceed the PNTL at 79 Fig Hill Lane by up to 16 dB and would also exceed the recommended amenity noise level. In accordance with the NPFI, this is considered a "significant" residual impact.

Under the *Voluntary Land Acquisition and Mitigation Policy for State Significant Mining, Petroleum and Extractive Industry Developments* (the "VLAMP"), if a development's predicted $L_{Aeq,15min}$ noise levels exceed the PNTL by more than 5 dBA and the total cumulative industrial noise level exceeds the daytime

or evening recommended amenity noise levels in Table 2.2 of the NPfI at any residence on privately owned land, then the noise impacts at that receiver are considered to be "significant".

Negotiated agreements, which are private contracts between applicants and landowners, are the preferred mechanism for managing exceedances of assessment criteria under the VLAMP. Therefore, Boral should attempt to enter into a negotiated agreement with RMS that addresses the noise impacts on 79 Fig Hill Lane and satisfies the requirements of the VLAMP.

In the event that a negotiated agreement cannot be reached, the consent authority may apply voluntary land acquisition rights to the 79 Fig Hill Lane.

It should be noted however that whilst exceedances of the noise criteria do occur at this allotment, this is on the assumption that there will be a dwelling established at the site. At this point in time, the RMS in their submission, have not indicated an intention to develop the site, rather are seeking to dispose of the allotment with an approval for a dwelling. It is not clear when or if this may occur.

As a result, it cannot be definitively ascertained as to whether or not a dwelling will be existing on the allotment, at the time works commence at Stage 5B, for an impact at the dwelling to be experienced. Therefore, the exceedances identified above need to be considered whilst having regard to the possibility that no impact may actually arise as a result of the proposal proceeding, as no disposal or works commencement date can be identified in the foreseeable future.

71 FIG HILL LANE

At the time of preparing the noise impact assessment for the EIS, Wilkinson Murray were advised that the dwelling at 71 Fig Hill Lane was derelict and uninhabited, with no valid development consent. In a letter to DP&E, dated 5 June 2019, a submission was made by representatives of the owners of 71 Fig Hill Lane. The submission advised that there is indeed a valid consent for the dwelling at this property, and that this dwelling should be considered in the noise assessment.

Assessment of Noise Impacts at 71 Fig Hill Lane

An assessment of operational noise impacts on the approved dwelling at 71 Fig Hill Lane is presented herein.

Project Noise Trigger Levels

A detailed site visit has not been conducted at 71 Fig Hill Lane, however the existing ambient noise environment at this location is likely to be similar to that of R3. Accordingly, the Project Noise Trigger Levels (PNTL) established for R3 are considered appropriate for 71 Fig Hill Lane and are presented in Table 7.

Table 7 PNTL – 71 Fig Hill Lane

Receiver	PNTL $L_{Aeq,15min}$			
	Morning Shoulder	Day	Evening	Night
79 Fig Hill Lane	48	48	43	38

Assessment of Noise Impacts

The predicted operational noise levels at 71 Fig Hill Lane are presented in Table 8. Review of Table 8 indicates that the predicted operational noise levels at 71 Fig Hill Lane comply with the PNTL during all operational scenarios except for overburden removal in Stage 5B. The predicted exceedances range from 1 dB to 2 dB.

Table 8 Predicted $L_{Aeq,15min}$ Operational Noise Levels at 71 Fig Hill Lane

Time Period	Meteorological Conditions	Scenario	Predicted Noise Level	PNTL	Complies?	Exceedance
AM Shoulder	F-Class stability 0 m/s wind	5A West RM	23	48	Yes	-
		5A East RM	25		Yes	-
		5B North RM	44		Yes	-
		5B South RM	39		Yes	-
		5A / 5B Transition	44		Yes	-
	D-class stability 3 m/s wind	5A West RM	24		Yes	-
		5A East RM	26		Yes	-
		5B North RM	44		Yes	-
		5B South RM	40		Yes	-
		5A / 5B Transition	45		Yes	-
Daytime	D-class stability 0 m/s wind	5A West OB	25	48	Yes	-
		5A West RM	21		Yes	-
		5A East OB	28		Yes	-
		5A East RM	23		Yes	-
		5B North OB	50		No	2 dB
		5B North RM	41		Yes	-
		5B South OB	49		No	1 dB
		5B South RM	36		Yes	-
		5A Rehab	37		Yes	-
		5B Rehab	47		Yes	-
		5A / 5B Transition	44		Yes	-

Noise Mitigation Options

During the Stage 5B overburden removal scenarios, where the predicted noise levels exceed the PNTL at 71 Fig Hill Lane, noise levels at the receiver are dominated by earthmoving equipment. The adopted sound power levels for earthmoving equipment are toward the lower end of the range of typical values for such equipment, and it is not considered feasible for the equipment required for these activities to have significantly lower sound power levels than those values already used in this assessment.

Accordingly, there is limited opportunity to mitigate these noise levels through noise control at the source. Additionally, due to the dwelling at 71 Fig Hill Lane being located at a significantly higher elevation than the Stage 5B area, receiver noise levels cannot reasonably be mitigated through the use

of noise bunds. In summary, no mitigation options deemed reasonable and feasible are identified to control operational noise levels at 71 Fig Hill Lane.

It should be noted that the submitter has identified in their submission, there is no intention of developing the site for the purposes of a dwelling.

Residual Impacts

With the implementation of all feasible and reasonable mitigation, operational noise levels from the proposal are predicted to exceed the PNTL at 71 Fig Hill Lane by up to 2 dB. In accordance with the NPfI, this is considered a “negligible” residual impact.

APPENDIX A

OPERATIONAL NOISE CONTOUR PLOTS

Figure A-1 **L_{Aeq,15min} Noise Levels – Daytime**

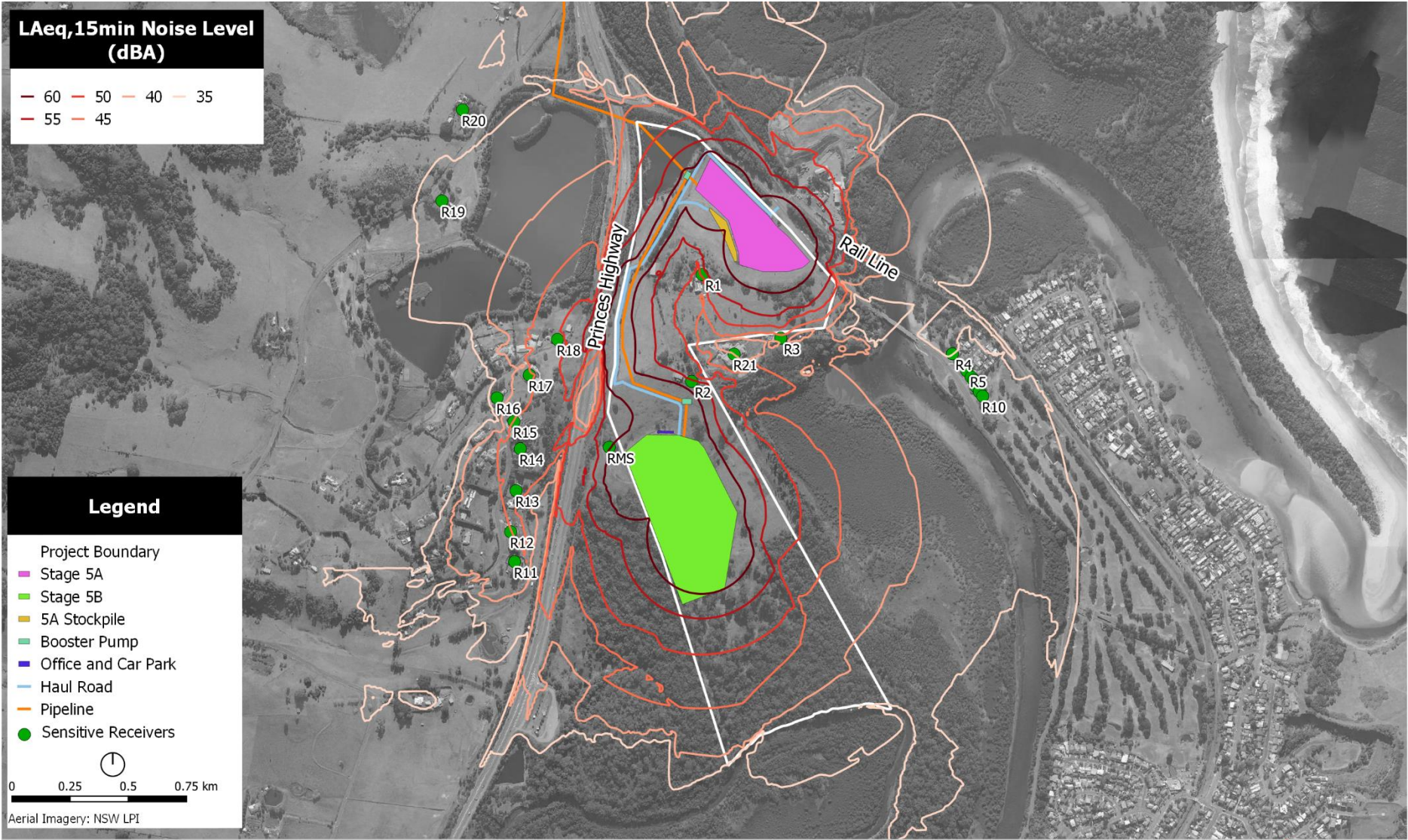


Figure A-2 LAeq,15min Noise Levels – AM Shoulder, Temperature Inversion



Figure A-3 LAeq,15min Noise Levels – AM Shoulder, Wind Enhancement

