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Acoustic Report – Proposed Expansion of Extraction Area

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MEMBER FIRM OF THE ASSOCIATION OF AUSTRALASIAN ACOUSTICAL CONSULTANTS

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1. Introduction

The client currently operates a hard rock quarry at the site described as 130 McMahons Road, Launching Place.

The subject site operates under Planning Permit **YR-2010/58/A** which includes an approved extraction area. As part of ongoing operations at the site, the client intends to expand the currently approved extraction area to the north and northwest.

The proposal has the potential to result in increased noise emissions from the site operations at sensitive residential receptors in proximity to the site.

In consideration of the above, Watson Moss Growcott Acoustics (WMG) has been engaged to review the proposal and consider potential noise emissions associated with the existing and proposed operations at the residential receptors in proximity to the subject site.

This report presents the findings of the assessment and includes indicative noise mitigation strategies where relevant.

2. Noise Assessment Terminology

Noise assessment terminology used within this report is defined within Table 1 below.

Table 1: Noise Assessment Terminology

Terminology	Definition
dB(A)	Decibels recorded on a sound level meter, which has had its frequency response modified electronically to an international standard, to quantify the average human loudness response to sounds of different character
L_{eq}	The equivalent continuous level that would have the same total acoustic energy over the measurement period as the actual varying noise level under consideration. It is the noise measure defined by the EPA as the measure of the noise to use in assessing compliance with noise limits.
L_{90}	The level exceeded for 90% of the measurement period, which is representative of the typical lower levels in a varying noise environment. It is the noise measure defined by the EPA as the measure of the background noise level to use in determining noise limits.
Sound Power Level (Lw)	The sound power level of a source is a measure of the amount of energy in the form of sound emitted from the source. The sound power level of a source is an inherent characteristic of that source and does not vary with distance from the source or with a different acoustic environment. The sound power level equals the sound pressure level at a distance from the source plus 10 times the logarithm (to base 10) of the measurement surface area (m^2), and is relative to a reference sound power of 1pW, (10-12 Watts).
Sound Pressure Level (Lp)	Sound that we can hear with our ears or measure with a sound level meter is actually small variations in the pressure of the air around us. The magnitude of the pressure fluctuations vary over a very wide range from the very lowest levels we can just hear to the very high levels we need to be protected from, and for that reason sound is measured on a logarithmic scale. The sound pressure level equals 10 times the logarithm (to base 10) of the sound pressure divided by a reference pressure, which is 20 µPa. The sound pressure level reduces with increasing distance from a source and is influenced by the surroundings.

4. Measurement Equipment

As part of the assessment works, WMG has used the equipment described in Table 2 below.

Table 2: Measurement Equipment List

Equipment Designation	Use of Equipment
Rion NA27 Precision Sound Level Meter	Handheld Noise Measurements
Ngara Real Time Sound Acquisition System	Fixed Position Unattended Noise Monitoring

The field calibration of the equipment was checked with a Bruel & Kjaer Type 4230 Sound Level Calibrator at the commencement and completion of the noise measurements and found to be within the correct calibration range.

5. Site and Surrounding Environment

The subject site is located at 130 McMahons Road, Launching Place, and abuts Rural Conservation Zone (RCZ) land to the west, south and north and Public Use Zone (PUZ) land to the east.

Based on their proximity to the site, the closest, and in this instance most relevant receptors will include the following:

- **R01** – 165 McMahons Road.
- **R02** – 155 McMahons Road.
- **R03** – 145 McMahons Road.
- **R04** – 115 McMahons Road.
- **R05** – 70 Ure Creek Road.
- **R06** – 60 Ure Creek Road.
- **R07** – 50 Ure Creek Road.
- **R08** – 40 Ure Creek Road.
- **R09** – 10 Parrot Road.
- **R10** – 35 Parrot Road.
- **R11** – 23 Westridge Road.
- **R12** – 19 Westridge Road.
- **R13** – 9 Westridge Road.
- **R14** – 109 Moora Road.

It is understood that there are other receptors located immediately to the north of the crushing area, however these are owned by the quarry, and hence have not been considered as noise sensitive within the assessment. The critical receptors, the approved extraction area and the proposed expansion area for the site are identified in Figure 1.

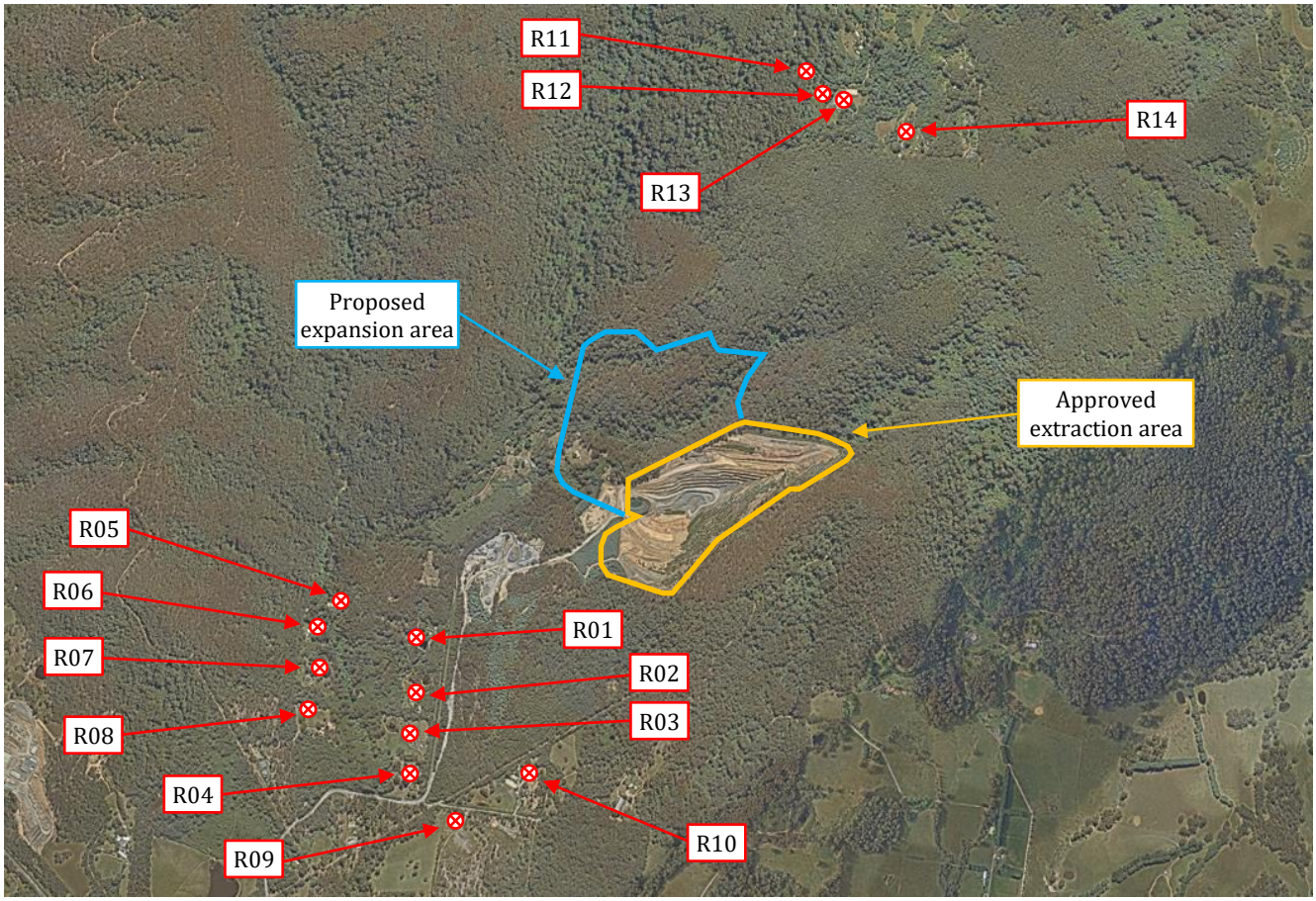


Figure 1: Aerial image identifying subject site boundaries and critical receptors

6. Planning Permit Requirements and Noise Assessment Criteria

The subject site currently operates under Planning Permit YR-2010/58 which was issued 9th September 2010. The Permit includes Conditions 24 and 26 which relate to assessing and controlling noise emissions from the subject site, and references reporting previously prepared by WMG.

These conditions are included below.

24. *Noise generated by the extractive industry and other permitted operations, including the movement of vehicles along the internal access road, must comply with the Environmental Protection Authority's "Interim Guidelines for the Control of Noise from industry in Country Victoria" (N3/89) and State Environment Protection Policy (Control of Noise from Commerce Industry and Trade) No. N-1 (SEPP N-1) to the satisfaction of the Responsible Authority.*
26. *Noise levels for the whole of the site including all ancillary activities conducted onsite must be managed in accordance with the recommendations contained in the report by Watson Moss Growcott Acoustics Pty Ltd.*

The Permit was issued during 2010, and hence does not consider the current legislation and associated framework which governs noise emissions from commercial and industrial premises within Victoria.

Both N3/89 and SEPP N-1, although providing the basis for the Planning Permit, have since been superseded by the Environment Protection Act 2017 (The Act) which came into effect July 1, 2021. In consideration of the above, and for the purposes of this assessment, it would be envisaged that any noise emissions due to the current and proposed site operations will need to comply with the requirements of The Act.

The approach within The Act focuses on prevention of pollution impacts rather than managing the impacts after they have occurred and is based on a person or entities General Environmental Duty (GED) for the protection of human health and the environment from pollution and waste.

The GED is explained within Part 3.2 of The Act and stipulates that 'a person who is engaging in an activity that may give rise to risks of harm to human health or the environment from pollution or waste must minimise those risks, so far as reasonably practicable'.

Determining what is deemed to be 'reasonably practicable' is explained within EPA Publication 1856 and relates to the implementation of controls that are proportionate to the potential risk. It relates to the potential for harm to occur, the potential impacts on the environment, and considers what controls are available to reduce the risk, and their associated costs. It is deemed the responsibility of the operator to understand and assess the risks which their operations may pose on human health or the environment, and once understood, implement proportionate controls to mitigate or minimise the risk of harm.

The definition of harm within The Act introduces the concept of what is deemed 'unreasonable' generally, and in particular 'unreasonable noise'. The Environment Protection Regulations 2021 (The Regulations) under the Act essentially define unreasonable noise as noise that exceeds the noise limit that applies under the Noise Protocol (EPA Publication 1826.4) at the time the noise is emitted.

Methodologies, specific criteria, and guidance regarding unreasonable noise emissions are included in the following Regulations and guideline documentation referred to within The Act and provided by the EPA:

- The Regulations.
- Noise Protocol.
- Environmental Reference Standard (ERS).
- EPA Publication 1996 Noise Guideline – assessing low frequency noise.
- EPA Publication 1856 Reasonably practicable.

With the above considered, whilst evaluating risks and implementing reasonably practicable measures is necessary to comply with the GED, the basis for any noise emission assessment will be ensuring that noise emissions are not deemed 'unreasonable'.

6.1. EPA Publication 1826.4 – Noise Protocol

6.1.1. General Methodologies

The subject site land and the sensitive receptors located within proximity of the subject site are **not** located within a 'major urban area' and will therefore be defined as a 'rural area' in accordance with the Noise Protocol.

In consideration of the above, relevant noise limits for addressing noise emissions from the site will be determined in accordance with Part I, A2 of the Noise Protocol referenced as the 'rural area method'.

Further to the above, the proposal will be considered as 'earth resources' and will be subject to specific requirements in accordance with the Noise Protocol. In consideration of the above, relevant limits will be determined in accordance with the methodologies nominated in Section 2.7 of the Noise Protocol.

The calculated 'noise limits' vary depending on the time of the day, evening, or night with the highest permitted values occurring during day periods and the lowest during night periods. The relevant day, evening, and night assessment periods are shown in Table 3.

Table 3: Details of EPA Assessment Periods

EPA Assessment Period	Relevant Days	Relevant Time Periods
Day	Monday to Saturday	7:00am to 6:00pm
Evening	All Days	6:00pm to 10:00pm
	Sunday, Public Holidays	7:00am to 6:00pm
Night	All Days	10:00pm to 7:00am

In accordance with the Noise Protocol, 'zoning levels' for commercial and industrial noise emissions are determined based on the land zoning for the 'noise generator' and the 'noise receiver'. Where relevant, 'zoning levels' can then be adjusted based on the distance separation between the noise generating zone and the noise receivers, and by the presence of elevated 'ambient background' noise levels.

Special provisions are also made for specific use types including earth resource activities.

6.1.2. Derivation of Noise Protocol Noise Limits

The proposed use will be defined as an **earth resources premises** and hence will be subject to special provisions in the Noise Protocol. The surrounding sensitive residential receptors occupy both Rural Conservation Zone (RCZ) land and Green Wedge Zone (GWZ) land, as summarised below:

Rural Conservation Zone (RCZ)

- **R01** – 165 McMahons Road.
- **R02** – 155 McMahons Road.
- **R03** – 145 McMahons Road.
- **R04** – 115 McMahons Road.
- **R05** – 70 Ure Creek Road.
- **R06** – 60 Ure Creek Road.
- **R07** – 50 Ure Creek Road.
- **R08** – 40 Ure Creek Road.
- **R09** – 10 Parrot Road.
- **R10** – 35 Parrot Road.
- **R11** – 23 Westridge Road.

Green Wedge Zone (RCZ)

- **R12** – 19 Westridge Road.
- **R13** – 9 Westridge Road.
- **R14** – 109 Moora Road.

Based on the land zoning of the nearby sensitive receptors, the corresponding 'earth resources' zoning levels will be as shown below.

Table 4: Earth Resources Noise Protocol Zone Levels

EPA Assessment Period	Relevant Days	Time Periods	Noise Protocol Zone Levels	
			R01-R11	R12-R14
Day	Monday to Saturday	7:00am to 6:00pm	45 dB(A) L_{eq}	46 dB(A) L_{eq}
Evening	Monday to Saturday	6:00pm to 10:00pm	38 dB(A) L_{eq}	41 dB(A) L_{eq}
	Sunday, Public Hols.	7:00am to 10:00pm		
Night	All Days	10:00pm to 7:00am	33 dB(A) L_{eq}	36 dB(A) L_{eq}

A distance adjustment will not be applicable for the described earth resource levels, therefore the values can only be adjusted based on the presence of elevated background noise levels in the surrounding environment.

In order to determine whether the critical sensitive receptors are located within a background relevant area, WMG has reviewed the results of unattended noise monitoring within the surrounding area during the period Tuesday 18th June to Thursday 20th June 2024.

The permitted operating hours for the subject site are between 6:30am and 6:00pm Monday to Friday, and between 7:00am and 2:00pm Saturday. There are no operations on Sunday. In consideration of the above, WMG has focused on the monitoring results during these periods.

The monitoring was undertaken at the R01 and R04 receptors located to the southwest of the subject site as it was previously established during investigations undertaken in 2020-2022 that the receptors located to the north of the site were not within a 'background relevant' area.

The monitoring locations are identified below.

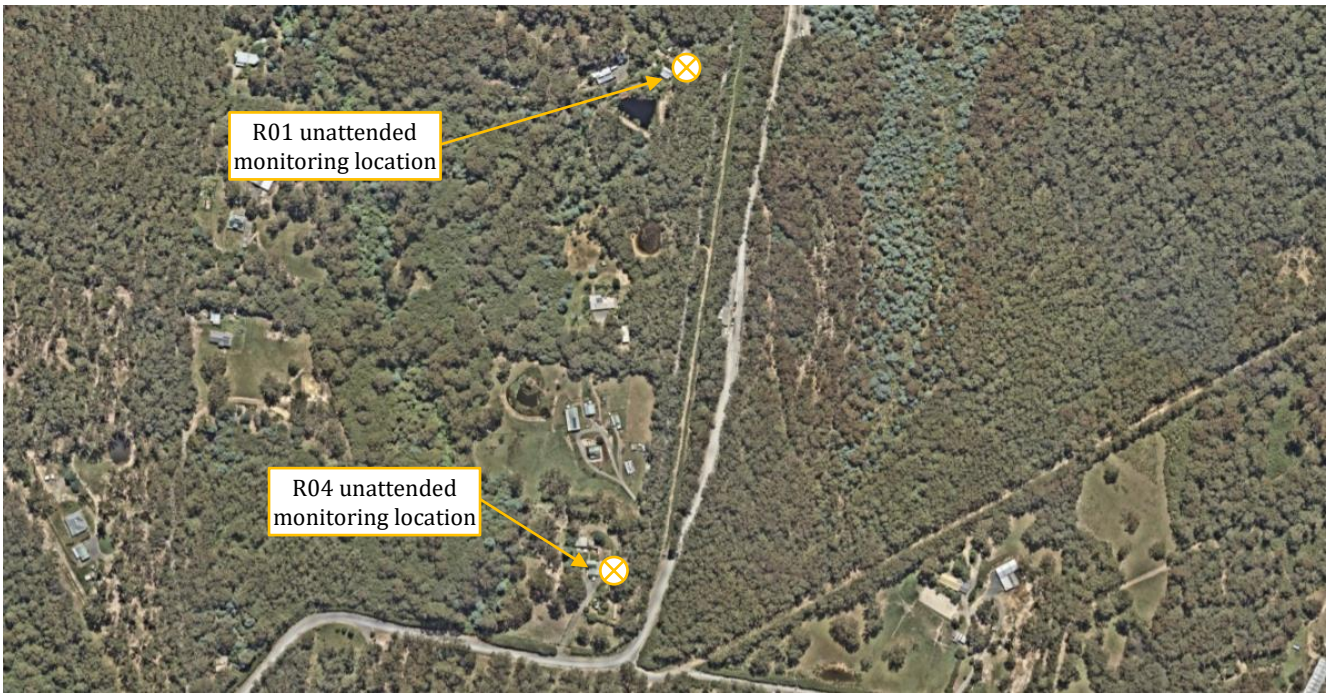


Figure 2: Aerial image identifying unattended noise monitoring locations

The R01 receptor was selected to be representative of the R01-R03 and R05-R08 receptors. R04 was selected to be representative of R04, R09 and R10.

Through analysis of the monitoring results, WMG confirmed that the ambient background noise levels at R01 are low enough that they will not influence the 'zoning' levels described in Table 4. When considered at R04 however, the measured ambient background noise levels during the early morning period between 6:30am and 7:00am were in the order of 30 dB(A)L_{90} and were therefore 'background relevant'.

In accordance with the Noise Protocol, where a background level assessment has been conducted:

- For the day period, the noise limit will be equivalent to the greater of the 'zoning level' of the ambient background noise level plus 8dB(A).
- For the evening & night period, the noise limit will be equivalent to the greater of the 'zoning level' of the ambient background noise level plus 5dB(A).

In consideration of the above, and for the purposes of this assessment, the adopted Noise Protocol noise limits will be as shown below.

Table 5: Adopted Noise Protocol Noise Limits

Assessment Period	Relevant Days	Time Periods	Adopted Noise Protocol Noise Limits		
			R01-R03, R05-R08, R11	R04, R09, R10	R12-R14
Day	Monday to Saturday	7:00am to 6:00pm	45 dB(A) L_{eq}	45 dB(A) L_{eq}	46 dB(A) L_{eq}
Evening	Monday to Saturday	6:00pm to 10:00pm	38 dB(A) L_{eq}	38 dB(A) L_{eq}	41 dB(A) L_{eq}
	Sunday, Public Hols.	7:00am to 10:00pm			
Night	All Days	10:00pm to 7:00am	33 dB(A) L_{eq}	35 dB(A) L_{eq}	36 dB(A) L_{eq}

The noise limit must be met within a 'noise sensitive area', which for this site will be within the boundary of any of the nearby sensitive receptors, and within 10 metres of the outside of the external walls of the dwelling or building.

The relevant assessment period will be 30 minutes.

6.1.3. Noise Protocol Assessment Adjustments

When considering noise impacts at residential receptors, Noise Protocol methodology includes relevant adjustment factors which account for the potential for the noise source to impact on the acoustic amenity of the noise sensitive receptor. The relevant adjustments include:

- Tonal Adjustment
- Impulsive Adjustment.
- Intermittency Adjustment.
- Reflection Adjustment.
- Duration Adjustment.

Clarification regarding each of the adjustments is shown below in Table 6.

Table 6: Noise Protocol Assessment Adjustments

Relevant Adjustment	Description
Tonal Adjustment	When the noise is tonal in character then an adjustment shall be made as follows: ▪ When the tonal character of the noise is just detectable then + 2 dB(A). ▪ When the tonal character of the noise is prominent then + 5 dB(A).
Impulsive Adjustment	When the noise is impulsive in character then an adjustment shall be made as follows: ▪ When the impulsive character of the noise is just detectable then + 2 dB(A). ▪ When the impulsive character of the noise is prominent then + 5 dB(A).
Intermittency Adjustment	An intermittency adjustment applies when the noise increases in level rapidly by at least 5 dB, on at least two occasions during a 30-minute period and maintains the higher level for at least one minute duration. The relevant intermittency adjustments applicable include: ▪ When the level increase is >10 dB during the day period, then apply an adjustment of +3 dB(A). ▪ When the level increase is 5-10 dB during the night period, then apply an adjustment of +3 dB(A). ▪ When the level increase is >10 dB during the night period, then apply an adjustment of +5 dB(A).
Reflection Adjustment	When the measurement point is located outdoors and the microphone is located from 1 to 2 metres from an acoustically reflecting surface, an adjustment of -2.5 dB shall be made.
Duration Adjustment	When the noise emissions do not occur over the whole of a continuous 30-minute period, then a duration adjustment based upon the total amount of time for which the noise occurs over that continuous 30-minute period shall be determined.

Where applicable, adjustments are applied to the measured/predicted values at noise sensitive receptor locations to determine the 'effective' noise level impacting on the receptor.

7. Field Assessment of Current Noise Emissions

7.1. Site Configuration and Operating Parameters

The current Permit allows for the following operating hours:

- Monday to Friday 6:30am to 6:00pm.
- Saturday 7:00am to 2:00pm.
- Sunday – no operations.
- Blasting is prohibited outside the times of 9:00am to 5:00pm Monday to Friday.

Based on discussions with the client, it is understood that the main site processing plant typically operates during the period 7:00am to 6:00pm Monday to Friday, and 7:00am to 2:00pm on Saturday. During the early morning between 6:30am and 7:00am Monday to Friday, operations are generally limited to loading and dispatch from the site.

The existing site configuration includes a maintenance workshop, main crushing plant, stockpiling areas, and the sales areas adjacent to the western site boundary in closest proximity to the R01-R08 receptors. Vehicle access to the site is provided via a dedicated access road located adjacent to the western boundary which connects to McMahons Road.

This is illustrated below in Figure 3.

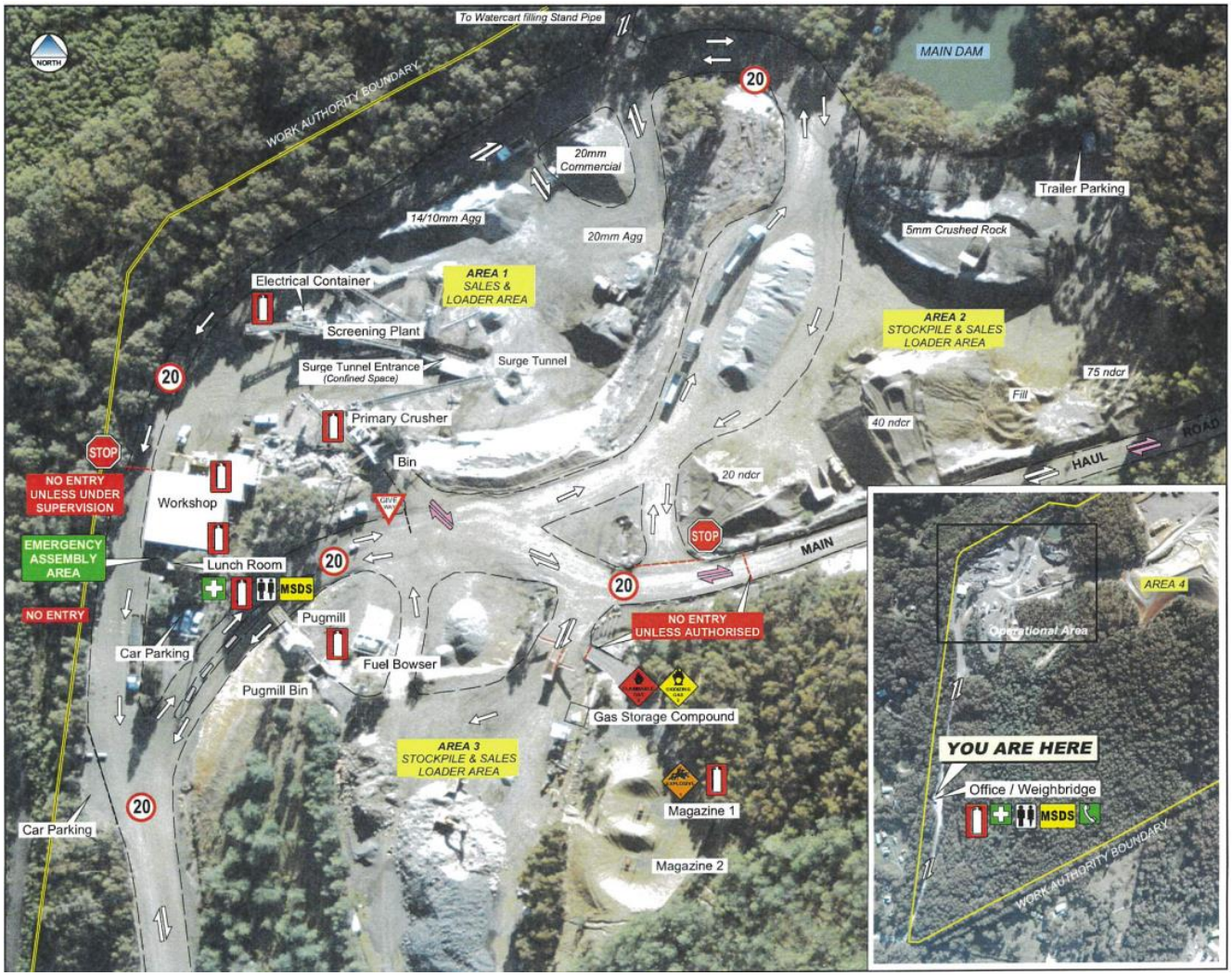


Figure 3: Location of main site operations

7.2. Relevant Noise Sources Identified During Site Investigations

Based on discussions with the client, and through observations during site investigations, the relevant noise sources which form part of typical site operations include:

- Primary crushing plant.
- Screens.
- Front end loader.
- Haul trucks travelling between pit and crushing area.
- Excavator located within extraction pit.
- Sales trucks travelling within site boundaries and along access road.

In addition to the above, a hydraulic rock drill will be used from time to time.

A summary of the source sound power levels associated with the described equipment is included below. The source sound power levels have been derived based on measurements conducted at the existing quarry in combination with WMGs records from previous similar projects.

Table 7: Adopted source sound power levels

Noise Source	Adopted Sound Power Level
Primary crushing plant	120 dB(A)
Screens	111 dB(A)
CAT 980K loader	108 dB(A)
Komatsu HD465 Haul Truck – loaded travelling uphill	119 dB(A)
Komatsu HD465 Haul Truck – unloaded travelling downhill	113 dB(A)
CAT 773B Haul Truck – Exhaust side loaded travelling uphill	119 dB(A)
CAT 773B Haul Truck – unloaded travelling uphill	116 dB(A)
Volvo EC7000CL Excavator – loading haul truck in pit	109 dB(A)
Hydraulic Rock Drill	117 dB(A)
Typical Road Truck	104 dB(A)

7.3. Site Noise Monitoring and Assessment Locations

In order to consider current noise emissions from the existing subject site operations, WMG has undertaken attended and unattended noise monitoring both within the site boundaries, and at the nearest residential receptors located to the southwest of the subject site.

The southwest receptors were selected as they are the closest to the subject site operations, including the site access route which carries site vehicles during the early morning period.

It was anticipated that where compliance with Noise Limits was achieved at these receptors, compliance would also be achieved at the northern receptors (R11-R14).

The monitoring was undertaken during the following periods:

- Attended monitoring during the period 6:00am and 10:00am on Wednesday 19th June 2024.
- Unattended monitoring during the period Tuesday 18th June to Thursday 20th June 2024.

An aerial image of the unattended noise monitoring locations is included below.

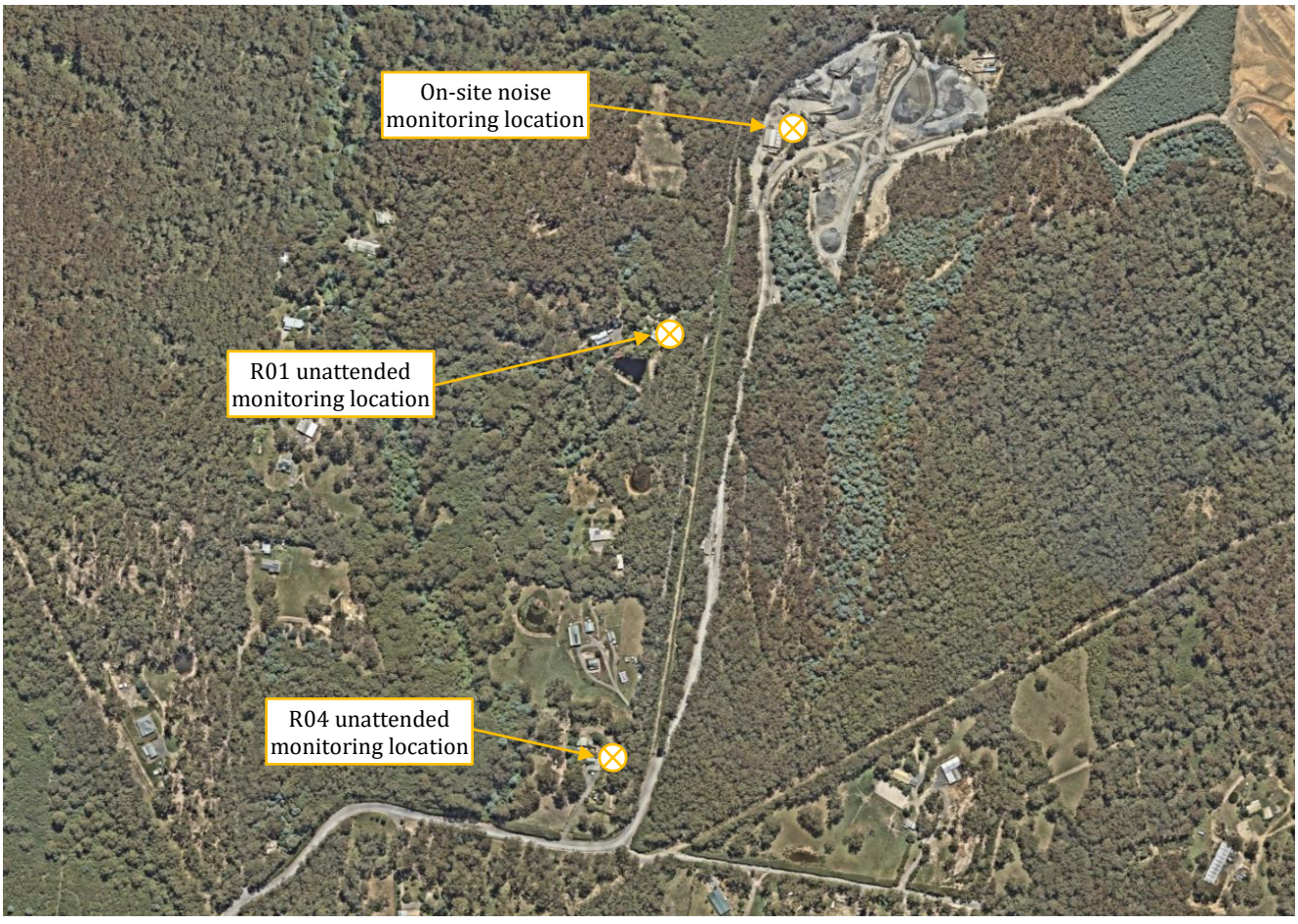


Figure 4: Aerial image identifying unattended noise monitoring locations

7.3.1. Noise Protocol Noise Assessment

7.3.1.1. Early Morning Period – Loading and Dispatch (6:30am to 7:00am)

For the purposes of this assessment, WMG has focused on the monitoring results obtained during the early morning between 6:30am and 7:00am on Wednesday 19th June 2024.

The period was selected as breeze conditions included a light northeasterly component assisting with propagation of noise from the subject site in the direction of the critical receptor locations to the southwest of the site.

Further to the above, WMG was also in attendance at the site, and hence could provide subjective commentary on the operations, and their associated noise impacts at the nearby residential properties.

During the monitoring period, WMG identified five vehicles entering the subject site, and one vehicle exiting the site.

In addition, WMG identified noise associated with on-site mobile equipment which was logically being used to load trucks prior to departure from the site. The noise level trace at each monitoring location is included below.

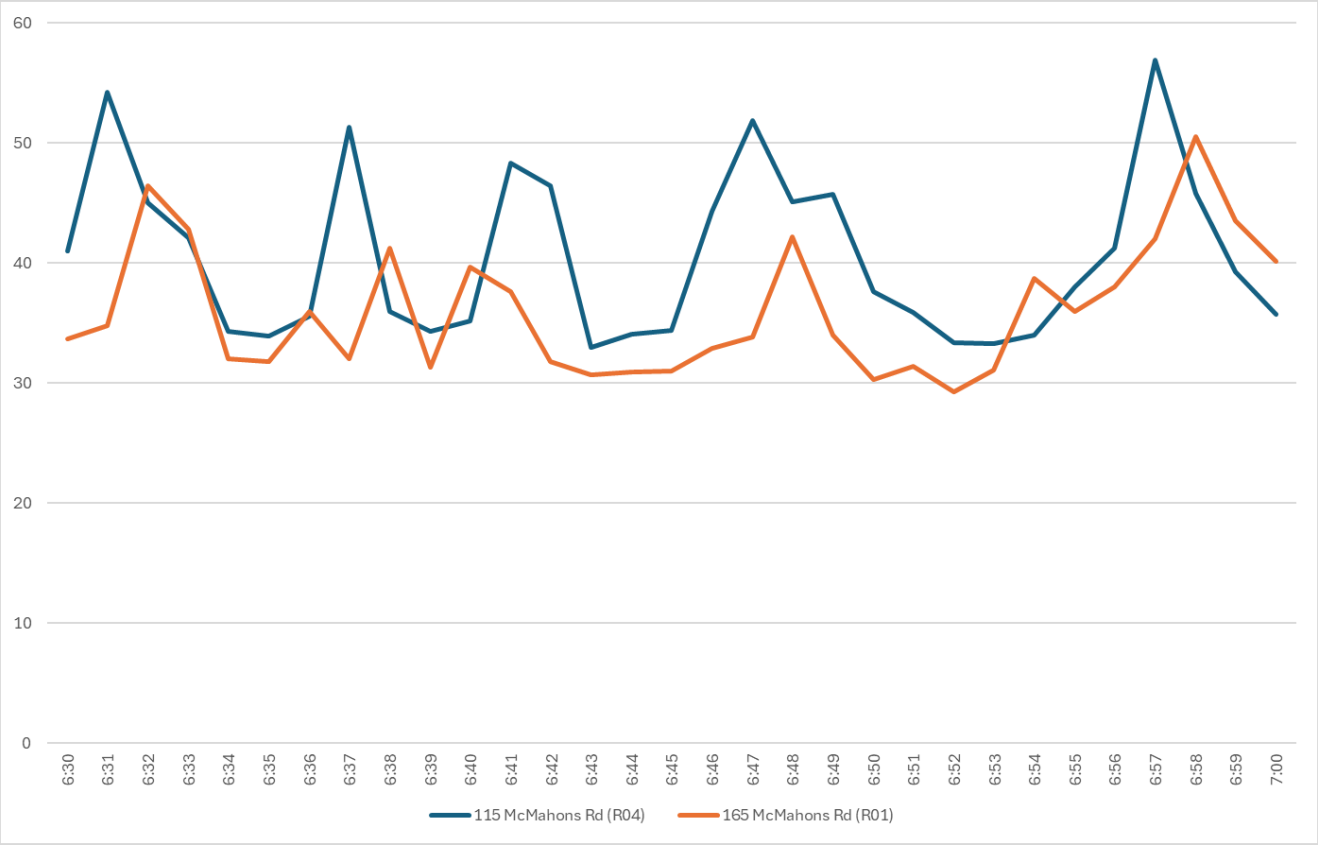


Figure 5: Noise monitoring trace at R01 and R04 receptor - 1min LAeq - 6:30am to 7:00am Wednesday 19th June 2024

When considered relative to the Noise Protocol early morning (night) period noise limits, the resultant noise impacts will be assessed over any 30-minute period. WMG has therefore determined the equivalent 30-minute noise level for the 6:30am to 7:00am period.

Furthermore, due to the nature of the truck noise, the assessment will include a tonal character adjustment of +2dB(A) to account for the diesel engine tonal component which was observed to be present during site investigations.

It must be noted that in accordance with the Noise Protocol, noise due to the trucks will only be assessable when they are located within the boundaries of the subject site. When located on public roads they are not assessable.

In consideration of the above, the measured noise impacts at the R04 are expected to overstate the assessable noise impacts at the associated residential receptor. It would be expected that the assessable noise impacts may be in the order of 6-7dB(A) below the measured values due to the reduced duration of the event.

For clarity, the areas which are understood to be within the site boundaries (assessable), and outside the boundaries (non-assessable) are identified below.

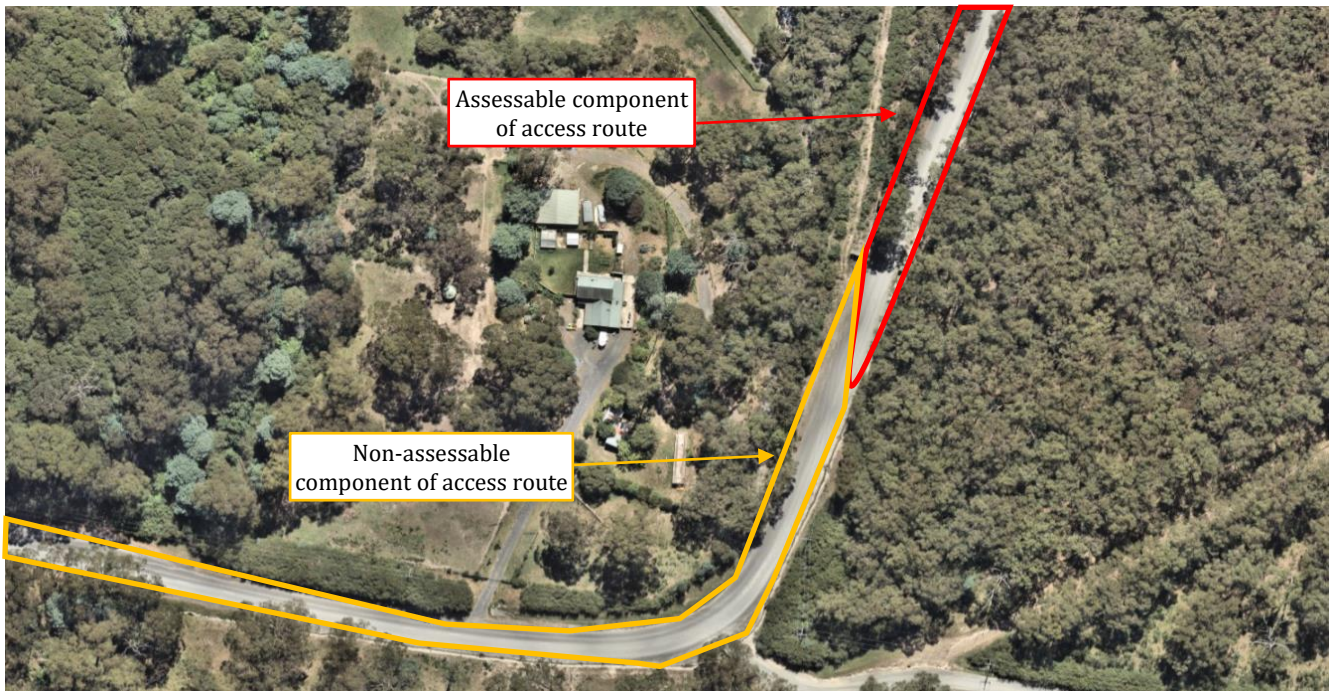


Figure 6: Aerial image identifying assessable and non-assessable truck route

A summary of the noise impact assessment at each of the critical receptor locations is included below.

Table 8: Noise Protocol Assessment – Early morning period R01 and R04

Assessment Location	Measured Level dB(A) $L_{eq(30min)}$	Tonal Adjustment	Effective Noise Level dB(A) $L_{eq(30min)}$	Noise Protocol Limit		
				Day	Evening	Night
R01 – 165 McMahons Rd	39-40	2 dB(A)	41-42	45	38	33
R04 – 115 McMahons Rd	40*-47 dB(A)	2 dB(A)	42*-49	45*	38	35

** Note – lower noise level estimated based on 'assessable' noise.*

Based on the observations of the attending consultant, WMG provide the following comments regarding the sources of noise which were audible during the assessment period:

- Noise due to trucks accelerating and travelling up the access route.
- Noise due to trucks braking and using engine brakes as they descend the entry route.
- Noise due to mobile plant warming up and moving within site boundaries. On occasion this included tonal reverse beepers which, if more constant, may increase the tonal adjustment to +5dB(A).

The assessment outcomes indicate non-compliance with the early morning noise limits, primarily due to the resultant noise impacts associated with truck movements.

7.3.1.2. Day Period – General Operations (7:00am to 6:00pm)

As for the early morning assessment, and for the purposes of this assessment, WMG has focused on the monitoring results obtained during the day period of Wednesday 19th June 2024.

The results of the 30-minute 'rolling' noise impacts occurring at the R01 and R04 receptors, as well as at the on-site reference noise monitoring location is included below. WMG has also included the day period Noise Protocol noise limit for reference and comparison.

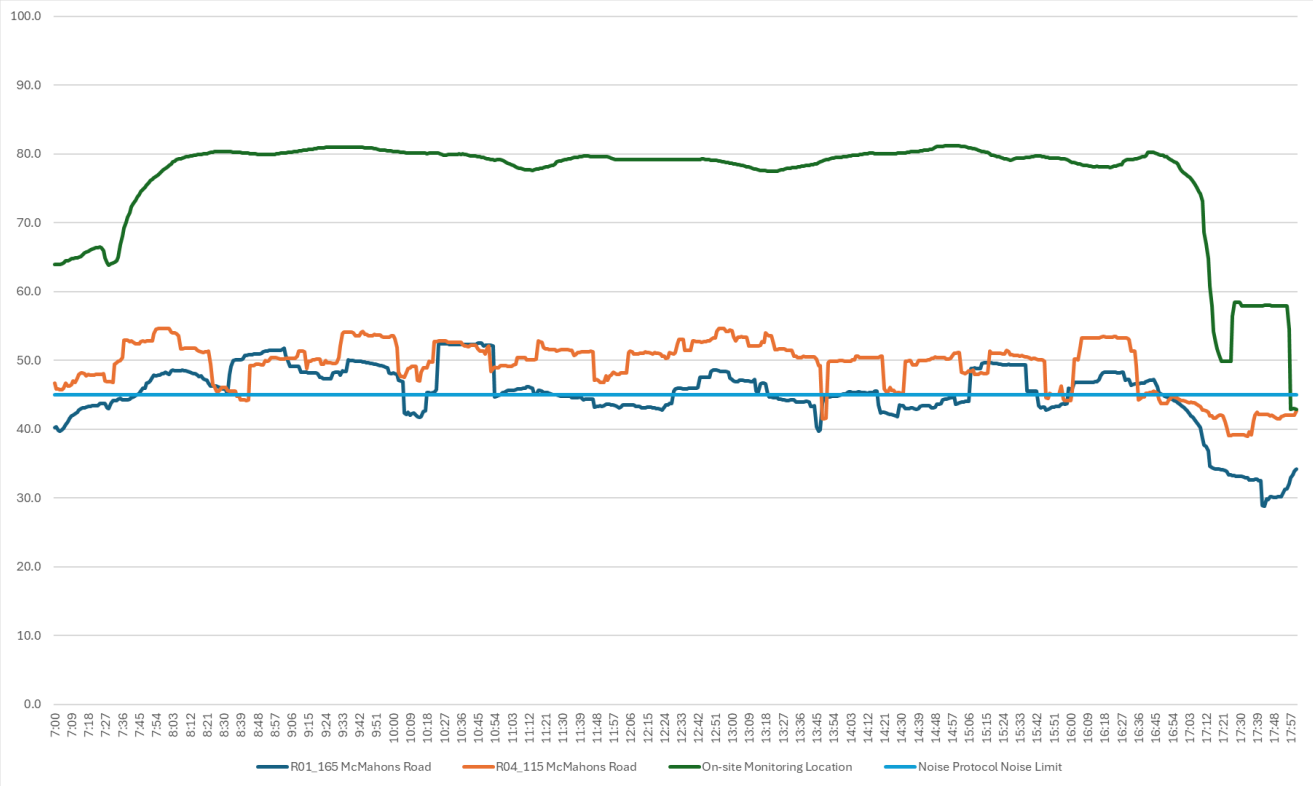


Figure 7: Rolling 30-minute noise impacts at off-site receptors and at on-site reference monitoring location

As is shown above, noise impacts at the R01 and R04 receptor locations were consistently measured to be above the Noise Protocol noise limits. Furthermore, due to the nature of the truck noise, which was audible during the period of the assessment, a tonal character adjustment of +2dB(A) will be added to the values, hence increasing the magnitude of the noise limit exceedances.

Based on the observations of the attending consultant, WMG provide the following comments regarding the sources of noise which were audible during the assessment period:

- The R01 receptor was the most impacted by noise associated with general operations occurring at the site. During 'typical' operations residual noise impacts at the receptor were in the order of 46-47 dB(A) L_{eq}.
- The highest exceedances generally occurred during times when there were increased vehicle movements along the access road. Trucks were identified as utilising engine brakes, and accelerating resulting in noise levels higher than what may be possible if drivers are educated accordingly.
- On occasion tonal reverse beepers were audible which may increase the tonal adjustment to +5dB(A).

7.3.1.3. Current Operations Assessment Discussion

The results of the assessment at the R01 and R04 receptors have identified the following:

- Noise emissions associated with operations at the subject site, and in particular noise due to vehicle movements along the site access road, are currently non-compliant with Noise Protocol noise limits during the early morning between 6:30am and 7:00am.
- Noise emissions associated with general site operations, including use of the primary crusher are non-compliant with the Noise Protocol day period noise limit.

In consideration of the above, operations at the subject site will need to be changed to ensure compliance with Noise Protocol noise limits.

8. Noise Modelling for Current Site Operations

8.1. Noise Prediction Methodology

Modelling of operational noise emissions from the site has been conducted using DataKustik CadnaA environmental noise modelling software.

Relevant information regarding site elevations, site buildings and the surrounding environment has been provided by the client and sourced from online databases including Nearmaps and topography from the ANZLIC Committee on Surveying and Mapping.

The model has been developed with sufficient detail for appropriate noise emission calculations to be undertaken.

For this assessment, the modelling software has implemented the calculation procedures defined within International Standard ISO 9613-2: 1996 Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation (ISO 9613).

The described standard has been considered and approved as part of many previous projects requiring noise emission assessment works.

Through implementation of the Standard using CadnaA, the model considers the following attenuation measures:

- Geometrical spreading.
- Atmospheric absorption.
- Ground attenuation.
- Meteorological effects.
- Source/Receiver height effects.
- Attenuation due to the surrounding environment including existing buildings/structures.

The modelling input parameters also incorporate assessment methodology requirements of EPA Victoria including:

- Residual noise levels at noise sensitive receptor locations have been considered when weather conditions assist with propagation of emissions in the direction of the relevant receptor.
- Predicted values have been considered within 10 metres of the noise sensitive external facades.

The critical receptors located in proximity to the site include both single and multi-level dwellings. For the purposes of this assessment, a height of 1.5m above ground level has been adopted for ground level locations. For upper levels of multi-level dwellings, an assessment of 4.5m above ground level has been adopted.

Predicted values at receptor locations have been calculated in the 'free-field', which do not include reflections from localised surfaces other than the ground.

8.2. Calibration of Noise Model with Current Site Operations

In the first instance, WMG has utilised the 3D noise model to calibrate the resultant noise impacts at the R01 and R04 receptors which have been measured as part of the field assessment.

For the purposes of the noise model, WMG has included truck movements along the extent of McMahons Road which includes non-assessable land beyond the site boundary (refer Figure 6), in order to accurately compare the noise model with the measured values obtained as part of the site investigations.

WMG has then reduced the extent of the truck travel path so that it stops within the boundaries of the subject site to understand the 'assessable' noise impact at the sensitive receptors in accordance with the requirements of the EPA.

A summary of the calibrated noise modelling results, compared with the site measured values is included below.

Table 9: Comparison of noise modelling results with site monitoring results

Assessment Location	Operating condition (per 30min)	Modelled noise level	Measured Noise Level
Early morning period			
R01 – 165 McMahons Rd	▪ 6 truck movements (total). ▪ Loader operating in sales area.	40 dB(A) $L_{eq(30min)}$	39-40 dB(A) $L_{eq(30min)}$
R04 – 115 McMahons Rd (assessable + non-assessable extent of road)		46 dB(A) $L_{eq(30min)}$	46-47 dB(A) $L_{eq(30min)}$
R04 – 115 McMahons Rd (assessable route only)		40 dB(A) $L_{eq(30min)}$	Not possible to accurately assessed at receptor.
Typical day period operations			
R01 – 165 McMahons Rd	▪ 8-10 truck movements (total). ▪ Loader operating in sales area. ▪ Main plant operating. ▪ Excavator operating in pit. ▪ Haul trucks travelling between the pit and the main plant area. ▪ primary crusher operating.	48 dB(A) $L_{eq(30min)}$	48 dB(A) $L_{eq(30min)}$
R04 – 115 McMahons Rd (assessable + non-assessable extent of road)		49 dB(A) $L_{eq(30min)}$	50 dB(A) $L_{eq(30min)}$
R04 – 115 McMahons Rd (assessable route only)		46 dB(A) $L_{eq(30min)}$	Not possible to accurately assessed at receptor.

As is shown above, the outcomes of the noise model indicate a good level of calibration. WMG has therefore used the noise model as the basis for identifying the dominant noise sources forming part of the current site operations which require change to reduce noise impacts at the critical receptors.

8.3. Operating Requirements to Bring Current Operations into Noise Protocol Compliance

8.3.1. Early morning operations (6:30am to 7:00am)

Through evaluation of the noise model, WMG has determined that use of the access road by trucks will not be possible during the early morning period whilst achieving compliance with the Noise Protocol noise limits.

In consideration of the above, vehicles will not be able to enter/exit the site prior to 7:00am.

The client has advised that the current operations include two sales trucks which are stored at site overnight and are loaded first thing in the morning from 6:30am.

WMG has updated the noise model to remove trucks travelling along the access route, and included two trucks idling within the sales/loading/plant area, whilst being loaded by the sales wheel loader.

The results of the noise model are included below.

Table 10: Early morning assessment – loading of site-based trucks in sales area

Receptor Location	Predicted Noise Level	Tonal Adjustment	Effective Noise Level	Noise Limit
R01 – 165 McMahons Road.	31 dB(A) L_{eq}	+2 dB	33 dB(A) L_{eq}	33 dB(A)
R02 – 155 McMahons Road.	30 dB(A) L_{eq}	+2 dB	32 dB(A) L_{eq}	33 dB(A)
R03 – 145 McMahons Road.	29 dB(A) L_{eq}	+2 dB	31 dB(A) L_{eq}	33 dB(A)
R04 – 115 McMahons Road.	25 dB(A) L_{eq}	+2 dB	27 dB(A) L_{eq}	35 dB(A)
R05 – 70 Ure Creek Road.	<20 dB(A) L_{eq}	+2 dB	<20 dB(A) L_{eq}	33 dB(A)
R06 – 60 Ure Creek Road.	20 dB(A) L_{eq}	+2 dB	22 dB(A) L_{eq}	33 dB(A)
R07 – 50 Ure Creek Road.	30 dB(A) L_{eq}	+2 dB	32 dB(A) L_{eq}	33 dB(A)
R08 – 40 Ure Creek Road.	29 dB(A) L_{eq}	+2 dB	31 dB(A) L_{eq}	33 dB(A)
R09 – 10 Parrot Road.	<20 dB(A) L_{eq}	+2 dB	<20 dB(A) L_{eq}	35 dB(A)
R10 – 35 Parrot Road.	<20 dB(A) L_{eq}	+2 dB	<20 dB(A) L_{eq}	35 dB(A)
R11 – 23 Westridge Road.	20 dB(A) L_{eq}	+2 dB	22 dB(A) L_{eq}	33 dB(A)
R12 – 19 Westridge Road.	21 dB(A) L_{eq}	+2 dB	23 dB(A) L_{eq}	36 dB(A)
R13 – 9 Westridge Road.	21 dB(A) L_{eq}	+2 dB	23 dB(A) L_{eq}	36 dB(A)
R14 – 109 Moora Road.	<20 dB(A) L_{eq}	+2 dB	<20 dB(A) L_{eq}	36 dB(A)

As is shown above, the outcomes of the noise model indicate that residual noise impacts will comply with the Noise Protocol noise limits during the early morning period.

Should the sales wheel loader or trucks be required to 'warm up' during the early morning, this should be done within the trailer parking area adjacent to the main dam. Trucks must not use the access road prior to 7:00am.

8.3.2. Day period operations (7:00am to 6:00pm)

The results of the site noise monitoring, and the calibrated 3D noise model have confirmed that the primary crushing plant cannot operate at its current location whilst complying with Noise Protocol noise limits at the nearby receptors.

In consideration of the above, the client has evaluated their operations and considered what reasonably practicable measures can be implemented at site to reduce noise emissions associated with the primary crusher.

The client has determined that they can feasibly relocate the primary crushing plant in the order of 400m to the east of the main plant location. A haul truck will then be used to transfer crushed materials to the secondary and tertiary crushing hopper. This is illustrated below.

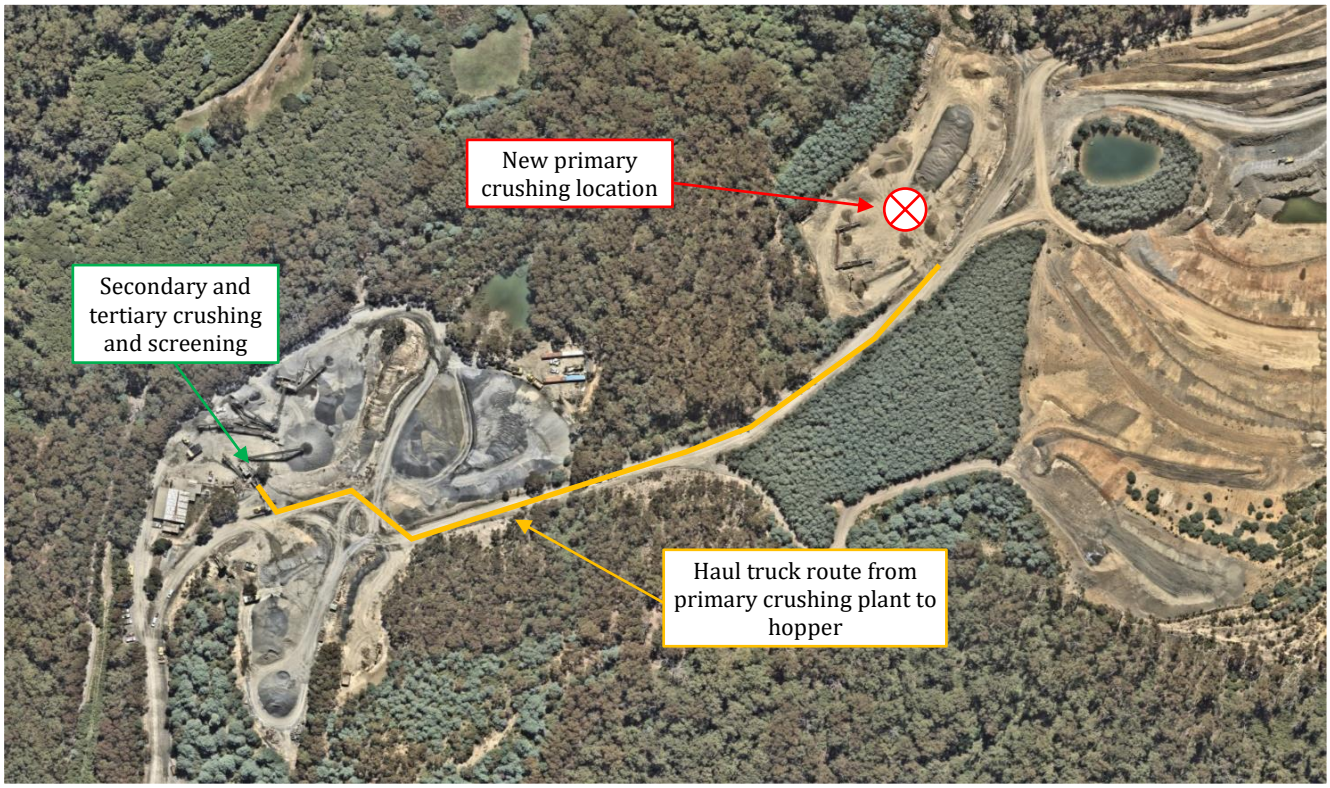


Figure 8: Aerial image including new location of primary crushing plant and haul truck route

In order to comprehensively consider the potential noise impacts associated with the changed site operations, WMG has used the calibrated noise model to predict noise impacts at each of the sensitive receptors surrounding the site.

For the purposes of this assessment, WMG has included a plus 2dB tonal character adjustment which WMG anticipates will be present at the sensitive receptors due to the operation of the crusher and/or diesel engine mobile equipment.

Further to the above, WMG has reduced the source sound power levels for the trucks utilising the site access road during the day period from 104 dB(A) to 101 dB(A).

This has been amended based on discussions with the client in relation to educating drivers, and enforcing restrictions on drivers to ensure that they reduce their noise emission during typical daily operations. The 101 dB(A) values align with the lower values measured as part of the site investigations during times when vehicles were not using engine brakes and appeared to be 'reasonable' with their behaviour.

The results of the noise model are summarised below.

Table 11: Day period assessment – typical day period operations – including relocation of primary crushing plant

Receptor Location	Predicted Noise Level	Tonal Adjustment	Effective Noise Level	Noise Limit
R01 – 165 McMahons Road.	42 dB(A) L_{eq}	+2 dB	44 dB(A) L_{eq}	45 dB(A)
R02 – 155 McMahons Road.	39 dB(A) L_{eq}	+2 dB	41 dB(A) L_{eq}	45 dB(A)
R03 – 145 McMahons Road.	40 dB(A) L_{eq}	+2 dB	42 dB(A) L_{eq}	45 dB(A)
R04 – 115 McMahons Road.	41 dB(A) L_{eq}	+2 dB	43 dB(A) L_{eq}	45 dB(A)
R05 – 70 Ure Creek Road.	29 dB(A) L_{eq}	+2 dB	31 dB(A) L_{eq}	45 dB(A)
R06 – 60 Ure Creek Road.	32 dB(A) L_{eq}	+2 dB	34 dB(A) L_{eq}	45 dB(A)
R07 – 50 Ure Creek Road.	39 dB(A) L_{eq}	+2 dB	41 dB(A) L_{eq}	45 dB(A)
R08 – 40 Ure Creek Road.	39 dB(A) L_{eq}	+2 dB	41 dB(A) L_{eq}	45 dB(A)
R09 – 10 Parrot Road.	29 dB(A) L_{eq}	+2 dB	31 dB(A) L_{eq}	45 dB(A)
R10 – 35 Parrot Road.	27 dB(A) L_{eq}	+2 dB	29 dB(A) L_{eq}	45 dB(A)
R11 – 23 Westridge Road.	36 dB(A) L_{eq}	+2 dB	38 dB(A) L_{eq}	45 dB(A)
R12 – 19 Westridge Road.	37 dB(A) L_{eq}	+2 dB	39 dB(A) L_{eq}	46 dB(A)
R13 – 9 Westridge Road.	37 dB(A) L_{eq}	+2 dB	39 dB(A) L_{eq}	46 dB(A)
R14 – 109 Moora Road.	34 dB(A) L_{eq}	+2 dB	36 dB(A) L_{eq}	46 dB(A)

As is shown above, with the relocation of the primary crushing plant operations, the outcomes of the model indicate that residual noise impacts will comply with the Noise Protocol noise limits during the day period.

9. Assessment of Proposed Extension of Operations

9.1. Proposed Configuration and Staging

It is understood that the proposed expansion will maintain the use of the existing mobile equipment (excavators, haul trucks etc) which is operating at the subject site with their operations relocated to the new extraction area.

The main screening plant will remain in its current location adjacent to the site access road, with the primary crushing plant relocated as discussed in Section 8.3.2.

In consideration of the above, the main variation in the proposed future operations will be the introduction of mobile equipment in closer proximity to the receptors located to the north of the subject site.

Figure 9 below provides the staging of the project.

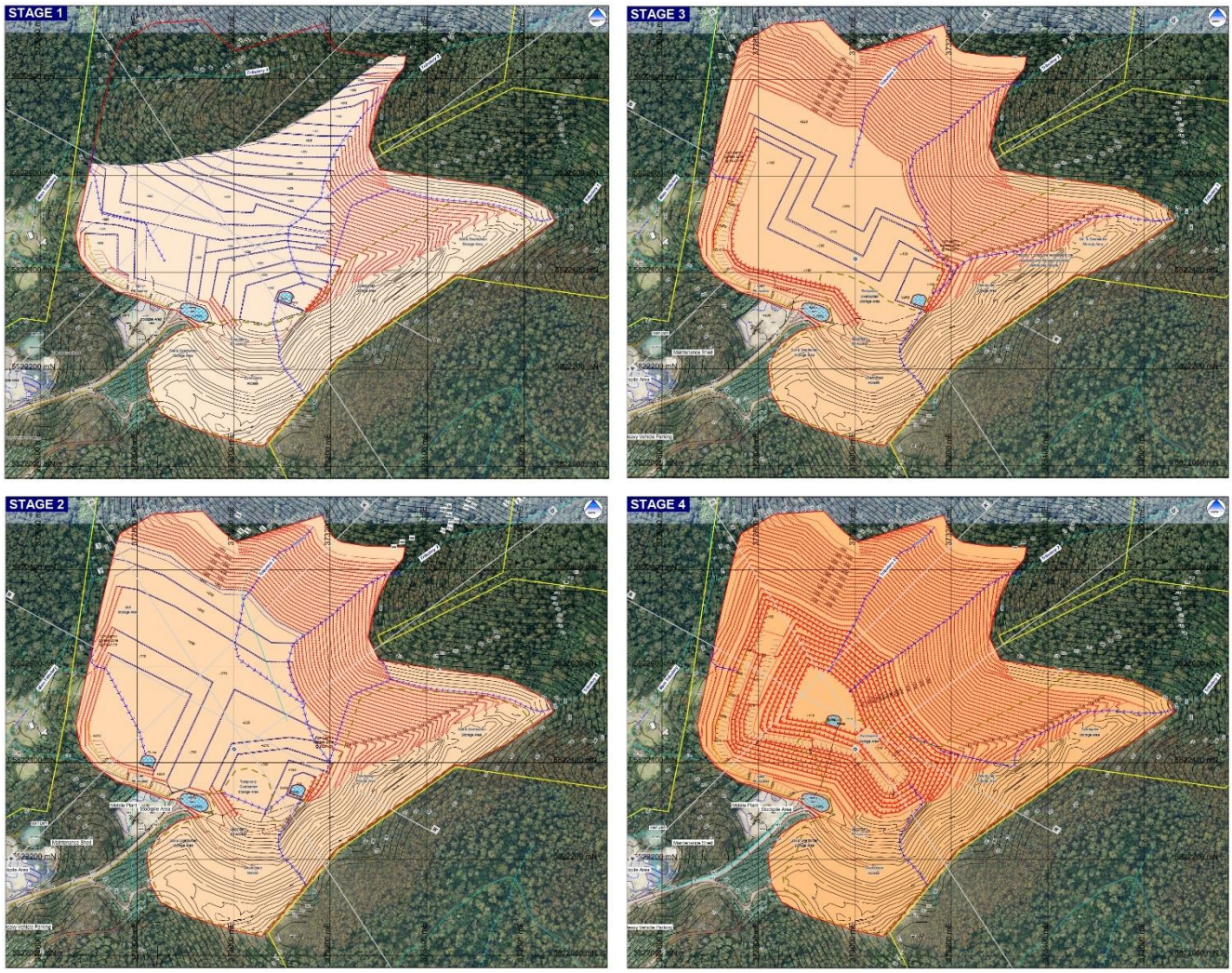


Figure 9: Stage Plan for Proposed Expansion

9.2. Predicted Noise Levels

During the initial stages of the expansion, the mobile extraction equipment will be located at surface level, hence resulting in the highest noise impacts at receptors surrounding the subject site. As the excavation progresses, the noise sources will begin to receive noise shielding in the direction of sensitive receptors.

In consideration of the above, WMG has predicted noise emissions from the proposed operations under the following conditions:

- Early morning period – when the existing loader will load the two site-based trucks within the sales area.
- Day period – including general plant operations combined with new surface activities occurring in the proposed expansion area. This scenario allows for the hydraulic rock drill to also operate within the expansion area.

The results of the noise model are summarised in Tables 12-13 below.

It should be noted that WMG has also included a plus 2dB tonal character adjustment which WMG anticipates may be present at the nearest sensitive receptors due to the operation of the crusher and/or diesel engine mobile equipment.

Table 12: Early morning assessment – loading of site-based trucks in sales area

Receptor Location	Predicted Noise Level	Tonal Adjustment	Effective Noise Level	Noise Limit
R01 – 165 McMahons Road.	31 dB(A) L_{eq}	+2 dB	33 dB(A) L_{eq}	33 dB(A)
R02 – 155 McMahons Road.	30 dB(A) L_{eq}	+2 dB	32 dB(A) L_{eq}	33 dB(A)
R03 – 145 McMahons Road.	29 dB(A) L_{eq}	+2 dB	31 dB(A) L_{eq}	33 dB(A)
R04 – 115 McMahons Road.	25 dB(A) L_{eq}	+2 dB	27 dB(A) L_{eq}	35 dB(A)
R05 – 70 Ure Creek Road.	<20 dB(A) L_{eq}	+2 dB	<20 dB(A) L_{eq}	33 dB(A)
R06 – 60 Ure Creek Road.	20 dB(A) L_{eq}	+2 dB	22 dB(A) L_{eq}	33 dB(A)
R07 – 50 Ure Creek Road.	30 dB(A) L_{eq}	+2 dB	32 dB(A) L_{eq}	33 dB(A)
R08 – 40 Ure Creek Road.	29 dB(A) L_{eq}	+2 dB	31 dB(A) L_{eq}	33 dB(A)
R09 – 10 Parrot Road.	<20 dB(A) L_{eq}	+2 dB	<20 dB(A) L_{eq}	35 dB(A)
R10 – 35 Parrot Road.	<20 dB(A) L_{eq}	+2 dB	<20 dB(A) L_{eq}	35 dB(A)
R11 – 23 Westridge Road.	20 dB(A) L_{eq}	+2 dB	22 dB(A) L_{eq}	33 dB(A)
R12 – 19 Westridge Road.	21 dB(A) L_{eq}	+2 dB	23 dB(A) L_{eq}	36 dB(A)
R13 – 9 Westridge Road.	21 dB(A) L_{eq}	+2 dB	23 dB(A) L_{eq}	36 dB(A)
R14 – 109 Moora Road.	<20 dB(A) L_{eq}	+2 dB	<20 dB(A) L_{eq}	36 dB(A)

Table 13: Day period assessment – typical crushing activities in combination with surface activities in new expansion area

Receptor Location	Predicted Noise Level	Tonal Adjustment	Effective Noise Level	Noise Limit
R01 – 165 McMahons Road.	43 dB(A) L_{eq}	+2 dB	45 dB(A) L_{eq}	45 dB(A)
R02 – 155 McMahons Road.	40 dB(A) L_{eq}	+2 dB	42 dB(A) L_{eq}	45 dB(A)
R03 – 145 McMahons Road.	41 dB(A) L_{eq}	+2 dB	43 dB(A) L_{eq}	45 dB(A)
R04 – 115 McMahons Road.	41 dB(A) L_{eq}	+2 dB	43 dB(A) L_{eq}	45 dB(A)
R05 – 70 Ure Creek Road.	32 dB(A) L_{eq}	+2 dB	33 dB(A) L_{eq}	45 dB(A)
R06 – 60 Ure Creek Road.	35 dB(A) L_{eq}	+2 dB	37 dB(A) L_{eq}	45 dB(A)
R07 – 50 Ure Creek Road.	40 dB(A) L_{eq}	+2 dB	42 dB(A) L_{eq}	45 dB(A)
R08 – 40 Ure Creek Road.	40 dB(A) L_{eq}	+2 dB	42 dB(A) L_{eq}	45 dB(A)
R09 – 10 Parrot Road.	31 dB(A) L_{eq}	+2 dB	33 dB(A) L_{eq}	45 dB(A)
R10 – 35 Parrot Road.	33 dB(A) L_{eq}	+2 dB	35 dB(A) L_{eq}	45 dB(A)
R11 – 23 Westridge Road.	38 dB(A) L_{eq}	+2 dB	40 dB(A) L_{eq}	45 dB(A)
R12 – 19 Westridge Road.	38 dB(A) L_{eq}	+2 dB	40 dB(A) L_{eq}	46 dB(A)
R13 – 9 Westridge Road.	38 dB(A) L_{eq}	+2 dB	40 dB(A) L_{eq}	46 dB(A)
R14 – 109 Moora Road.	35 dB(A) L_{eq}	+2 dB	37 dB(A) L_{eq}	46 dB(A)

Based on the results of the assessment, WMG has concluded the following:

- Noise emissions associated with proposed early morning operations are predicted to comply with Noise Protocol night period noise limits.
- With the relocation of the primary crushing plant, noise emissions associated with the day period operations are predicted to comply with Noise Protocol day period noise limits.

10. Consideration of the Environment Reference Standard (ERS)

The ERS provides environmental values which have been developed to reflect the ambient soundscape associated with different land use settings, from highly urbanised areas to natural environments.

Through consideration of land zoning types, and varying assessment periods for the day and night, it is understood that the ERS intends to provide consideration of noise levels which may impact on:

- Sleep during the night.
- Domestic and recreational activities.
- Normal conversation.
- Child learning and development.
- Human tranquility and enjoyment outdoors in natural areas.
- Musical entertainment.

Whilst being included within the Act, the ERS is not a compliance standard and clearly states that 'the objectives for each land use category are typical ambient sound level values and are neither noise limits nor noise design criteria'.

It's understood that the primary function of the ERS is to provide environmental assessment benchmarks to assist 'decision makers' with evaluating noise emissions within areas not already captured within the Regulations and Noise Protocol.

The ERS will not require consideration when addressing noise emissions from the proposal at the nearby residential premises as these are captured by the Noise Protocol.

Furthermore, given the proximity of the residential receptors to the proposed use, it is expected that compliance with Noise Protocol will adequately address potential impacts within any further setback natural areas.

In consideration of the above, the ERS has not been considered further within the assessment.

11. Consideration of Low Frequency Noise

As defined in the Act, *a person must not, from a place or premises that are not residential premises emit an unreasonable noise or permit an unreasonable noise to be emitted.* In the Regulations, unreasonable noise is based on exceedances determined in accordance with the Noise Protocol, however, the Regulations also include consideration of the frequency spectrum associated with a noise emission.

To provide some basis for addressing low frequency noise emissions and determining whether the noise emission is deemed 'unreasonable' the EPA released Publication 1996 Noise Guideline – assessing low frequency noise.

The guideline document provides 'threshold levels for assessing low frequency noise' which are not set limits, but levels that indicate a potential risk of problematic low frequency noise. The threshold levels for indoor and outdoor measurements are included within Table 14 below.

Table 14: Indoor and outdoor measurement one-third octave band noise level thresholds

Measurement Location	One-third octave band noise levels Hz												
	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160
Indoor noise dB L_{eq}	92	87	83	74	64	56	49	43	42	40	38	36	34
Outdoor noise dB L_{eq}	92	89	86	77	69	61	54	50	50	48	48	46	44

Whilst Publication 1996 is presented as a guideline, it is understood that the EPA will require reasonably practicable measures to be considered where values are measured or predicted to be higher than the thresholds.

The noise modelling software utilised as part of the assessment includes the capability to predict the one-third octave band noise levels at the sensitive receptors. The predicted one-third octave band noise levels within the relevant low frequencies are summarised below.

Table 15: Early morning assessment – loading of site-based trucks in sales area

Measurement Location	One-third octave band noise levels Hz												
	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160
Outdoor threshold	92	89	86	77	69	61	54	50	50	48	48	46	44
R01 165 McMahons Rd.	-	-	-	-	33	40	38	38	38	36	32	31	31
R02 155 McMahons Rd.	-	-	-	-	30	36	35	34	35	33	29	28	28
R03 145 McMahons Rd.	-	-	-	-	29	35	34	33	34	32	27	27	27
R04 115 McMahons Rd.	-	-	-	-	27	33	32	31	32	30	25	25	24
R05 70 Ure Creek Rd.	-	-	-	-	26	32	30	29	28	26	20	19	18
R06 60 Ure Creek Rd.	-	-	-	-	27	33	32	31	31	29	23	23	22
R07 50 Ure Creek Rd.	-	-	-	-	28	34	33	33	34	32	27	27	27
R08 40 Ure Creek Rd.	-	-	-	-	27	33	32	32	33	31	26	26	26
R09 10 Parrot Rd.	-	-	-	-	25	31	30	29	29	27	22	21	20
R10 35 Parrot Rd.	-	-	-	-	20	25	23	22	22	19	13	12	11
R11 23 Westridge Rd.	-	-	-	-	24	30	29	29	30	28	21	20	20
R12 19 Westridge Rd.	-	-	-	-	24	30	29	29	30	28	21	21	20
R13 9 Westridge Rd.	-	-	-	-	24	30	29	29	30	28	21	21	20
R14 109 Moora Rd.	-	-	-	-	19	25	24	24	25	23	18	18	17

Table 16: Day period assessment – typical crushing activities in combination with surface activities in new expansion area

Measurement Location	One-third octave band noise levels Hz												
	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160
Outdoor threshold	92	89	86	77	69	61	54	50	50	48	48	46	44
R01 165 McMahons Rd.	-	-	-	-	46	50	48	48	51	50	45	44	41
R02 155 McMahons Rd.	-	-	-	-	43	47	45	45	48	47	42	41	38
R03 145 McMahons Rd.	-	-	-	-	42	47	45	45	50	48	42	41	38
R04 115 McMahons Rd.	-	-	-	-	42	46	45	44	50	48	42	41	38
R05 70 Ure Creek Rd.	-	-	-	-	41	45	42	41	41	43	38	35	32
R06 60 Ure Creek Rd.	-	-	-	-	41	45	42	42	44	44	39	37	34
R07 50 Ure Creek Rd.	-	-	-	-	42	46	44	44	47	48	42	41	39
R08 40 Ure Creek Rd.	-	-	-	-	42	47	44	44	47	48	42	41	38
R09 10 Parrot Rd.	-	-	-	-	38	42	40	39	42	42	36	34	32
R10 35 Parrot Rd.	-	-	-	-	36	41	38	37	40	42	36	32	32
R11 23 Westridge Rd.	-	-	-	-	39	44	41	41	44	47	40	38	37
R12 19 Westridge Rd.	-	-	-	-	39	44	41	42	44	47	40	38	37
R13 9 Westridge Rd.	-	-	-	-	39	44	42	42	44	47	40	38	37
R14 109 Moora Rd.	-	-	-	-	36	42	39	39	43	46	39	36	36

The results of the noise model indicate that residual noise impacts during the more critical early morning period will be below the low frequency outdoor thresholds at the sensitive receptor locations.

During the day period however, the results of the noise model indicate that resultant noise levels at the R01 receptor may be in the order of 1-2dB above the outdoor threshold at 63Hz and 80Hz.

The modelled exceedances are modest and have been identified as being primarily associated with trucks travelling along the site access route in combination with the existing secondary crushing and screening plant and sales loader operations.

The secondary crushing and screening equipment is not changing, so the resultant levels at receptor locations will also not be changing and will have been a part of the quarry operation for several decades.

With the proposed relocation of the primary crushing plant, if anything the noise impacts at the critical receptors are expected to be reduced relative to current impacts.

Further to the above, with the implementation of the truck driver education program and noise management plan, it is expected that the operator will be maintaining their general environmental duty to minimise potential impacts so far as reasonably practicable.

12. Proposed Noise Control Strategies

12.1. Operating Hours

The results of the noise model indicate that site operations must be generally limited to the EPA defined day period between 7:00am and 6:00pm Monday to Saturday. During the early morning period between 6:30am and 7:00am, the site can operate at reduced capacity including the loading of the two 'on-site' trucks which remain at site overnight.

Should the loader or trucks be required to 'warm up' during the early morning, this should be done at a location not less than 400m to the east of the current crushing plant location. Trucks must not use the access road prior to 7:00am.

12.2. Reverse Beepers

Conventional reversing beepers have the potential to cause annoyance to residents and contribute to exceedance of noise limits residential locations around the site, due to the highly distinctive character and on-off nature of the noise.

In consideration of the above, all mobile equipment operating at the site should be fitted with broadband safety alarms which vary their noise output according to the ambient noise level. These reversing alarms should be selected for the lowest noise level consistent with safe operation. Suitability of the system will need to be certified by others. EPA Publication 1890 'Managing noise from reversing alarms' provides further information regarding these units.

12.3. Relocation of Primary Crushing Plant

The client has advised that the primary crushing plant will be relocated to be in the order of 400m to the northeast of the current location hence reducing noise emissions from the plant in the direction of sensitive receptors located to the southwest of the subject site.

12.4. Sales Truck Movements

A key finding of the assessment was the significance of noise due to truck movements along the access road. Based on the outcomes of the assessment, WMG has determined the following:

- No trucks to use the access road prior to 7:00am.
- Any trucks waiting to access the site at 7:00am must not sit idle in proximity to the site.
- Trucks must not use engine brakes on access road.
- Trucks should maintain a slow constant speed to minimise engine noise.

WMG would recommend that the above concepts form part of the subject site noise management plan which includes educating trucks drivers.

12.5. General Noise Control Strategies

General noise control strategies which can be implemented by operations coordinators should include:

- Stockpiles and travel routes within the site should be configured to minimise any need for trucks to reverse.
- Equipment operators must be educated regarding minimising their noise emissions where reasonably practicable during required tasks. This will include ensuring that emptying trays is done in a manner which minimises noise emissions. Specific care should be taken to minimise noise emissions from these events including slower tipping techniques when in proximity to critical sensitive receptors.

It is envisaged that these items will form part of the site noise management plan.

12.6. Noise Management Plan

The client has advised that a noise management plan will be prepared for the site which will summarise the ongoing noise control requirements and commit to minimising noise emissions from the site so far as reasonably practicable.

The noise management plan will include the following:

- Requirements in relation to operating hours and associated activities.
- Commitment to education of truck drivers whilst on site, when using the site access road, and when travelling on nearby roads.
- Commitment to replacement of any tonal safety alarms with non-tonal broadband safety alarms.
- Evaluation of available mobile equipment (sales wheel loader, excavators, water cart etc), and selection of mobile equipment with sound power levels as low as reasonably practicable when replacing equipment.

Further to the above, the client has advised that further noise monitoring will be undertaken in order to verify that the amended site operations including the relocation of the primary crushing plant adequately controls noise impacts at the nearest sensitive receptors.

12.7. General Environmental Duty – General Requirements

In accordance with the requirements of The Act, the client would be deemed to be in breach of the GED if they fail to do any of the following in the course of conducting the business or the undertaking so far as reasonably practicable:

- use and maintain plant, equipment, processes and systems in a manner that minimises risks of harm to human health and the environment from pollution and waste;
- use and maintain systems for identification, assessment and control of risks of harm to human health and the environment from pollution and waste that may arise in connection with the activity, and for the evaluation of the effectiveness of controls;
- use and maintain adequate systems to ensure that if a risk of harm to human health or the environment from pollution or waste were to eventuate, its harmful effects would be minimised;
- ensure that all substances are handled, stored, used or transported in a manner that minimises risks of harm to human health and the environment from pollution and waste;
- provide information, instruction, supervision and training to any person engaging in the activity to enable those persons to comply with the general environmental duty.

The described items will likely be internal processes involving training and documentation to address any potential emissions from the site in the event that they occur.

13. Conclusion

WMG has carried out an assessment to address potential noise emissions from the existing operations and proposed expansion of the extraction area at the hard rock quarry located at 130 McMahons Road, Launching Place.

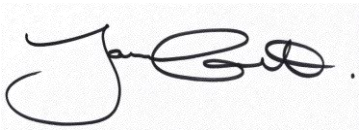
The assessment has included the following:

- Attended noise measurements at the subject site to consider the existing acoustic environment and derive source sound power levels for existing equipment operating at the site.
- Modelling of potential noise emissions from the proposed use at sensitive receptors during the future expansion of the subject site during the critical early stages (stages 1 and 2) when mobile excavation plant will be operating at surface level.

Based on the results of the assessment, WMG has concluded that noise mitigation strategies will be required in order to reduce current noise emissions from the site to comply with Noise Protocol noise limits at residential receptors.

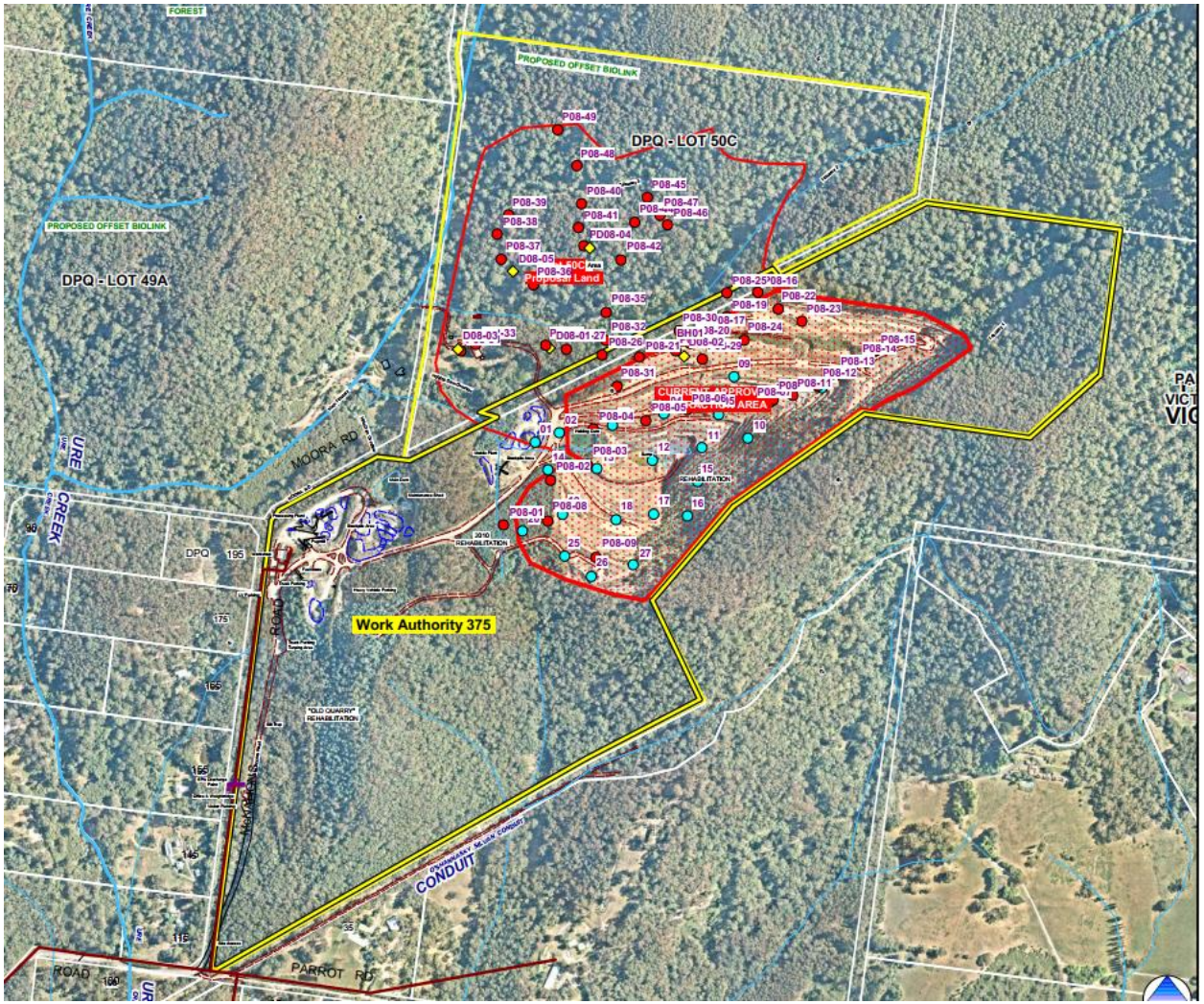
These strategies will include the following:

- Limitations regarding use of the access road prior to 7:00am.
- Limitations on operating times to the EPA defined day period.
- Replacement of any tonal reversing safety alarms with broadband noise alternatives.
- Relocation of primary crushing plant to increase noise shielding to the southwest.
- Evaluation of available mobile equipment (sales wheel loader, excavators, water cart etc), and selection of mobile equipment with sound power levels as low as reasonably practicable when replacing equipment.
- Preparation of a noise management plan which will reference the above, and include the requirement for further noise monitoring once the primary crushing plant has been relocated.

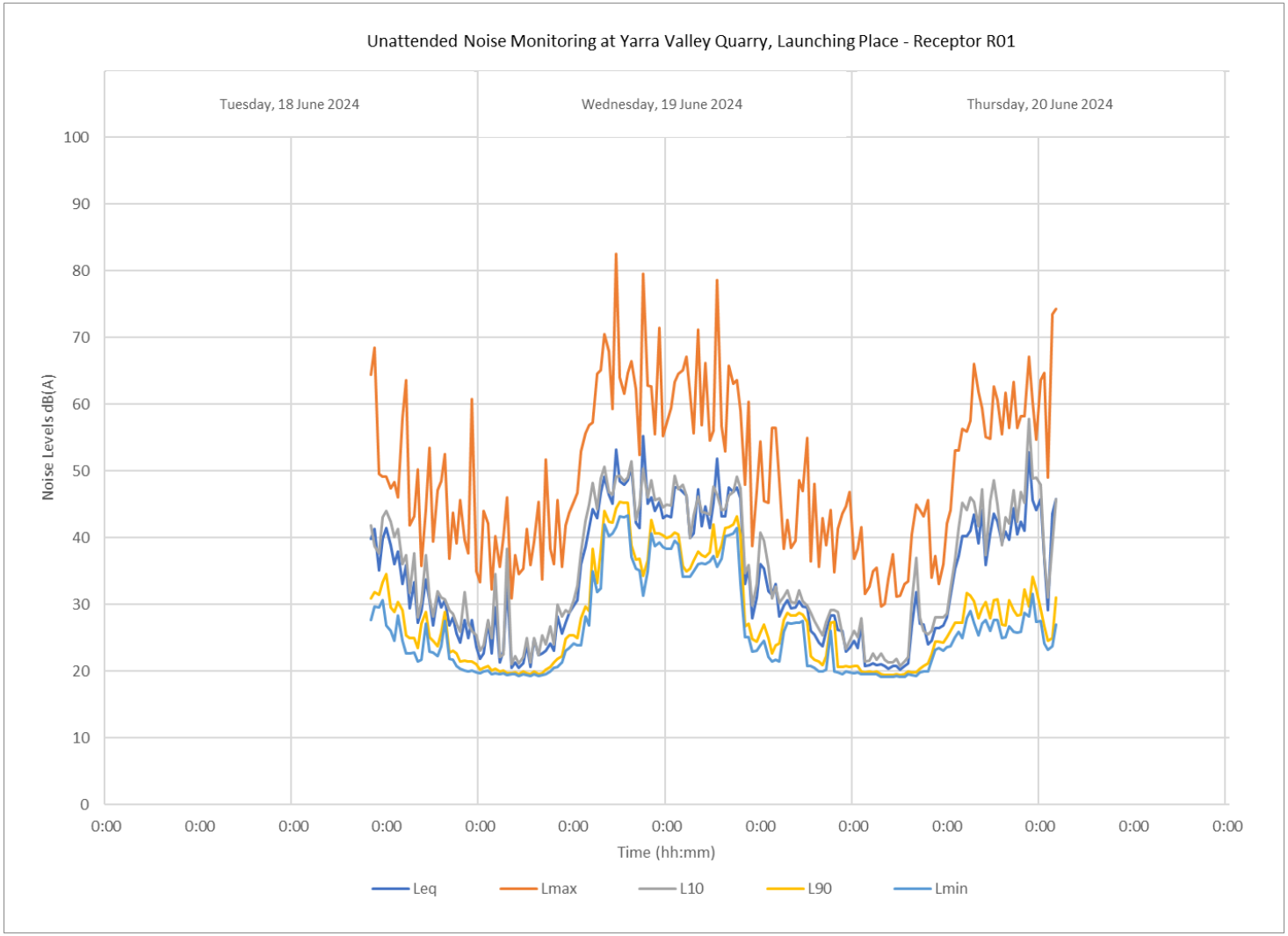


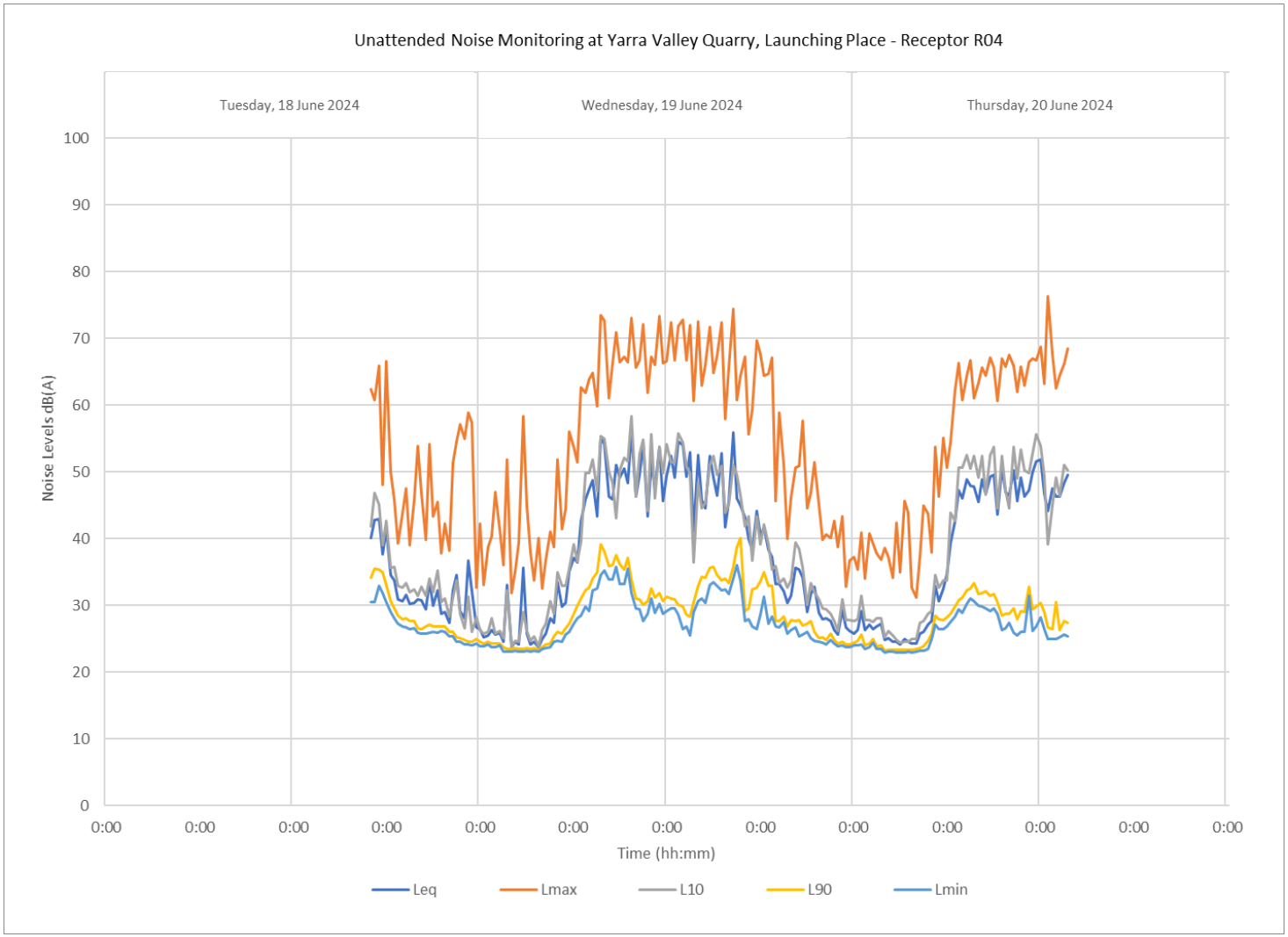
JORDAN GROWCOTT
WATSON MOSS GROWCOTT
ACOUSTICS PTY LTD

Appendix 1 – Site boundaries including proposed expansion area



Appendix 2 – Unattended Noise Monitoring Results




Unattended Noise Monitoring at Yarra Valley Quarry, Launching Place - Receptor R04
Tuesday, 18 June 2024
Wednesday, 19 June 2024
Thursday, 20 June 2024
Noise Levels dB(A)
100
90
80
70
60
50
40
30
20
10
0
0:00
Time (hh:mm)
Leq
Lmax
L10
L90
Lmin