Mulga Downs Iron Ore Mine

Hancock Prospecting Pty Ltd

Noise and Vibration Desktop Assessment

151389 | 54533

24 April 2023

We acknowledge the Traditional Custodians of Country throughout Australia and their connections to land, sea and community.

We pay respect to Elders past and present and in the spirit of reconciliation, we commit to working together for our shared future.

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Abbreviations

Term	Definition
dB	Decibel
dB(A)	A-weighted decibel. An expression of the relatively loudness of sound as perceived by the human ear.
HPPL	Handcock Prospecting Pty Ltd
IF	Influencing factor
kg	Kilogram
km	Kilometres
L_{A1}	A noise level which is not to be exceeded for more than 1% of the time.
L_{A10}	A noise level which is not to be exceeded for more than 10% of the time
L_{Aeq}	Equivalent Continuous Sound Pressure Level
L_{AFast}	Obtained using the A frequency weighting and the F time weighting as specified in AS1259.1--1990
L_{Amax}	A noise level which is not to be exceeded at any time
L_{ASlow}	Obtained using the A frequency weighting and the S time weighting as specified in AS1259.1--1990.
L_{pA}	Sound pressure level
m	Meters
MDIOM	Mulga Downs Iron Ore Mine
mm/s	Millimetres per second
ms	Millisecond
Mtpa	Million tonnes per annum
SPL	Total sound power level
The Project	Mulga Downs Iron Ore Mine
The Regulations	Environmental Protection (Noise) Regulations 1997

Executive Summary

Handcock Prospecting Pty Ltd is proposing to develop the Mulga Downs Iron Ore Mine, which is located approximately 210 kilometres south of Port Hedland and 180 km northwest of Newman in the Pilbara Region of Western Australia. The MDIOM includes the development of the new iron ore mine, associated borefield and processing infrastructure for supply of iron ore product to HPPL customers.

Operational and blasting noise and ground-borne vibration levels were predicted using the QGIS Plugin "NoisePrediction" (Htet Arkar Soe, 2022) and Australian Standard calculations (Australian Standard, 2006) of the Proposal has been undertaken to determine potential noise impacts of mining operations on the surrounding community (i.e. sensitive receivers).

The aim of this assessment is to quantify the potential noise and vibration impacts from the proposed MDIOM operations from analysis of the Project ambient noise monitoring programs and relevant publicly available noise assessments, to determine if the operations are likely to comply with the *Environmental Protection (Noise) Regulations 1997*.

The results are provided in Table 4 1, they indicate that measure may be required to mitigate noise levels at the Wirrilimurra Aboriginal Community and the Youngaleena Aboriginal Community.

The predicted peak blast noise and ground-borne vibration levels are predicted to be compliant at all noise sensitive receivers and therefore are considered to not require mitigation.

The information and results provided within this report are considered sufficient to inform risk assessments and the development of mitigation strategies for all phases of the MDIOM.

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1. Introduction

JBS&G has been engaged by Hancock Prospecting Pty Ltd (HPPL) to undertake a desktop environmental noise and vibration assessment for the Mulga Downs Iron Ore Mine (MDIOM, the Project).

1.1 Aim

The aim of this assessment is to quantify the potential noise and vibration impacts from the proposed MDIOM operations from analysis of the Project ambient noise monitoring programs and relevant publicly available noise assessments, to determine if the operations are likely to comply with the *Environmental Protection (Noise) Regulations 1997* (the Regulations).

1.2 Scope

This report considers the following:

- The existing environment (Section 2)
- Noise and vibration assessment criteria (Section 3)
- Predicted outcomes for the MDIOM from this assessment (Section 4).

1.3 Project Overview

HPPL is proposing to develop the MDIOM, which is located approximately 210 kilometres (km) south of Port Hedland and 180 km northwest of Newman in the Pilbara Region of Western Australia (Figure 1-1). The MDIOM includes the development of the new iron ore mine, associated borefield and processing infrastructure for supply of iron ore product to HPPL customers.

Construction activities will involve clearing of vegetation required for the construction and development of mine pits and associated infrastructure. Site operation and activities over the life of the mine include, continual mining of open pits including blasting, processing operations and ore loading and hauling.

The MDIOM is anticipated to produce up to 20 million tonnes per annum (Mtpa) of iron ore with an operational life of approximately 30 years. The mine will be in operation 24 hours a day, 7 days a week.

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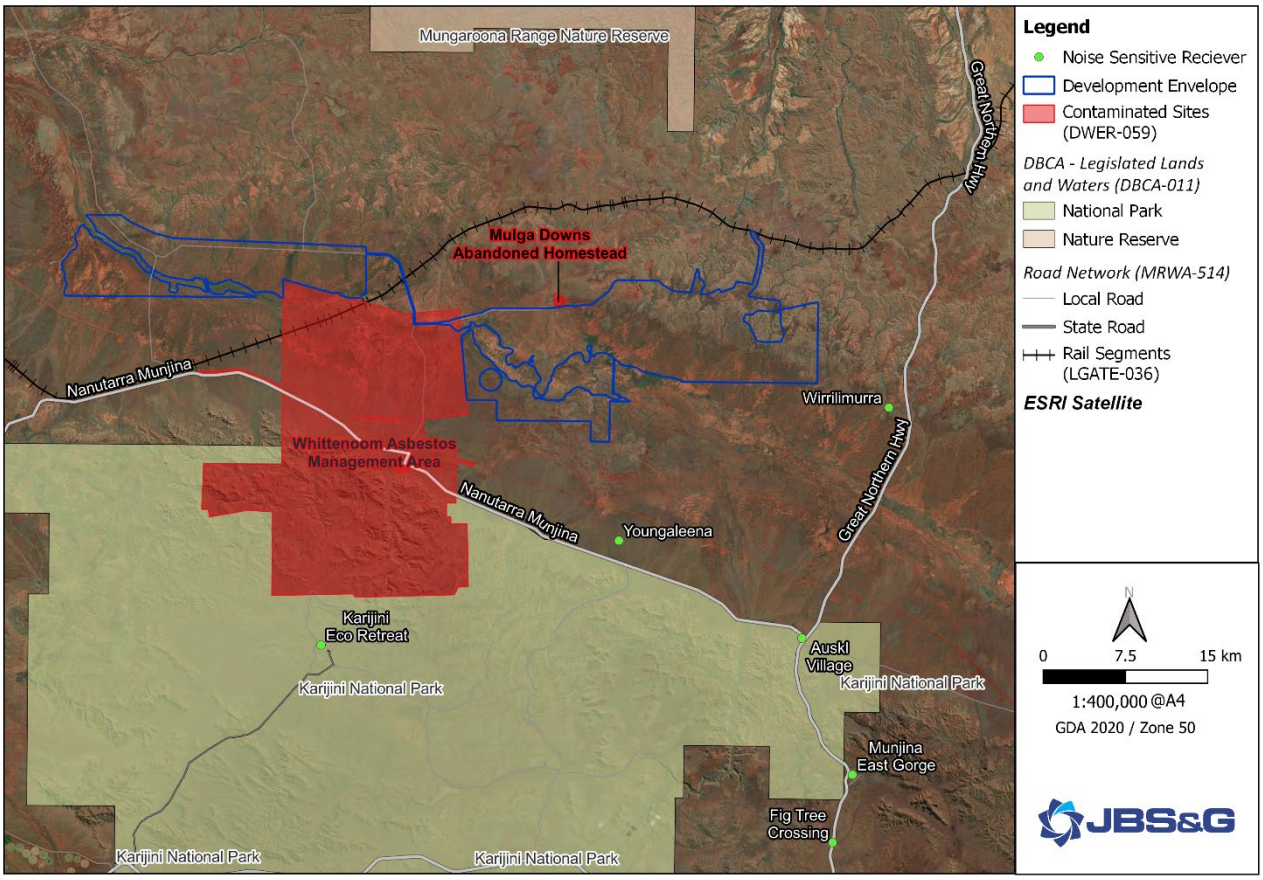

Figure 1-1 Mulga Downs Iron Ore Mine Location

2. Existing Environment

2.1 Existing Ambient Acoustical Environment

Unattended background noise monitoring was conducted between May 2019 to February 2021 at two representative locations around the Project area to provide an indication of the existing noise environment before any earthworks / construction activities commenced (SLR, 2021).

The noise monitors were deployed in accordance with AS1055 (Australian Standard, 2018) at a height of 1.5 m above ground, with power supplied from a connected solar panel and weather protected heavy duty battery. The noise monitors have a workstation emission sound pressure level (L_{pA}) of 16 decibel (dB). The noise monitors were protected from disturbance through the use of temporary fencing.

One noise monitor (Noise_A) was positioned in the central section of the MDIOM, whilst the other noise monitor (Noise_B) was positioned in the eastern section (Figure 2-1).

The data obtained during the baseline monitoring program (SLR, 2021) indicated the following key outcomes:

- Key contributors to ambient sound levels are prevailing winds, distant road traffic (e.g., Great Northern Highway) and local fauna (insects).
- Ambient noise levels (as described by the median 15-minute L_{Aeq} value) broadly increase in the warmer months of the year as follows:
  - From December to March inclusive, L_{Aeq} 30-35 dB at night increasing to 35-40 dB during the day.
  - From April to November inclusive, L_{Aeq} < 20 dB at night increasing to 33-38 dB during the day.

- During high wind conditions, the data **s**uggests that ambient sound levels would often exceed the night time Assigned Noise Level of L_{A10} 35 dB.
- Noise_A recorded higher night and evening noise levels than Noise_B - this was attributed to its closer proximity (20 km) to the East Camp.

Overall, ambient sound levels were a consequence of ambient weather conditions, distant road traffic and local fauna. Ambient sound levels often exceeded night time Assigned Noise Levels under specific weather conditions such as high wind and/or heavy rain.

2.2 Sensitive Receivers

A review of publicly available and client provided spatial data was used to determine the presence of noise sensitive receivers (WA Government, 1997) located around the proposed Development Envelope (Figure 2-1 and Table 2-1).

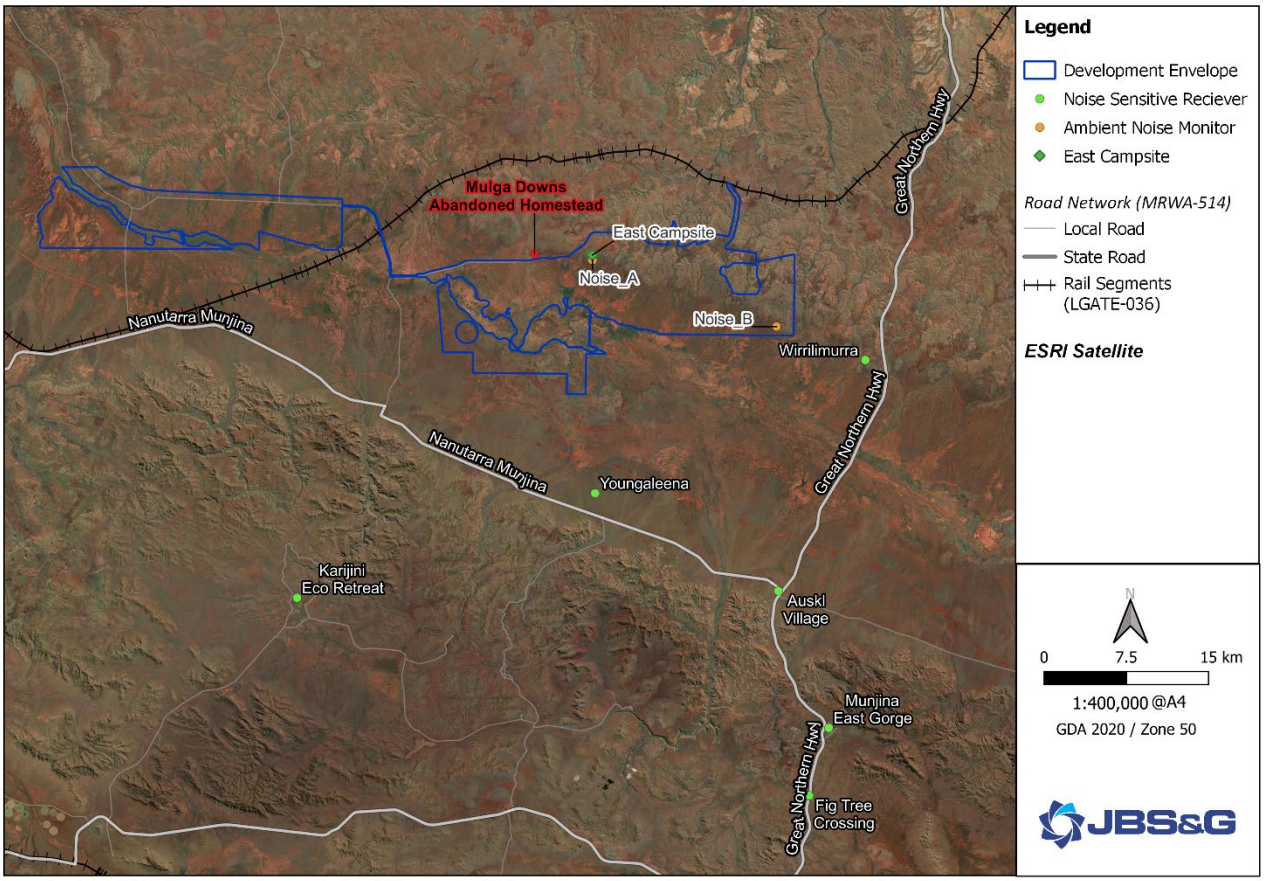

Figure 2-1 Locations of known Noise Sensitive Receivers and Noise Monitors

2.3 Noise Sources

Three locations were identified as noise hubs. Noise hubs, for the purpose of this assessment have been defined as the centre point of nearest proposed pit to a noise sensitive receiver.

The predictions were made using the QGIS Plugin "NoisePrediction" (Htet Arkar Soe, 2022). The plugin estimates noise level by distance and barriers prediction. The Plugin was run with the following parameters to imitate worse-case scenario noise levels.

- Total Sound Power Level (SPL) level of all equipment in Table 2-2 running simultaneously.
- Project activity: 24 hours per day.
- Activity operation: 24 hours per day.

- Noise source height: 4 m above ground level.
  - Representative of approximate Haul Pac engine height.
- Ground type: 25% soft ground:75% hard ground.
  - Soft Ground: the ground can absorb noise level (e.g. agricultural land, grassland, shrub land, plantation, etc.).
  - Hard Ground: the ground cannot absorb noise level (e.g. surface water, concrete places, paved road, etc.).

The distance between the noise hubs and noise sensitive receivers is provided in Table 2-1.

Table 2-1 Known Sensitive Noise Receivers

Receiver	Distance from Nearest Noise Hub
Wirrilimarra - Aboriginal Community	9.3 km (Hub 1)
Youngaleena - Aboriginal Community	17 km (Hub 3)
Auski Village - Roadhouse	24 km (Hub 2)
Karijini Eco Retreat – Recreation Site	37 km (Hub 3)
Munjina East Gorge - Lookout	37 km (Hub 2)
Fig Tree Crossing – Lookout	43 km (Hub 2)

A list of fixed and mobile mining equipment was provided by HPPL. This list was used to identify relevant SPLs from measurements made of equivalent equipment operated at other iron ore mine sites (Table 2-2).

The total logarithmic SPL data for the fleet listed in Table 2-2 were utilised as inputs for the calculations, with 100% utilisation of the individual plant in-situ assumed for the calculations and mapping. This is a conservative approach since it is unlikely this scenario would occur on site.

Table 2-2 Equipment Noise Sources

Equipment Details	Quantity	Sound Power Level (Mid-point) dB(A)*
Drills	5	114
Front End Loader	3	113
Shovels / excavators	6	107
Haul trucks	40	107
Track dozers	7	110
Graders	3	110
Wheel dozers	2	108
Service trucks	3	107
Water trucks	4	107
	Total	127

*dB(A) = A-weighted decibel. An expression of the relatively loudness of sound as perceived by the human ear.

3. Assessment Criteria

This section outlines the nature of industrial noise impacts expected from mining operations, as well as the applicable noise legislative framework (Table 3-1).

Environmental noise management is regulated in Western Australia through the Environmental Protection (noise) Regulations 1997 (the Regulations), which operates under the *Environmental Protection Act 1986*. The Regulations specify maximum noise levels that are allowable at noise-sensitive premises, commercial premises and industrial premises, to which assigned noise levels are set accordingly.

Table 3-1 Noise and Vibration Assessment Framework

Aspect	Source	Statutory / Government Policy	Australian / International Standards
Construction Noise	Airblast overpressure from blasting	Environmental Protection (noise) Regulations 1997 (WA Government, 1997)	ANZEC guidelines (ANZEC, 1990)
	Construction plant activities within site		AS2107:2016 (ANZEC, 2016)
Construction Vibration	Ground-borne vibration (GBV) from blasting	-	ANZEC guidelines (ANZEC, 1990)
	Vibration from construction activities	-	AS/ISO 2631.2:2014 (AS/ISO, 2014) BS 6472:2008 (BSI, 2008)
Operational environmental noise	Airborne noise from rail operations	SPP5.4 (DPLH, 2019)	No standard available
	Vehicle movement on public roads		
	Mining activities Mechanical ventilation plant On site power generation Blasting	Environmental Protection (noise) Regulations 1997 EPA Guidance (EPA, 2016)	No standard available
Operational vibration	Ground-borne vibration (GBV) from mining operations	-	ANZEC Guidelines (ANZEC, 2016)
	Ground-borne vibration (GBV) from rail operations	-	AS/ISO 2631.2:2014 (AS/ISO, 2014) BS 6472:2008 (BSI, 2008) ISO 14837 (AS/ISO, 2005)

3.1 Operational Noise

Noise emissions from mining operations are covered by the Regulations. Generally, to achieve compliance with the Regulations, the noise levels at nearby sensitive premises are not to exceed defined limits known as Assigned Noise Levels, or simply, assigned levels. A summary of the applicable noise limits is provided in Table 3-2. The Regulations adopt three noise metrics to quantify the noise limits, in particular:

- L_{Amax} signifies a noise level which is not to be exceeded at any time.
- L_{A1} signifies a noise level which is not to be exceeded for more than 1% of the time.
- L_{A10} signifies a noise level which is not to be exceeded for more than 10% of the time.

The assigned levels are determined from consideration of prevailing background noise levels and 'influencing factors' (IFs) that consider the level of commercial and industrial zoning in the locality. The influencing factor takes into account zoning and road traffic around each noise sensitive receiver of interest, within a 100 m and 450 m radius.

Under the Regulations, if noise emitted from any premises, when received at any other premises, cannot reasonably be free of intrusive characteristics of tonality, modulation and impulsiveness, then a series of adjustments are added to the emitted levels (measured or calculated) and the adjusted level must comply with the assigned level. These adjustments are detailed in Table 3-3 and are further defined in Regulation 9(1) of the Regulations.

Table 3-2 Assigned Noise Levels Summary

Part of Premises receiving noise	Time of day	Assigned level dB(A)		
		L_{A10}	L_{A1}	L_{max}
Noise sensitive premises: highly sensitive area	07:00 to 19:00 hours Monday to Saturday	45 dB(A) + Influencing Factor	55 dB(A) + Influencing Factor	65 dB(A) + Influencing Factor
	09:00 to 19:00 hours Sundays and public holidays	40 dB(A) + Influencing Factor	50 dB(A) + Influencing Factor	65 dB(A) + Influencing Factor
	19:00 to 22:00 hours all days	40 dB(A) + Influencing Factor	50 dB(A) + Influencing Factor	55 dB(A) + Influencing Factor
	22:00 hours on any day to 07:00 hours Monday to Saturday and 09:00 hours Sunday and public holidays	35 dB(A) + Influencing Factor	45 dB(A) + Influencing Factor	55 dB(A) + Influencing Factor
Noise sensitive premises: any other area than highly sensitive area.	All hours	60 dB(A)	75 dB(A)	80 dB(A)
Commercial premises	All hours	60 dB(A)	75 dB(A)	80 dB(A)
Industrial and utility premises	All hours	65 dB(A)	80 dB(A)	90 dB(A)

Received noise levels are subject to adjustments if the noise exhibits intrusive or dominant characteristics i.e., if the noise is impulsive, tonal or modulating, known as an influencing factor. These adjustments (Table 3-3) are added to the item of equipment emitting the specific noise characteristic and are cumulative up to a maximum of 15 dB. Per item.

Table 3-3 Definition of Noise Characteristics (IF)

Noise characteristic	Definition	Adjustment if present*
Tone	Where the difference between the A weighted sound pressure level in any one third octave ban and the arithmetic average of the A weighted sound pressure levels in the two adjacent one third octave bands is greater than 3 dB in terms of $L_{Aeq,T}$ where the time period T is greater than 10% of the representative assessment period, or greater than 8 dB at any time when the sound pressure levels are determined as L_{ASlow} levels.	+5 dB
Modulation	A variation in the emission of noise that – • Is more than 3 dB L_{AFast} or is more than 3 dB L_{AFast} in any one third octave band; • Is present for at least 10% of the representative assessment period; and, • Is regular, cyclic and audible.	+5 dB
Impulsiveness	Present where the difference between the L_{APeak} and L_{Amax} is more than 15 dB when determined for single representative event.	+10 dB

*Where noise emission is not music, these adjustments are cumulative to a maximum of 15 dB.

3.2 Blasting

Blasting is an irregular mining activity that creates high instantaneous noise and vibration levels at the source, and as such the Regulations define different noise criteria than for continuous and semi-continuous sources as discussed above.

Table 3-4 outlines the blast noise limits defined in the Regulations.

Table 3-4 Blast Noise Restrictions

Time period	Noise limit dB Linear Peak	Applicable to
Day-time (7 am to 6 pm), except Sundays and public holidays	125	Any blast
Day-time (7 am to 6 pm), except Sundays and public holidays	120	9 in 10 consecutive blasts
Sundays & Public Holidays (7 am to 6 pm)	120	Any blast
Sundays & Public Holidays (7 am to 6 pm)	115	9 in 10 consecutive blasts
Night-time (6 pm to 7 am) on any day	90	Any blast

A desktop assessment has been undertaken to predict the potential noise and vibration levels from Blasting within the Development Envelope, and on the surrounding receivers.

Table 3-5 presents the blast parameters used to undertake the blasting noise and vibration assessment, which have been provided by HPPL.

The most significant parameter for blast noise and vibration emissions is weight of explosives per hole. The assessment assumes a maximum instantaneous charge of 1 hole at 560 kg of explosive per hole for 5 m benches, with a detonation delay of ≥ 1 millisecond (ms).

Table 3-5 Blast Parameters

Parameter	Typical Blast Parameters
Explosive per hole	560 kg
Instantaneous detonation	1 hole
Depth	13.8 m
Hole Diameter	251 mm
Emulsion	60:40 Emulsion: ANFO

The peak noise level from blasting has been predicted using the following empirical formula described in Appendix J7.2 of Australian Standard AS2187.2 *Explosives – Storage and Use* (Australian Standard, 2006);

$$P=K(R/Q_{1/3})a$$

where;

- P is pressure, in kilopascals
- Q is the explosives charge mass, in kilograms
- R is the distance from charge, in metres
- K is the site constant
- a is the site exponent.

Australian Standard AS2187.2 recommends site constant values in the range of 10 to 100 for confined blast-hole charges. The AS2187.2 recommended site constant value of 55 and recommended site exponent value of -1.45 has been adopted.

3.3 Ground-Borne Vibration Limits

Ground-borne vibration impacts from blasting have been assessed using acceptable levels defined in Australian Standard AS2187.2. The types of impacts associated with this ground-borne vibration have been categorised as follows:

- Structural damage to buildings.
- Disturbance (i.e., to people sleeping).

The accepted vibration parameter for blasting is ground-borne particle velocity at the receiver in millimetres per second (mm/s). Table 3-6presents the vibration levels defined in Appendix J of AS 2187.2.

Ground-borne vibration from blasting has the potential to cause sleep disturbance with the associated potential for fatigue during subsequent work hours. As such it can be considered a safety concern for employees residing at camps that may be exposed to vibration impacts. Blasting is limited to day-time hours and therefore its impacts are expected to be limited to night shift workers sleeping during day-time hours. The human comfort vibration level, according to AS2187.2 2006 is 5 mm/s (peak particle velocity).

Table 3-6 Acceptable Vibration Levels for Blasting (Australian Standard, 2006)

Receiver	Peak Particle Velocity (mm/s)
Human comfort level	5
Houses and low-rise residential buildings and commercial buildings	10
Industrial or commercial premises	25

Ground borne vibration levels have been estimated using the blast parameters provided by HPPL in Table 3-5 and the vibration prediction formula defined in AS2187.2 , which is as follows:

$$V=K(R/Q_{0.5})-B$$

Where:

- V is the ground vibration peak particle velocity in mm/s.
- R is the distance between the detonation and the receiver.
- Q is the maximum instantaneous charge in kg.
- K and B are empirical constants related to site and rock properties. Where ‘K’ refers to the site confinement conditions (i.e. free face, quarry, heavily confined blasting) and ‘B’ refers to expected rock types.

The values used for the calculation include a peak detonation of 560 kg/hole and site and rock properties for ‘average’ free field conditions defined in AS2187 of K=1140, B=1.6.

4. Assessment Results

The L_{A10} assigned noise level has been used to predict the outcome at each of the sensitive noise receivers, since this is the most applicable metric for predicting continuous industrial noise. L_{A1} and L_{Amax} are typically more associated with field measurements of sporadic noise events occurring under normal operating conditions. The L_{A10} assigned noise level for 22:00 hours on any day to 07:00 hours Monday to Saturday and 09:00 hours Sunday and public holidays time of day was chosen to allow assessment against worst case scenario.

The predicted noise level and blasting peak particle velocity at each sensitive receiver are provided in Table 4-1 and are depicted in Figure 4-1, Figure 4-2 and Figure 4-3.

Table 4-1 Predicted Noise Level at each Sensitive Noise Receiver

Receiver	Assigned Noise Level dB (L_{A10})	Predicted Noise Level dB(A) Hub 1	Predicted Noise Level dB(A) Hub 2	Predicted Noise Level dB(A) Hub 3	Predicted Peak Blast Noise (dB) Hub 1	Predicted Peak Blast Noise (dB) Hub 2	Predicted Peak Blast Noise (dB) Hub 3	Predicted Blast Vibration mm/s Hub 1	Predicted Blast Vibration mm/s Hub 2	Predicted Blast Vibration mm/s Hub 3
Wirrilimurra Aboriginal Community	35	42	41	28	100	99	82	0.1	0.1	<0.1
Youngaleena Aboriginal Community	35	31	37	37	92	90	93	<0.1	<0.1	<0.1
Auski Village Roadhouse	60	30	36	26	88	88	86	<0.1	<0.1	<0.1
Karijini Eco Retreat	60	22	23	26	79	80	82	<0.1	<0.1	<0.1
Munjina East Gorge Lookout	60	25	26	23	82	83	81	<0.1	<0.1	<0.1
Fig Tree Crossing Lookout	60	24	24	22	81	81	80	<0.1	<0.1	<0.1

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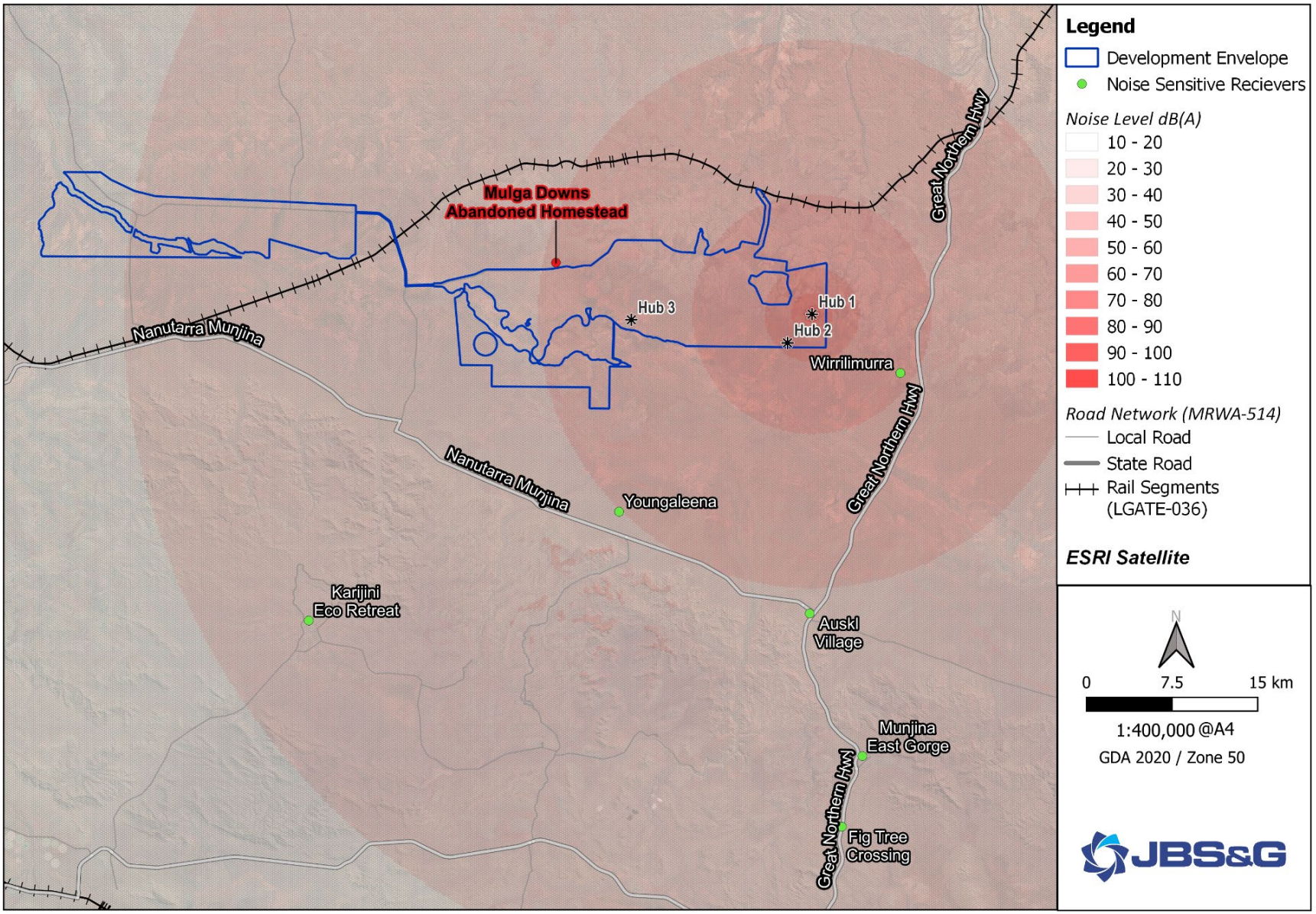

Figure 4-1 Noise Hub 1: Predicted Noise Wirrilimurra

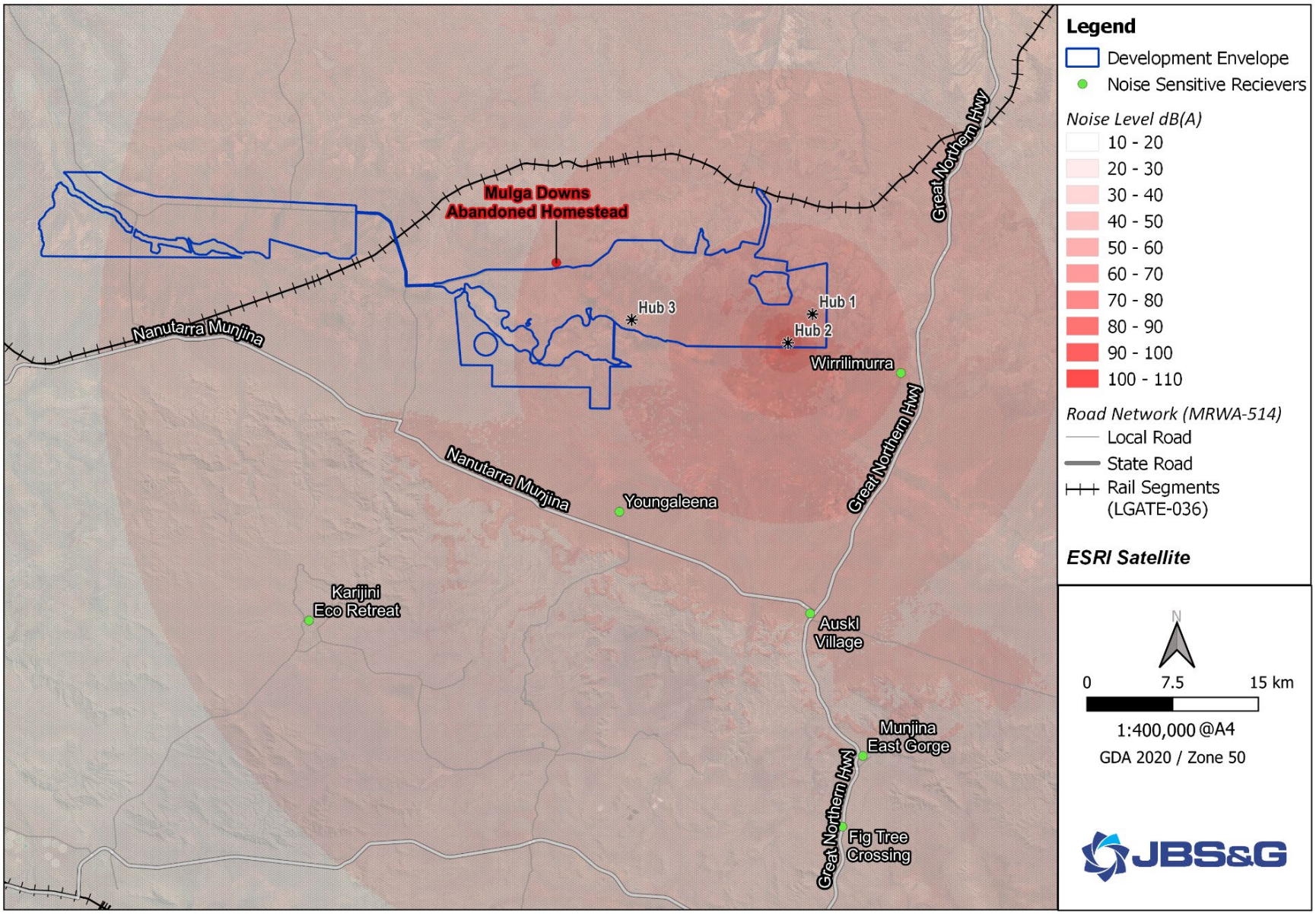

Figure 4-2 Noise Hub 2: Predicted Noise Auski Village

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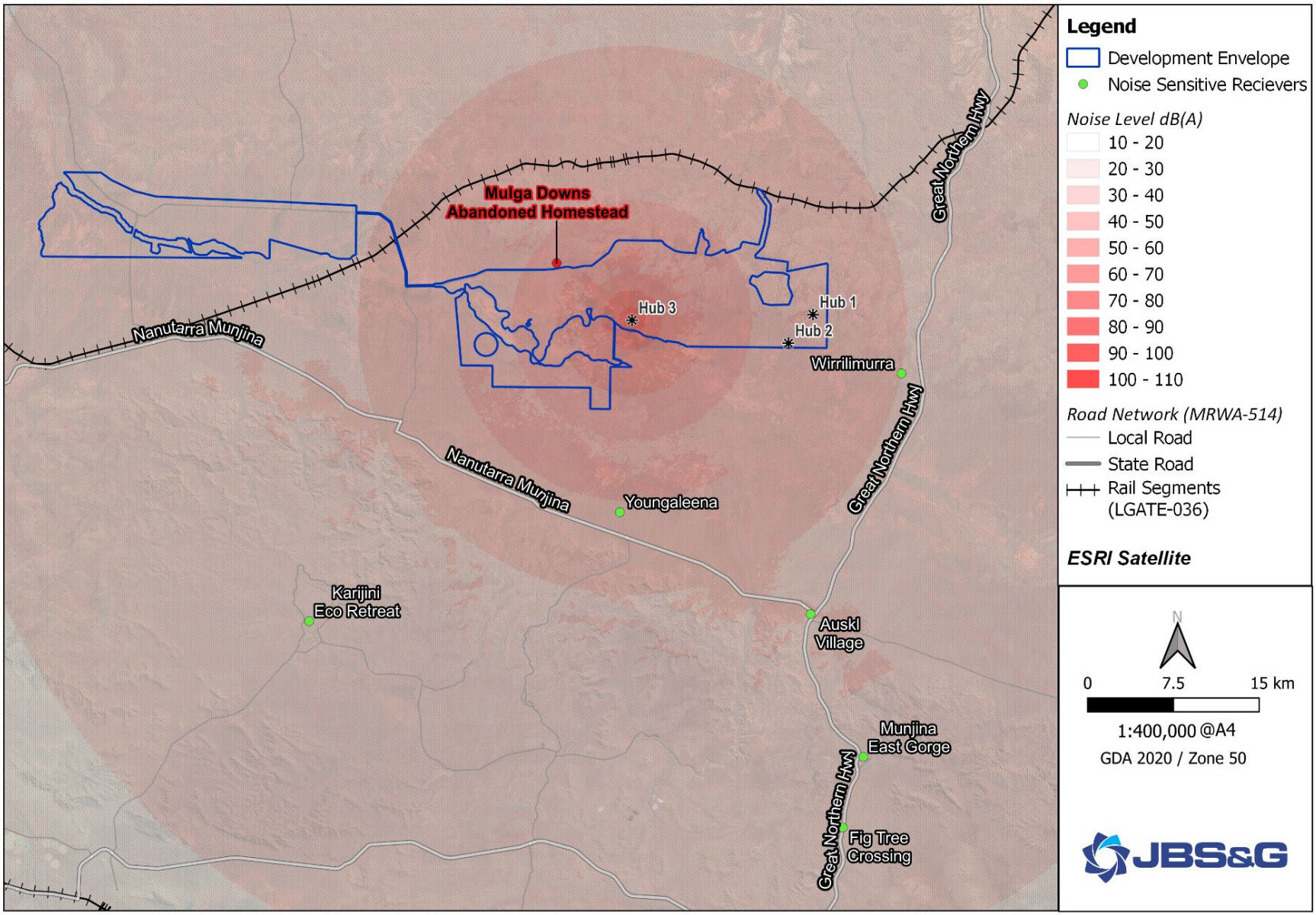

Figure 4-3 Noise Hub 3: Predicted Noise Youngaleena

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5. Conclusions and Recommendations

A high-level noise prediction was undertaken against worst-case scenario inputs in the QGIS plugin Noise Prediction for MDIOM, to estimate noise levels from mining activities on the surrounding noise sensitive receivers. Peak blast noise and ground-borne vibration limits were also predicted through Australian Standard calculations (AS/ISO, 2005; AS/ISO, 2005) to predict potential impacts at the identified noise sensitive receptors.

The results provided in Table 4-1 indicate the following noise sensitive receivers assessed under worst-case scenario conditions are non-compliant with the Regulations at:

- Noise hub 1 and 2 at the Wirrilimurra Aboriginal Community.
  - During 22:00 hours on any day to 07:00 hours Monday to Saturday and 09:00 hours Sunday and public holidays.
  - 19:00 to 22:00 hours all days.
  - 09:00 to 19:00 hours Sundays and public holidays.
- Noise hub 2 and 3 at the Youngaleena Aboriginal Community.
  - 22:00 hours on any day to 07:00 hours Monday to Saturday and 09:00 hours Sunday and public holidays.

Predicted noise levels at all other identified sensitive noise receivers are predicted to be at all assigned noise levels (Table 4-1) and therefore are considered to not require mitigation.

The predicted peak blast noise and ground-borne vibration levels are predicted to be compliant at all noise sensitive receivers and therefore are considered to not require mitigation.

The information and results provided within this report are considered sufficient to inform risk assessments and the development of mitigation strategies for all phases of the MDIOM.

6. Limitations

This report has been prepared for use by the client who has commissioned the works in accordance with the project brief only and has been based in part on information obtained from the client and other parties.

The advice herein relates only to this project and all results conclusions and recommendations made should be reviewed by a competent person with experience in environmental investigations, before being used for any other purpose.

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This report does not provide a complete assessment of the environmental status of the site, and it is limited to the scope defined herein. Should information become available regarding conditions at the site including previously unknown sources of contamination, JBS&G reserves the right to review the report in the context of the additional information.

7. References

ANZEC. (1990). *Australian and New Zealand Environment Council Technical Basis for Guidelines to Minimise Annoyance due to Blasting Overpressure and Ground Vibration.*

ANZEC. (2016). *Australian/New Zealand Standard 2107:2016 'Recommended design levels and reverberation times for building interiors.* Australian Standards.

AS/ISO. (2005). *International Standard ISO 14837-1 2005 "Mechanical vibration - Ground-borne noise and vibration arising from rail systems - Part 1: General guidance".*

AS/ISO. (2014). *AS ISO 2631.2:2014 Mechanical vibration and shock - Evaluation of human exposure to whole-body vibration - Vibration in buildings (1 Hz to 80 Hz).* Australian Standards.

Australian Standard. (2006). *AS 2187.2-2006 Explosives - Storage and Use.*

Australian Standard. (2018). *AS 1055: Acousitics - Description and Measurement of Environmental Noise.*

Bat Call WA. (2021). *A Review if Ghost Bat Ecology, Threats and Survey Requirements.* Hillarys, Western Australia: Prepared for the Department of Agriculture, Water and Environment.

BSI. (2008). *BS 6427-1:2008: Guide to Evaluation of Human Exposure to Vibratior buildings Vibration Sources and Other Blasting.* BSI Standard Publication.

DPLH. (2019). *Western Australia State Planning Policy 5.4, Road and Rail Transport Noise.* Departmant of Planning, Lands and Heritage.

EPA. (2016). *Environmental Factor Guideline: Social Surroundings.* Western Australia: Environmental Protection Authority.

HPPL. (2018). *Fibrous Minerals Management Pland Mulga Downs Project.* Handcock Prospecting Pty Ltd.

Htet Arkar Soe. (2022). QGIS Plugin - Noise Prediction Algorithm.

SLR. (2021). *Phase 2 Mulga East Iron Ore Project Noise Monitoring Program May 2019-February 2021 Technical Report.* SLR Prepared for Handcock Prospecting Pty Ltd.

WA Government. (1997). *Western Australia Environmental Protection (Noise) Regulations 1997.* Western Australian Government.

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