pitt&sherry

Lilla Villa Quarry Expansion

Noise Assessment

Prepared for

Wallaroo Contracting Pty Ltd

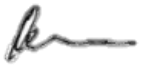
Client representative

Robert Lyne

Date

12 February 2025

Table of Contents

Prepared by — Alexander Seen		**Date — 09/12/2024**
Reviewed by — Douglas Ford		**Date — 09/12/2024**
Authorised by — Andy Turner		**Date — 09/12/2024**

Revision History

Rev No.	Description	Prepared by	Reviewed by	Authorised by	Date
0	Issued to client	A. Seen	D. Ford	A. Turner	09/12/2024
1	Minor Text Changes	D. Ford	D. Ford	A. Turner	11/12/2024
2	Minor Text Changes	D. Ford	D. Ford	A. Turner	12/02/2025

Executive Summary

This noise assessment has been prepared to support an application for the expansion of quarrying operations at Lilla Villa Quarry (ML 1910P/M) operated by Wallaroo Contracting Pty Ltd. The proposed expansion includes an increase to the permitted quarrying area and an increase in extraction limits from 40,000 cubic metres to 100,000 cubic metres per annum.

The quarry site is located approximately 4.3km west of Bicheno, accessed via Lilla Villa Lane, off the Tasman Highway.

Nearest sensitive receivers to the site are two residences, situated about 300 metres to the north and 650 metres to the east of the mining lease boundary, along with two additional residence approximately 1100 metres to the west north west.

A noise survey was conducted at the quarry on October 15th, 2024, with measurements made at several locations around the quarry site and at the two nearest residences, including close-in noise measurements of the crushing equipment operating onsite.

At the nearest residences, noise from the crushing was faintly audible, but frequently hard to discern, typically forming a component of background noise and intermittently masked by either other environmental noise (i.e. birds, insects, light breeze rustling vegetation) or noise from traffic on the Tasman Highway.

Noise modelling of the existing quarry pit and the proposed fully developed extended quarry pit, was undertaken in SoundPLAN 8.2, environmental noise modelling software. Modelling was additionally undertaken to predict noise levels from drilling and truck loading operations.

The predicted noise levels, including corrections for tonality and low frequency, meet the *Quarry Code of Practice* daytime limit of 45dB(A).

Results of recent blast monitoring meet the requirements of the *Quarry Code of Practice* for ground vibration and air-blast overpressure. These were used to inform an estimate of future blasting impact, using the AS2187.2 formulae. Using a maximum instantaneous charge mass of 147 kg, blasts to develop the proposed extents of the future quarry pit, can be practically undertaken, without exceeding the ground vibrations and air-blast overpressure limits.

Based on the assessment undertaken, noise emissions and blasting activities for the proposed quarry extension comply with the Quarry Code of Practice and project specific requirements and are unlikely to result in an unreasonable impact on the amenity, or environmental harm to nearby residences.

1. Introduction

This noise assessment has been prepared to support an application for the expansion of quarrying operations at Lilla Villa Quarry (ML 1910P/M) operated by Wallaroo Contracting Pty Ltd. The proposed expansion includes an increase to the active quarrying area and an increase in extraction limits from 40,000 cubic metres to 100,000 cubic metres.

The quarry site is located approximately 4.3km west of Bicheno, off the Tasman Highway. Wallaroo Contracting also operate a much smaller separate quarry (ML 1979P/M) approximately 2 km to the south and a concrete batching plan, about 2.5km to the south . The terrain is gently rolling with land use a mixture of forest and pasture.

The nearest sensitive receivers to the site are residences, situated between 300m to the north and 650m to east, respectively, of the mining lease boundary, along with two additional residences approximately 1100 metres to the west north west. The residence to the south east is very close to the Tasman Highway, and is significantly exposed to traffic noise. This residence and the surrounding land is owned by the quarry operator. The house is currently rented out to tenants.

The Lilla Villa quarry and traffic noise from the Tasman Highway are the only significant noise sources affecting these residences. The other quarry and the batching plant are sufficiently far away from these residences to have no impact on the cumulative noise level at these locations.

The quarry and surrounding area are shown in Figure 1, below.

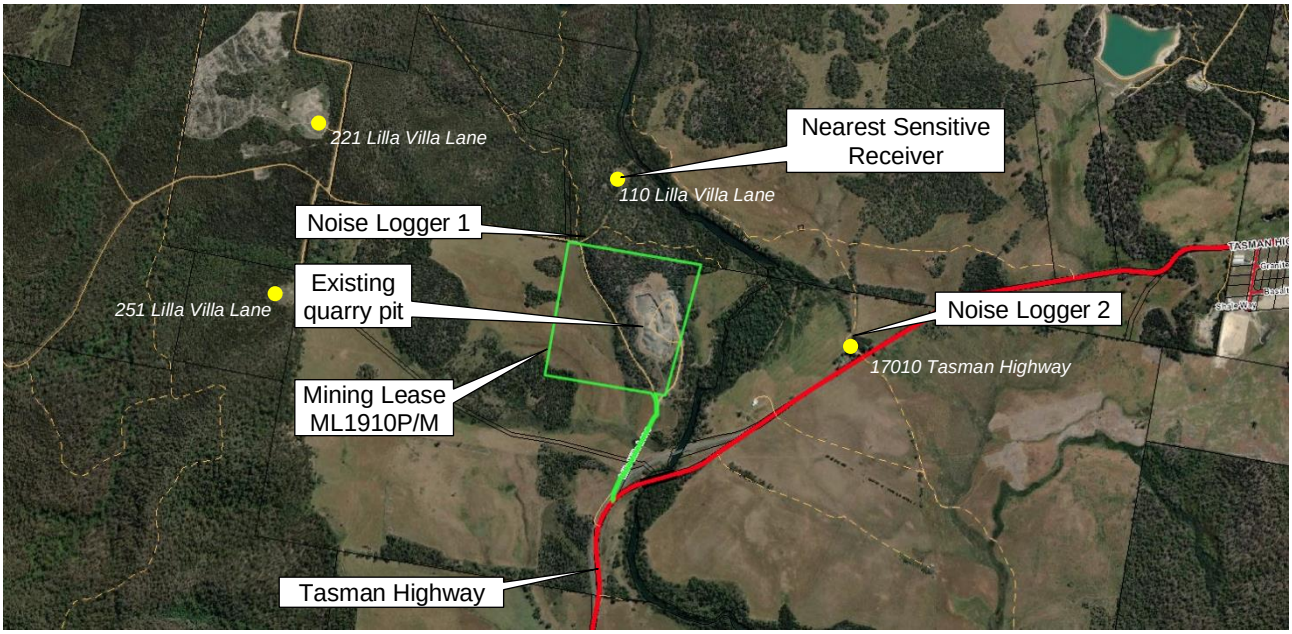


Figure 1 - Aerial Image of Lilla Villa Quarry and surrounding area. Nearest sensitive receivers shown with yellow dot.

2. Site Description

The existing quarry pit covers an area of 5.6ha, with the pit set down approximately 10 to 15 metres below the natural surface at the northern end. No permanent infrastructure is located onsite. Typically blasting is undertaken by contractors at the quarry twice per year, with drilling taking place over approximately one week, followed by crushing and stockpiling of the blasted material. Crushing is carried out by contractors (currently Fieldwicks Crushing and Screening) typically takes place over a period of several weeks.

Equipment used for the crushing campaigns typically consists of:

- 1 Mobile Jaw Crusher – Pegson 1100 x 650
- 2 Mobile Cone Crushers – Powerscreen 1300 Maxtrak
- 2 Mobile Inclined Screens – Powerscreen Chieftain 2100X Inclined Conveyor
- 1 Tracked Excavator – CAT 330F Excavator
- 1 Front End/Wheel Loader – John Deere 824L Wheel Loader

The equipment is typically laid out close to the area of the latest blast, generally in the northern part of the pit in the arrangement shown in Figure 2, with the wheel loader used to move processed material into the larger stockpiles in the southern portion of the pit and the area to the east of the pit. The exact position of the screening and crushing equipment changes slightly for each campaign. This equipment choice is reflective of current best practice, within the quarrying industry.

Figure 2 - Crushing and screening equipment layout.

Outside of the crushing, drilling and blasting campaigns, activities at the quarry include loading of stockpiled materials into trucks for transport to either the Wallaroo Contracting concrete batching plant, or to local work sites or road works. Truck movements vary with demand and do not commonly exceed 10 trucks per day, but with some extended periods of no or very low numbers of truck movements.

Crushing and drilling operations occur between 7am and 7pm weekdays, as per the Quarry Code of Practice. Loading of trucks from stockpiles occurs between 7am and 4pm on weekdays. No work is conducted on weekends or outside of daytime working hours.

The proposed expansion will see development of a further 1.8ha area to the immediate north of the existing pit, benched progressively down to match the existing pit level.

The increase in annual production rate will be achieved by increased frequency of operations within the currently permitted operating hours. No changes will be made to existing equipment or processes.

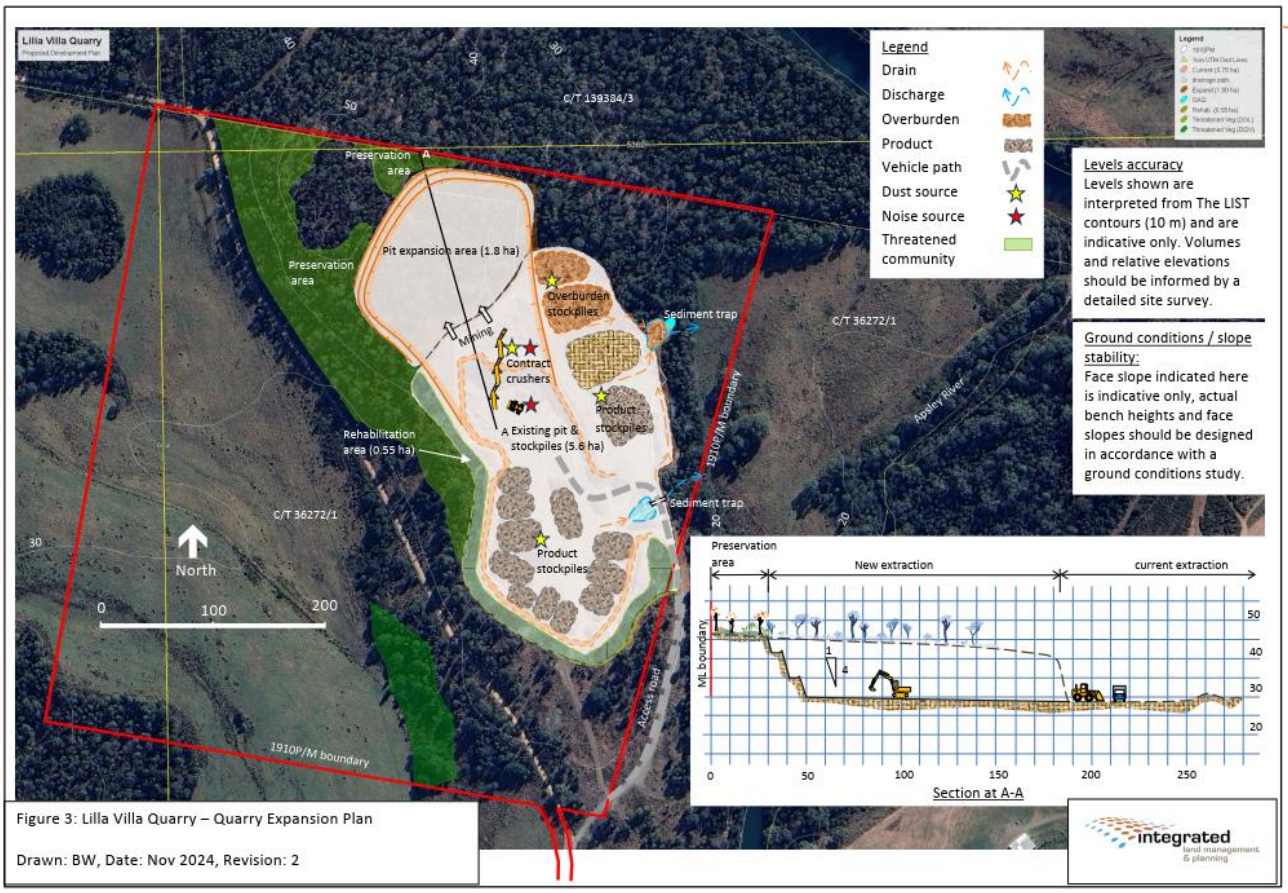


Figure 3 - Drawing of existing quarry pit and proposed expansion.

3. Noise Criteria

3.1 Project Specific Guidelines

The project specific guidelines issued by the Tasmanian EPA for the proposed quarry expansion outline a number of maters to be considered relating to noise, including that noise levels from the quarry are required to meet levels outlined within the *Tasmanian Quarry Code of Practice* and must be consistent with the *Tasmanian Environmental Protection Policy (Noise)*.

3.2 Quarry Code of Practice

The *Tasmanian Quarry Code of Practice* provides criteria for assessing noise emissions from quarrying operations at nearby sensitive receivers. Noise from quarrying and associated activities, when measured as an $L_{Aeq,10min}$, at any nearby sensitive receiver must not exceed the greater of:

- The $L_{A90,10min}$ plus 5 dB(A) excluding noise from the quarry,
- 45 dB(A) during the daytime (0700 to 1900),
- 40 dB(A) during the evening (1900 to 2200),
- 35 dB(A) over night (2200 to 0700).

No quarrying operations (crushing, drilling and loading of trucks) will be carried out, outside of daytime hours, so no assessment of evening or night-time noise levels is required. As such the 45dB(A) limit is adopted for the assessment.

3.3 Environmental Protection Policy

The Tasmanian Environmental Protection Policy (Noise) 2009 (EPP) has general provisions for the regulation of proposed commercial / industrial noise sources with the objective of protecting environmental values. In summary, it requires:

- Best practice environmental management to be employed to reduce noise emissions, to the greatest extent that is reasonably practical,
- Dominant or intrusive noise characteristics of noise emissions to be reduced to the greatest extent that is reasonably practical.
- That a "reserve capacity" in the acoustic environment is retained at any location, such that the combined noise from a number of activities does not prejudice the protection of environmental values at that location.

The EPP also provides acoustic indicator levels for various noise sensitive activities, based on World Health Organisation research. These indicators relate to the total ambient noise levels at a sensitive receiver – not just the noise from the industrial source being assessed. Indicators relevant to this noise assessment include:

- Outdoor Living Areas (Serious annoyance, daytime and evening) 55 dB(A) $L_{eq,16hours}$
- Outdoor Living Areas (Moderate annoyance, daytime and evening) 50 dB(A) $L_{eq,16hours}$

L_{eq} is the "equivalent continuous noise level" which can be thought of as the average noise level over a specific period of time[1]. L_{max} is the maximum noise level recorded in a specific period of time.

4. Noise Sources

4.1 Existing Noise Environment

To characterise the existing noise environment unattended noise logging was undertaken at the two nearest sensitive receivers to the quarry between 15th and 28th of October 2024, as shown in Figure 1. During this period crushing was occurring in the quarry.

Unfortunately, the noise logger at position 2 (along the Tasman Highway) was damaged by cows grazing within the same paddock as the noise logger and data recorded from October 17th onwards was deemed unusable. Due to wind conditions on the 16th this left approximately 24 hours of usable data at this location. Approximately nine days of usable data

The noise monitoring was undertaken using a Rion NL-42 and a Ngara noise logger, both noise loggers were setup and operated in accordance with the *Tasmanian DEPHA Noise Measurements Procedures Manual*, 2008.

Weather during the monitoring period was generally fine. The nearest available weather data from the Bureau of Meteorology weather station at Friendly Beaches, approximately 12km south of the site recorded moderate winds speeds, less than 20 km/h, throughout the period with several periods of higher average wind speeds up to 35km/h and gusts up to 55km/h. Due to the distance from the coast line, elevation differences and the topography of the area, the quarry and surrounding area is likely to be afforded some additional shielding from the wind, so this is regarded as a conservative estimate of wind speeds at the logging sites. One period of rainfall was recorded during October 18th, totalling to 21mm. The 30 minute rainfall totals did not exceed 3 mm and did not cause a noticeable impact on the noise levels recorded. Approximately nine days of usable data was obtained from the noise logger at 110 Lilla Villa Lane, after excluding weather affected periods.

Aggregated results from the noise monitoring are shown in Table 1, below and measured noise levels are displayed in Figure 4, with periods of high wind excluded. The minimum recorded 10 minute background noise level and the aggregate background noise levels for each period, is indicated.

[1] Noise levels measured in decibels are averaged logarithmically.

Table 1 - Aggregated noise logging results at nearest sensitive receivers.

Location	Location 1: 110 Lilla Villa Lane				Location 2: 17010 Tasman Highway			
Time Period	Ambient $L_{eq,\ 10min}$ – dB(A)	Background L_{90} – dB(A) *Min*	*Period*	Maximum $L_{max,\ fast}$ – dB(A)	Ambient $L_{eq,\ 10min}$ – dB(A)	Background L_{90} – dB(A) *Min*	*Period*	Maximum $L_{max,\ fast}$ – dB(A)
Day (7am – 7pm)	46.8	21.1	40.6	82.7	53.9	35.6	47.8	82.1
Evening (7pm – 10pm)	43.9	20.4	38.8	77.7	49.8	31.7	43.5	77.0
Night (10pm – 7am)	43.5	20.1	39.5	76.2	50.8	35.5	41.9	68.2

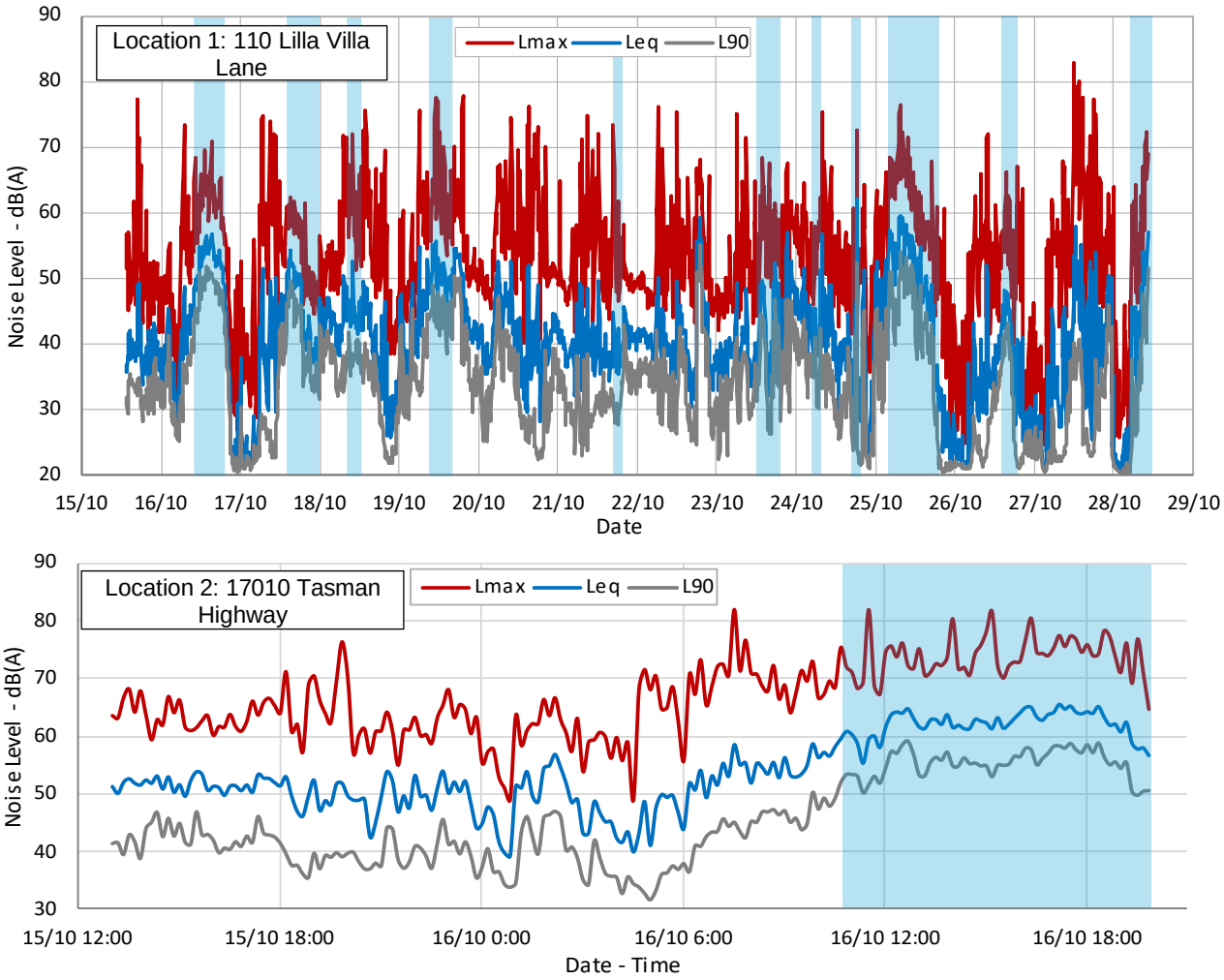


Figure 4 – Noise Logging Results. Periods of inclement weather shaded blue.

4.2 Noise Measurements

To help characterise the noise from the existing quarry, on-site noise measurement were conducted on October 15th, 2024, during crushing operations. Noise measurements were taken at a number of locations within the pit, in close proximity to the crushing equipment, around the edge of the pit, as well as at the two nearest residential receivers.

Noise measurements were made using a Rion NL-42 with a Ngara noise logger, setup adjacent to the eastern pit wall to provide verification of the noise levels from the quarry during off-site measurements. Measurements within the pit were taken over approximately 5 minutes (As crushing noise was dominant and very consistent) with all other measurements taken over 10 minutes or more. Measurement locations are shown in Figure 5, with the recorded noise levels given in Table 2 and plotted in Figure 6.

Onsite noise was dominated by noise from the crushing equipment, made up of a low frequency rumble from diesel engines and mid frequency “chugging” sounds of rock being processed by the Jaw crusher, which is the dominant noise source on site. At the nearest residences, noise from the crushing was faintly audible but generally hard to discern, typically forming a component of the background noise, substantially masked by either environmental noise (i.e. birds, insects, light breeze rustling vegetation), at 110 Lilla Villa Lane, or noise from traffic along the Tasman Highway at 17010 Tasman Highway. The measurements at these residences contained sufficient low frequency to trigger the 5 dB(A) correction, but only very low levels of tonality, requiring corrections of between 0 and 0.2 dB(A).

Figure 5 - Locations of noise measurement positions. Left: Overall view, Right: Close up view of pit, including equipment locations.

Table 2 - Noise Measurement Results – Uncorrected Noise levels.

#	Description	L_{eq} dB(A)	L_{90} dB(A)	L_{max} dB(A)	Tonality Correction dB(A)	Low Frequency Correction dB(A)
M01	Onsite Control Point	68.5	67.0	85.4	-	-
M02	In pit measurements of equipment	85.5	82.2	98.9	0.1	-
M03		81.9	79.6	91.8	0.1	-
M04		84.9	82.5	95.1	0.2	-
M05		82.5	82.1	84.4	0.1	-
M06		83.0	82.6	84.5	0.7	-
M07		84.0	83.0	88.0	0.3	-
M08		78.5	75.0	90.9	0.1	-
M09	Pit Entry	57.8	51.3	78.2	4.2	-
M10	Northern Pit Face	57.3	53.2	71.5	3.1	5
M11	110 Lilla Villa Lane	39.3*	32.1	69.1	-	5
M12	17010 Tasman Highway	48.9 (42.4)**	40.7	67.9	0.2	5

Notes: * The M11 measurement was affected by quite loud, near continuous, local bird noise, which could not be excluded from the recording. This level of bird activity is not surprising as the house site is completely surrounded by bush. Crusher noise could only be very faintly discerned from time to time. This measurement is not representative of the level of noise from the quarry.

** The M12 measurement was significantly affected by noise peaks from multiple vehicles passing close by on the highway. A corrected L_{eq} is indicated in brackets, after these noise peaks were removed.

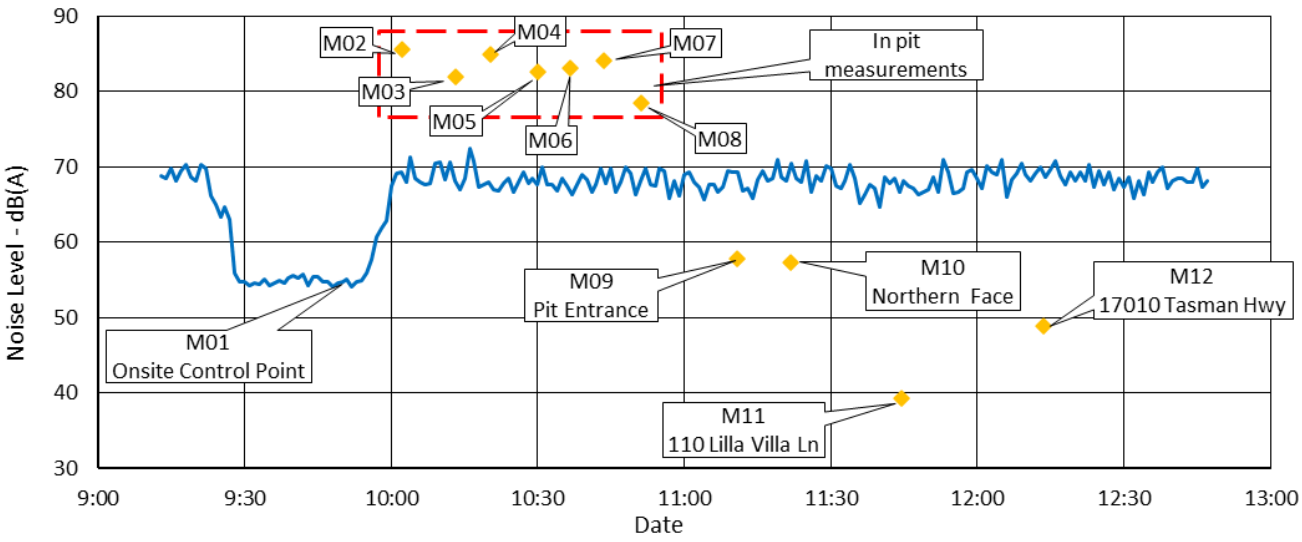


Figure 6 - Plot of measured noise levels during noise survey.

4.3 Site Noise Sources

Due to the close positioning and interworking nature of the crushing and screening equipment onsite, independent noise measurements could not be made of each item of equipment. Reference sound power levels and spectra were used and then the results of the model checked against on-site measurements.

Reference sound power levels for the jaw crusher, inclined screens and excavator were obtained from previous measurements undertaken by pitt&sherry of similar equipment, operating in other Tasmanian quarries.

The sound power level and spectrum, for the cone crusher was established from a measurements made onsite, that was able to be positioned, to include a minimum amount of interference from the other plant.

A typical level from the SoundPLAN noise reference library for a 140kW wheel loader was used to establish the line source for loader movements onsite.

Equipment sound power levels used in the modelling are given in Table 3.

Table 3 - Quarry Noise Sources

#	Equipment	Qty	Nom. Height – m	Sound Power Level – dB(A)
S01	Pegson 1100 x 650 Jaw Crusher	1	2	119.8
S02	Powerscreen Chieftain 2100X Inclined Conveyor	2	1.6	109.1
S03	Powerscreen 1300 Maxtrak Cone Crusher	2	2	109.6
S04	Drill Rig	1	0.5	117.0
S05	Excavator	2	3	107.7
S06	Wheel Loader (stationary)	1	2	106.1
S07	Wheel Loader (moving)	1	2	70.0 dB(A)/m
S08	Road Truck	1	1.6	65.0 dB(A)/m

5. Noise Assessment

5.1 Methodology and Assumptions

Noise modelling was carried out in accordance with the Tasmanian DEPHA *Noise Measurement Procedures Manual*, 2008. Noise level calculations were implemented using *SoundPLAN 8.2* environmental noise modelling software. Modelling assumptions and settings include:

- The ISO 9613-2 noise calculation standard was used within SoundPLAN. This standard assumes “worst case” noise propagation conditions, consisting of a moderate atmospheric inversion with a light wind blowing from the source to the receivers. These conditions typically occur at night and in the early morning and rarely during the daytime. This provides a conservative estimate of noise propagation levels for a quarry that only operates during the daytime.
- Existing buildings, roads and other permanent structures and features were included within the model. All building footprints were sourced from *theList.*
- Existing terrain topography was obtained from 2 metre LIDAR data sourced from the ELVIS online elevation database from approximately 2020. The ground model was modified to match the existing quarry site topography including the existing pit layout and proposed pit extension, based on on-site observations and project drawings.
- A ground absorption factor of G=0.8 (i.e. 80% hard/20% soft) was used across the quarry site, with a factor of G=0.6 (60% hard / 40% soft) soft throughout the remainder of the model.

Four scenarios were modelled:

- Crushing operations in the existing quarry pit,
- Crushing operations in the proposed new (fully developed) pit,
- A drill rig (S04) drilling blast holes, using the ground model for the existing pit, and
- Loading of trucks (S08) by a wheel loader (S06) from the stockpiles. It was assumed that over a 10-minute period a truck would access the site, be loaded and depart the site.

Both crushing scenarios contained noise sources for one jaw crusher (S01), two cone crushers (S02) and screens (S03), along with one excavator (S05) and a wheel loader driving around the pit and the stockpiles (S06) as per the typical setup of equipment during crushing campaigns.

The layout of the SoundPLAN noise models is shown in Figure 7 and Figure 8, below.

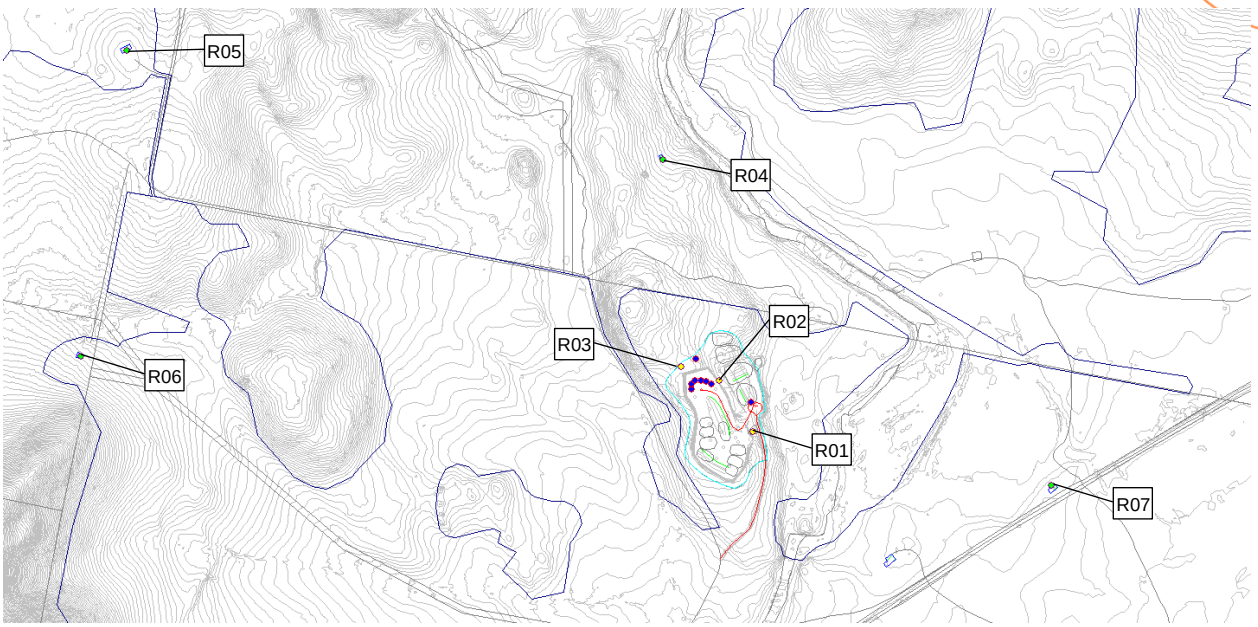


Figure 7 – Overview of SoundPLAN noise model layout.

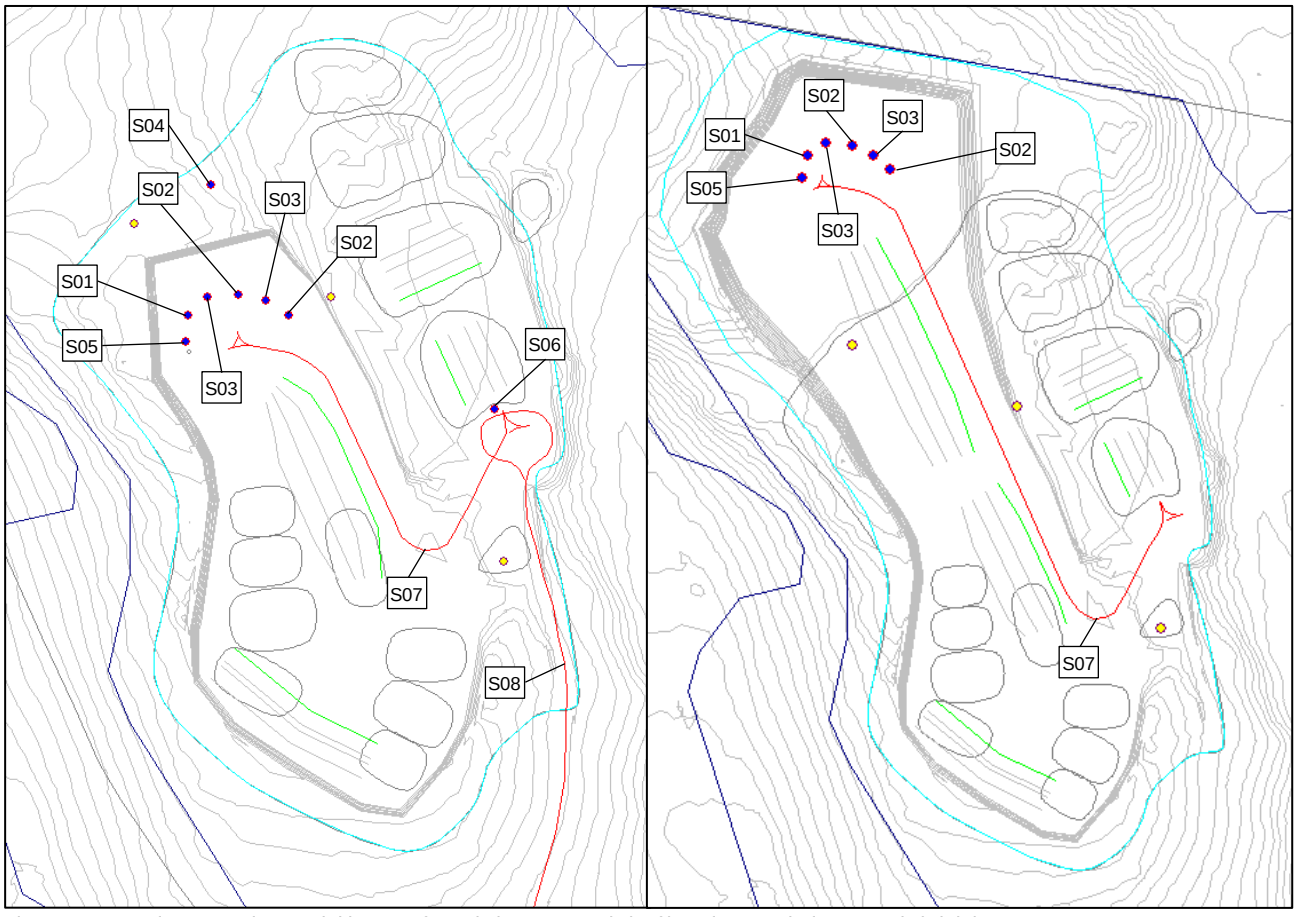


Figure 8 - SoundPLAN Noise model layouts for existing quarry pit (Left) and expanded quarry pit (Right).

Noise Model Validation

The noise levels from the noise sources were verified in the SoundPLAN noise model against measurements taken on the floor of the pit, the edges of the pit and at one (M12) of the nearest sensitive receivers. As noted above the measurement at the other nearby residence (M11) did not accurately represent the quarry noise due to interference from birds. The comparison is shown in Table 4.

The modelling results for receivers on the quarry floor are nearly all within +/-2dB(A) of the measured levels, with one modelled location (M8), about 4 dB(A) lower than the measured level. The model results on the periphery of the pit (M1, M9, M10) are higher than measured values at these locations by 0.6 to 6.8 dB(A). The level predicted by the model at the house at 17010 Tasman Highway, is 0.1 dB(A) larger than the level measured.

The variations between modelled and measured results can largely be attributed to the limitations in accuracy and detail of the representation of the ground geometry, in the model as well as fluctuations in the noise output from the crushing plant. Generally the model results are higher than the measured results for locations on or beyond, the periphery of the quarry pit, indicating that the modelling results can be considered to be slightly conservative.

Table 4 – Comparison of Raw Measured and Modelled Noise Levels for Existing Crushing Operations

#	Description	Measured L_{eq} dB(A)	Modelled L_{eq} dB(A)	Variance dB(A)
M01	Onsite Control Point	68.5	69.1	+0.6
M02	In pit measurements near crushing equipment	85.5	84.9	-0.6
M03		81.9	81.1	-0.8
M04		84.9	84.1	-0.8
M05		82.5	82.0	-0.5
M06		83.0	84.5	+1.5
M07		84.0	84.1	+0.1
M08		78.5	74.4	-4.1
M09	Pit Entry	57.8	63.9	+6.1
M10	Northern Pit Face	57.3	64.1	+6.8
M12	17010 Tasman Highway	42.4	42.5	+0.1

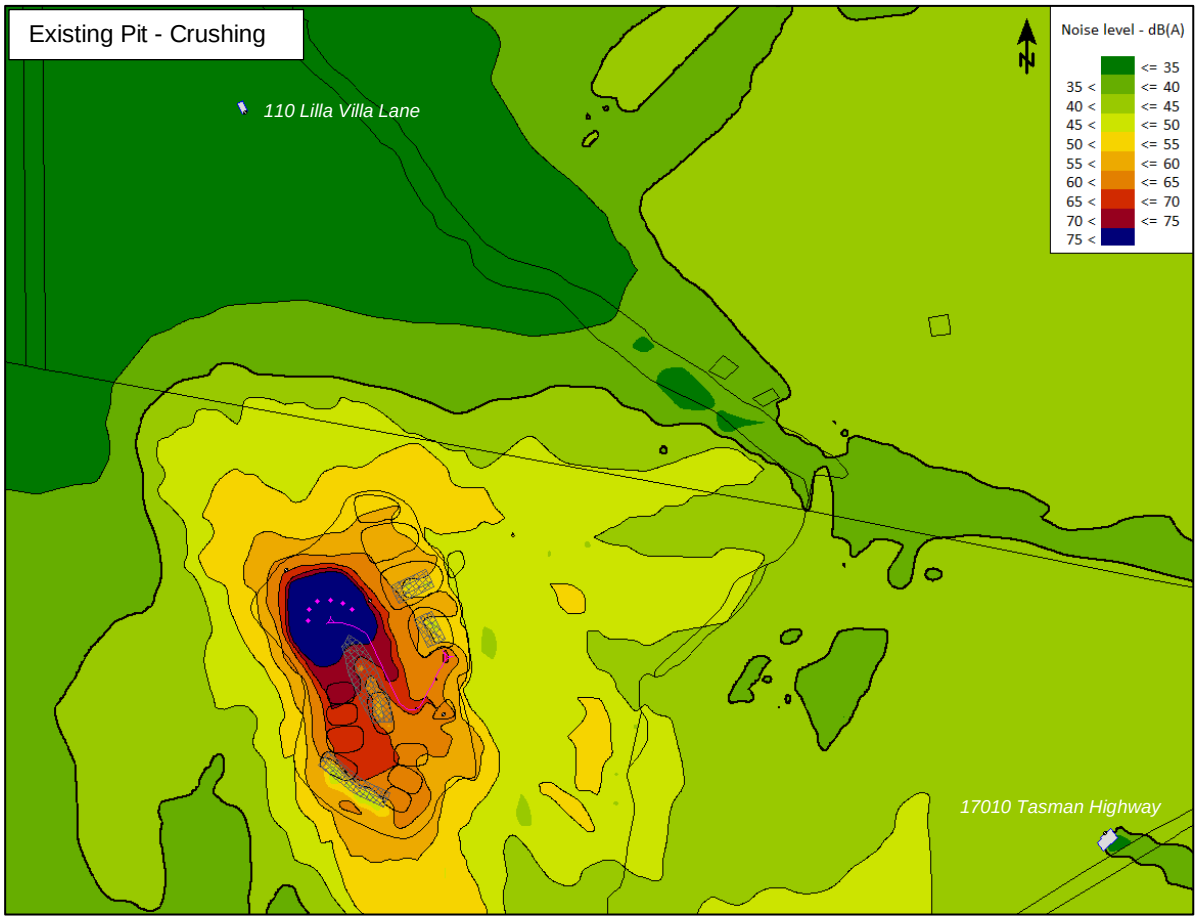
5.2 Predicted Noise Levels

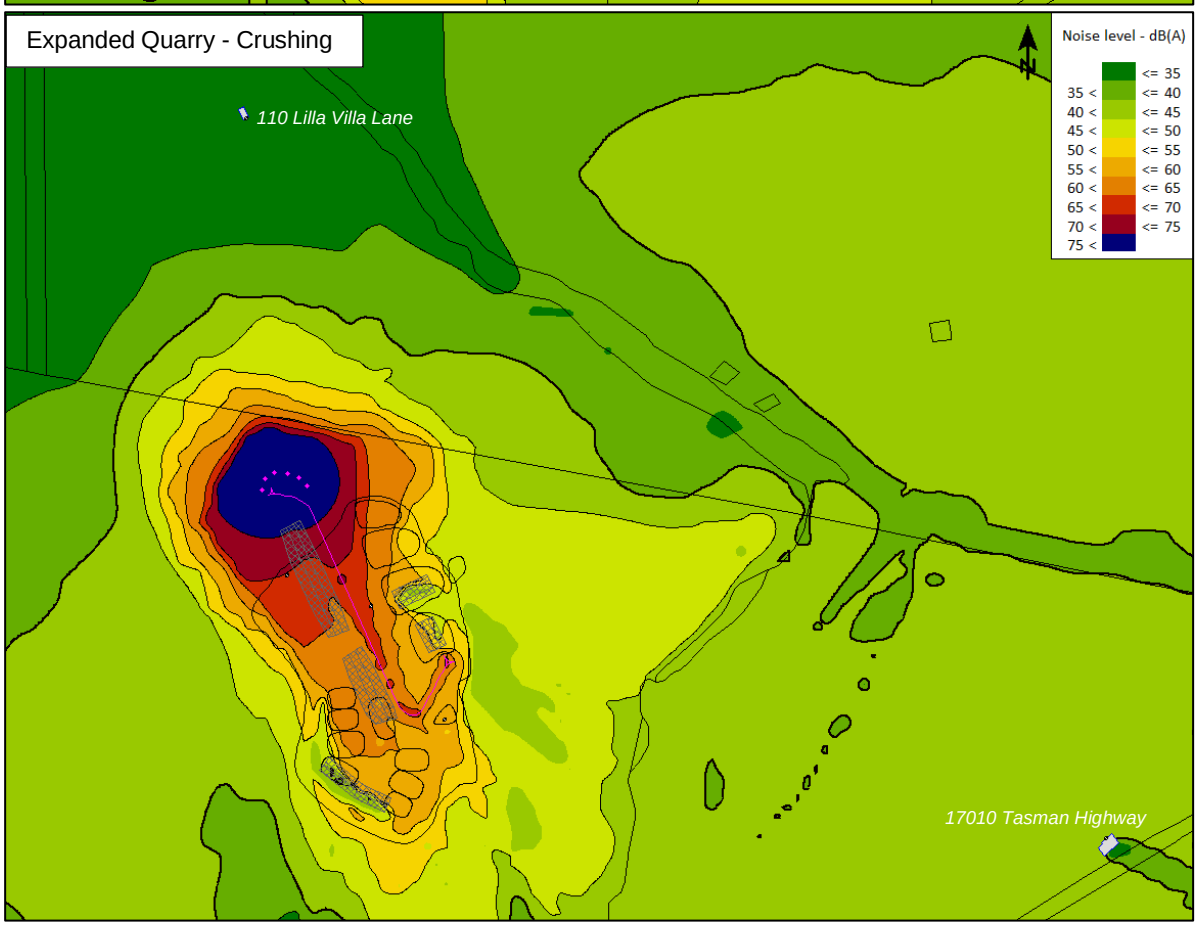
Noise levels predicted by the SoundPLAN modelling for the four scenarios are given in Table 5, below. The predicted noise levels include corrections between 0 and 4 dB(A) for tonality. A +5 dB(A) correction was applied at 110, 221 and 251 Lilla Villa Lane to account for the presence of low frequency noise. This arises as a result of higher frequency noise being preferentially attenuated to low frequency noise over the intervening distance, thus increasing the remaining proportion of low frequency noise.

Table 5 - Predicted noise levels. Including corrections for tonality and low frequency.

#	Receiver	Crushing in Existing Pit	Crushing in Expanded Pit	Drilling	Truck Loading
	Quarry Code Limit	45.0			
R01	Pit Entrance	64.8	58.4	51.5	56.9
R02	Northern Pit Face	67.0	-	67.6	48.8
R03	Onsite Control Point	70.8	-	60.2	54.4
R04	110 Lilla Villa Lane	36.8	40.0	36.6	27.2
R05	221 Lilla Villa Lane	35.2	37.2	30.9	28.0
R06	251 Lilla Villa Lane	34.3	34.0	32.8	26.4
R07	17010 Tasman Highway	45.0	44.4	36.7	39.1

Results for some R2 and R3, are not provided for the fully developed pit scenarios, as these locations will have been "excavated away". Noise grid maps for the four scenarios are shown in Figure 9, below. These grid maps do not include corrections for tonality and low frequency. Due to the contour plotting process slight differences may occur between the values given in Table 5 and those identified on the noise grid maps, in this case values from Table 5 should be given precedence.


Existing Pit - Crushing
110 Lilla Villa Lane
17010 Tasman Highway
Noise level - dB(A)
<= 35
35 < <= 40
40 < <= 45
45 < <= 50
50 < <= 55
55 < <= 60
60 < <= 65
65 < <= 70
70 < <= 75
75 <


Expanded Quarry - Crushing
110 Lilla Villa Lane
17010 Tasman Highway
Noise level - dB(A)
<= 35
35 < <= 40
40 < <= 45
45 < <= 50
50 < <= 55
55 < <= 60
60 < <= 65
65 < <= 70
70 < <= 75
75 <

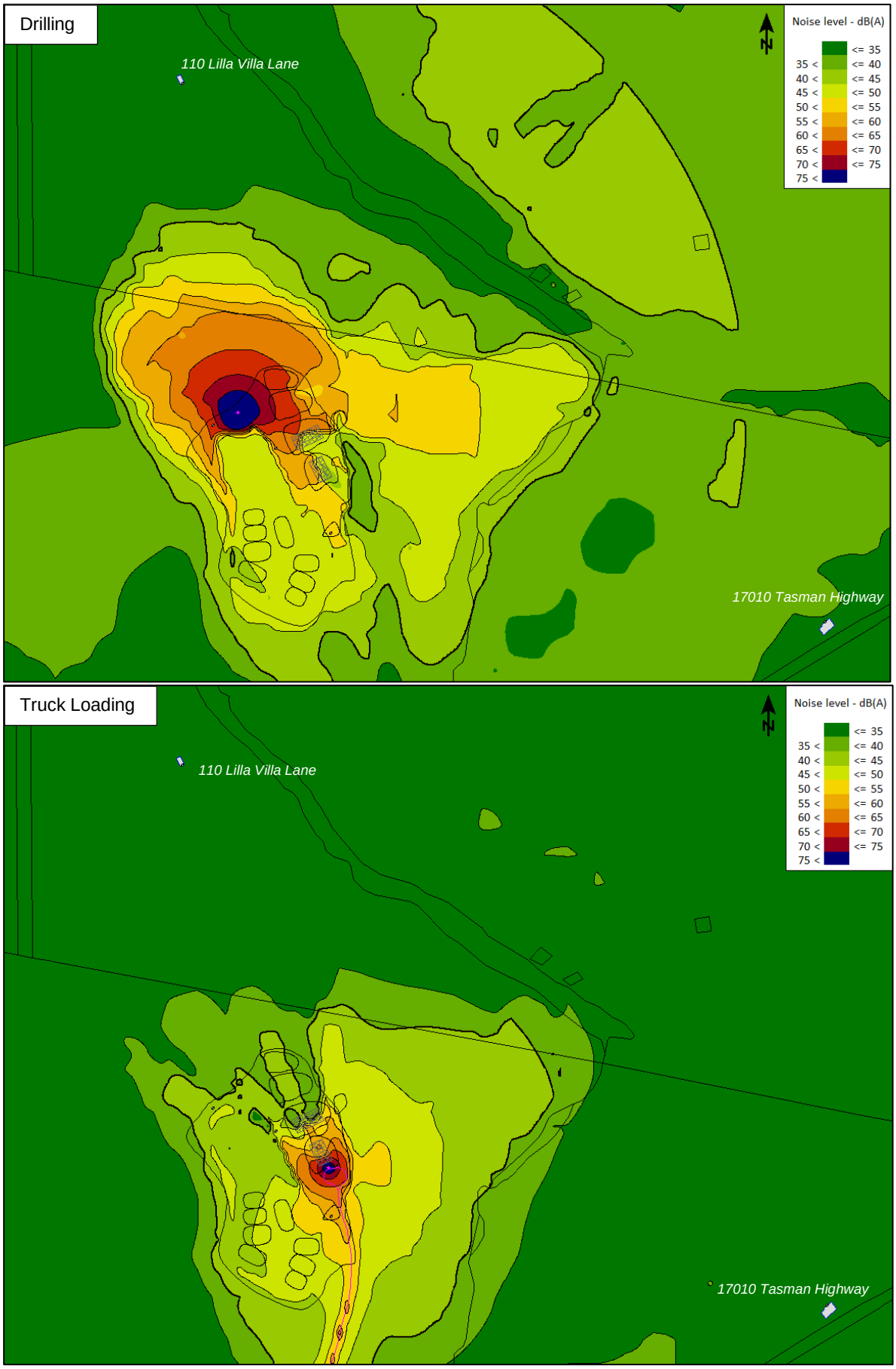


Figure 9 - SoundPLAN Noise Grid Maps, at 1.2m above ground height and 10m grid spacing.

5.3 Traffic Noise

The modelling of noise emissions from the site described above, includes trucks being loaded with material at the quarry and travelling along the quarry access road to Lilla Villa Lane. As noted, the predicted noise levels, meet the quarry code limits, at all nearby residences.

Tasmanian Department of State Growth traffic count data for 2023 indicates that the Tasman Highway carries an AADT of 1,628 vehicles, of which 14.9% are heavy vehicles. The proposed addition of up to ten to twenty truck movements per day from the quarry (all during daylight hours) is a negligible change, which will make no discernible difference to the level of traffic noise in the vicinity of the highway.

6. Blasting

Blasting at the quarry takes place approximately twice per year, depending on demand and is typically undertaken by specialist subcontractors (currently Orica). Blasts are designed to generate the required fragmentation, while meeting the requirements of the Tasmanian *Quarry Code of Practice* (2017) which includes the following limitations on air-blast overpressure and ground vibration at nearby sensitive receivers:

- For 95% of blasts, air-blast overpressure must not exceed 115 dB (L_{in} Peak);
- Air-blast overpressure must not exceed 120 dB (L_{in} Peak) at all;
- for 95% of blasts, ground vibration must not exceed 5 mm/s peak particle velocity; and
- ground vibration must not exceed 10 mm/s peak particle velocity at all. (A long term regulatory ground vibration goal of 2mm/s is additionally recommended within the code of practice.)

As the quarry pit is further developed, the distance between blasts and the nearest residence to the north, will decrease from about 550m currently, down to about 300m. This will potentially require adjustments to the blast designs utilised, in order to ensure that these limits are not exceeded.

To demonstrate the ability of future blasts to achieve the Quarry Code limits, air-blast over pressure and ground vibration level, have been estimated using the methods in Appendix J of AS2187.2 (2006).

The values of K_g (420.5) and K_a (1.91) used in the calculations have been informed by a blast report for a blast conducted on the 20th September 2024, were a peak particle velocity of 2.22mm/s and blast overpressure of 102.4 dB(Linear) were recorded for a charge mass of 260 kg at a monitoring distance of 700 metres.

6.1 Ground Vibration

Ground vibration is estimated using the equation.

$$PPV = K_g \left(\frac{\sqrt{Q}}{R} \right)^B$$

where: Q is the maximum instantaneous charge mass, kg
K_g =525.9, B = 1.45 (constants relating to site geology)
R = 300m (distance of blast to the nearest receiver – 110 Lilla Villa Lane)
PPV is the estimated ground vibration peak particle velocity in mm/s.

To achieve the 95% target of 5 mm/s a maximum instantaneous charge mass of upto 147 kg can be used, for the blast, closest to 110 Lilla Villa Lane.

6.2 Air-Blast Overpressure

Air blast overpressure is estimated using the equation.

$$P = K_a \left(\frac{\sqrt[3]{Q}}{R} \right)^a , \quad dBL = 20 * Log_{10} \left(\frac{P}{20 * 10^{-9}} \right)$$

Where: *Q* is the maximum instantaneous charge mass, kg
a = 1.45 (a constant relating to site geology)
K_a = 2.39 (a constant relating to the degree of confinement of the charge in the drill hole)
R = 300m (distance of blast to the nearest receiver – 110 Lilla Villa Lane)
P is the estimated air-blast overpressure in Pa
dB(L) is the estimated air-blast overpressure in dB(L_{in}, peak)

Using the maximum instantaneous charge masses of 147kg used to meet the peak particle velocity 95% target, the predicted air blast overpressure is 110.7 dB(L_{in}, peak) at 110 Lilla Villa Lane. This level is well below the 95% target of 115 dB(L_{in}, peak).

This demonstrates that it is practical to design blasts for the proposed extended pit, that will meet the limits of the quarry code.

7. Mitigation Measures

As the noise levels are calculated to be below the noise levels required by the *Quarry Code of Practice*, no specific noise mitigation measures are required. The following "good practice" noise mitigation measures will be adopted to ensure that noise emissions from the transfer station meet the calculated levels.

- All mobile plant and equipment should be maintained in good order at all times, especially noise control devices such as exhaust mufflers.
- An on-site speed limit of 20km/h or similar should be observed to minimise vehicle noise.
- All site based vehicles should be fitted with reversing alarms that use broad band style reversing beacons.
- Dropping of loads and scraping of buckets on the ground should be avoided.
- Ground vibrations and blast overpressure should continue to be monitored at the nearest sensitive receiver during blasts; and
- Blasting should be undertaken in a manner to ensure that blasts are adequately designed to prevent excessive blast overpressure or ground vibrations and adjusted accordingly based on results of blast monitoring results.

8. Conclusions

Based on the noise measurements and modelling undertaken, noise levels from crushing, drilling and truck loading activities at the Lilla Villa quarry currently meet the Quarry Code of Practice noise requirements and are predicted to continue to meet the requirements as the quarry is developed. Noise from crushing operations is predicted to reduce slightly, as the face advances, providing a greater degree of shielding.

Heavy vehicle movements from the quarry are significantly less than existing traffic levels on the Tasman Highway and the small increase in truck movements associated with the expansions, is not expected to cause a discernible change in traffic noise.

Existing blasts meet the Quarry Code of Practice requirements for ground vibration and blast overpressure. It will be practical to design all future blasts, required to develop the proposed new pit, to continue to meet these limits.

Based on the assessment undertaken, noise emissions and blasting activities for the proposed quarry extension currently comply with the Quarry Code of Practice and will continue to do so, under the proposed expansion. Noise emissions are unlikely to cause an adverse impact on amenity or environmental harm at any nearby sensitive receivers.

pitt&sherry

Lilla Villa Quarry Expansion
Noise Assessment

Pitt & Sherry
(Operations) Pty Ltd
ABN 67 140 184 309

Phone 1300 748 874
info@pittsh.com.au
pittsh.com.au

Located nationally —
Melbourne
Sydney
Brisbane
Hobart
Launceston
Newcastle
Devonport