

Appendix J

Noise Impact
Assessment

Whitehaven Solar Farm Project

Environmental Impact Statement



WHITEHAVEN COAL

WHITEHAVEN SOLAR FARM PROJECT

NOISE IMPACT ASSESSMENT

RWDI # 2405551

9 December 2024

SUBMITTED TO

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DOCUMENT CONTROL

Version	Status	Date	Prepared By	Reviewed By
A	Draft	26 June 2024	Claire Graham-White	Roman Haverkamp
B	Draft	31 July 2024	Claire Graham-White	Roman Haverkamp
C	Final	6 September 2024	Claire Graham-White	Roman Haverkamp
D	Final	9 December 2024	Peter Thang	Roman Haverkamp

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GLOSSARY OF ACOUSTIC TERMS

Most environments are affected by environmental noise which continuously varies, largely as a result of road traffic. To describe the overall noise environment, a number of noise descriptors have been developed and these involve statistical and other analysis of the varying noise over sampling periods, typically taken as 15 minutes. These descriptors, which are demonstrated in the graph below, are here defined.

Maximum Noise Level (L_{Amax}) – The maximum noise level over a sample period is the maximum level, measured on fast response, during the sample period.

L_{A1} – The L_{A1} level is the noise level which is exceeded for 1% of the sample period. During the sample period, the noise level is below the L_{A1} level for 99% of the time.

L_{A10} – The L_{A10} level is the noise level which is exceeded for 10% of the sample period. During the sample period, the noise level is below the L_{A10} level for 90% of the time. The L_{A10} is a common noise descriptor for environmental noise and road traffic noise.

L_{A90} – The L_{A90} level is the noise level which is exceeded for 90% of the sample period. During the sample period, the noise level is below the L_{A90} level for 10% of the time. This measure is commonly referred to as the background noise level.

L_{Aeq} – The equivalent continuous sound level (L_{Aeq}) is the energy average of the varying noise over the sample period and is equivalent to the level of a constant noise which contains the same energy as the varying noise environment. This measure is also a common measure of environmental noise and road traffic noise.

ABL – The Assessment Background Level is the single figure background level representing each assessment period (daytime, evening and night time) for each day. It is determined by calculating the 10th percentile (lowest 10th percent) background level (L_{A90}) for each period.

RBL – The Rating Background Level for each period is the median value of the ABL values for the period over all of the days measured. There is therefore an RBL value for each period – daytime, evening and night time.

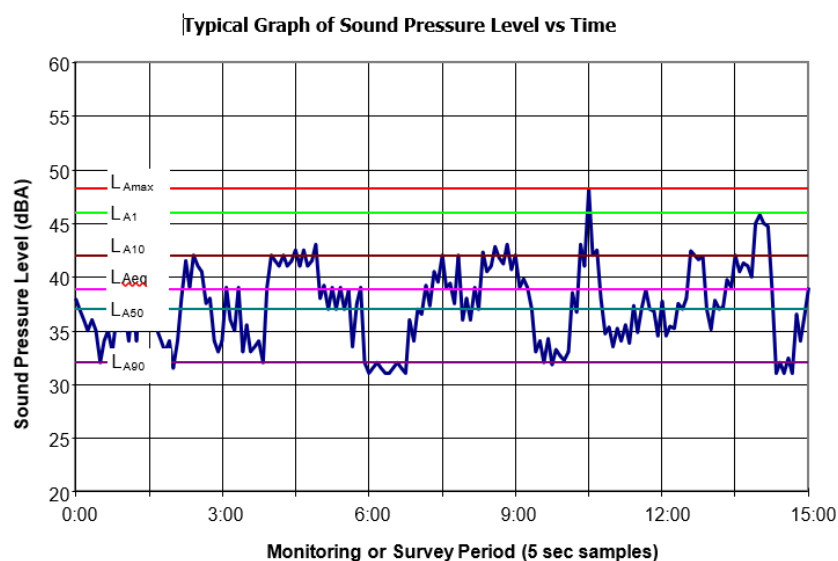




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1 INTRODUCTION

Whitehaven Energy Pty Ltd (Whitehaven) is proposing to develop a solar farm (the Project) approximately 25 kilometres (km) south-east of Narrabri and approximately 60 km north-west of Gunnedah, within the Narrabri Shire Local Government Area, in the New England North West region of New South Wales (NSW) (**Figure 1-1**).

The Project would be located adjacent to the existing Narrabri Mine on Whitehaven-managed land and would include approximately 26 megawatts (MW) direct current or 20 MW alternating current of solar electricity generation and construction of a 10 Megawatt Hour direct current Battery Energy Storage System (BESS).

RWDI Australia (RWDI) has been commissioned to prepare a Noise Impact Assessment (NIA) to evaluate operational, construction and traffic noise associated with the Project.

In accordance with the Planning Secretary's Environmental Assessment Requirements (SEARs), this review is based on the following NSW noise policies and guidelines:

- NSW Department of Environment, Climate Change & Water (2011) *NSW Road Noise Policy (RNP)*.
- NSW Department of Environment & Climate Change (2009) *Interim Construction Noise Guideline (ICNG)*.
- NSW Department of Planning & Environment (DPE) (2022) *Large-Scale Solar Energy Guideline*.
- NSW EPA (2017) *NSW Noise Policy for Industry (NPfI)*.

Blasting is not proposed for construction works associated with the Project.

Due to the nature of construction works proposed for the Project, in addition to the distance between the Project site and the nearest privately-owned residential receiver, vibration impacts from construction and operation of the Project are not expected, and have not been further discussed.

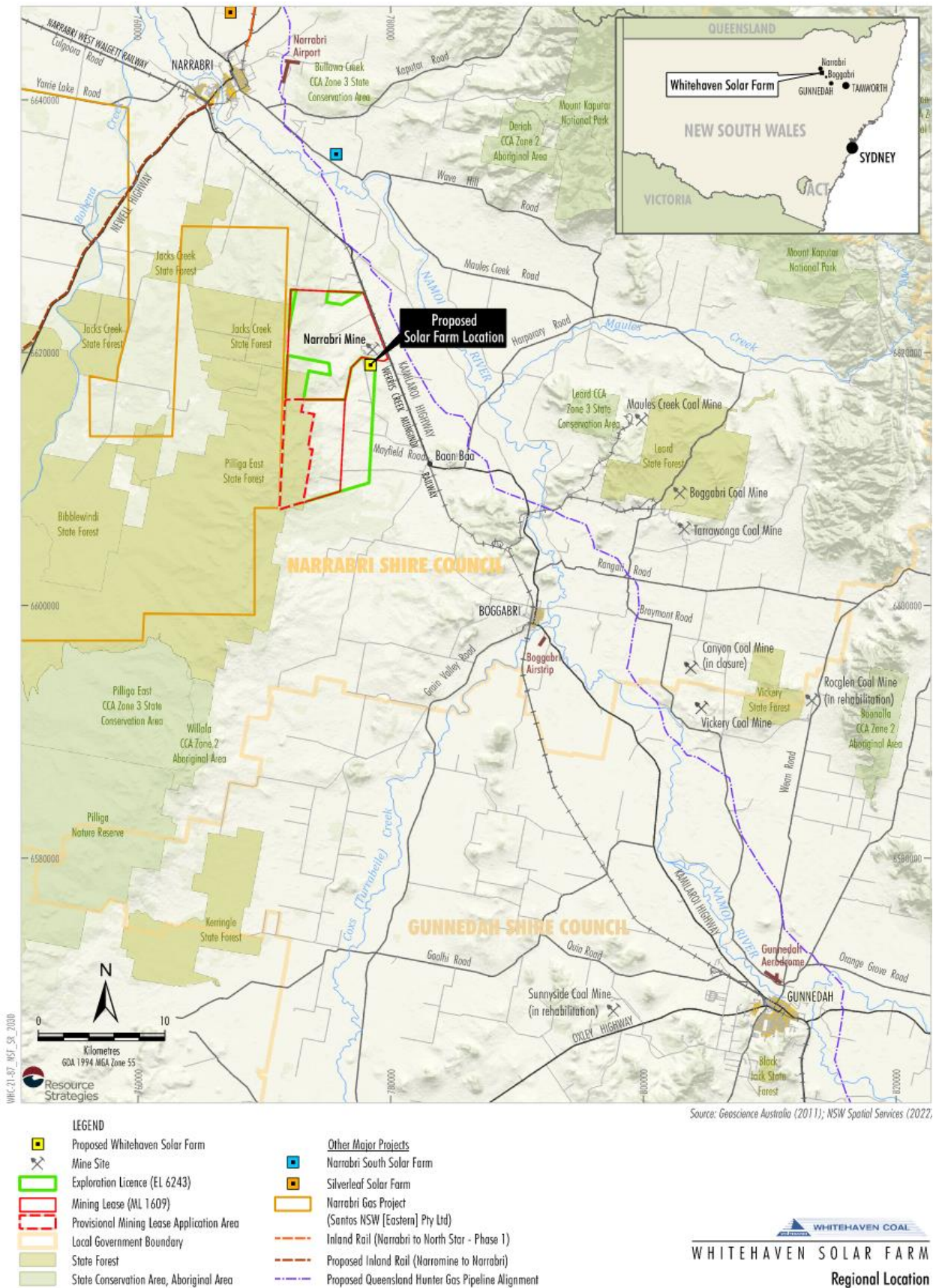


Figure 1-1 Project Location – Regional Context

2 SITE DESCRIPTION

The Project consists of a 26 MW Solar Photovoltaic (PV) Array with a 20 MW total inverter capacity and a 10 Megawatt Hour direct current BESS. It is proposed to be a grid connected, behind-the-meter system, connected to the local Essential Energy 66 kilo-volt (kV) Network. The basic Project components include, but are not limited to the following:

- construction and operation of approximately 50,000 solar photovoltaic (PV) panels to provide electricity supply for the Narrabri Mine;
- construction of a substation that facilitates connection to the existing 66 kV overhead Electricity Transmission Line (ETL);
- construction of an overhead ETL to connect the proposed substation to the existing 66 kV overhead ETL, north of Kurrajong Creek Rd;
- construction and operation of ancillary infrastructure including access roads, inverter stations, temporary staging areas, perimeter fencing and operations and maintenance buildings;
- construction and operation of a BESS;
- ongoing maintenance activities; and
- decommissioning and rehabilitation of the site.

Table 2-1 identifies the eight closest privately-owned residential receivers to the Project, which will be assessed in this NIA. The naming convention is consistent with that used for the contemporary NIA prepared for the Narrabri Mine (*Narrabri Underground Mine Stage 3 Extension Project Environmental Impact Statement – Noise and Blasting Assessment*, RWDI, 2020). **Figure 2-1** shows the locations of the eight sensitive receivers assessed by this NIA.

Table 2-2 provides a summary of the key attributes of the Project. A detailed Project layout is shown in **Figure 2-2**.

Table 2-1 Noise-Sensitive Receivers

Receiver No.	Property Name	Property Owner	Distance from Project Infrastructure (km)
669b	"Greenhills"	CH & RL MELBOURNE	3.6
670a	"Bow Hills"	JME & R STIEGER	1.5
675a	"Ardmona"	PC WEBB	0.8
676a	"Wilga"	RR MCCLUNG & EF WEBSTER	1.7
677a	-	AD & IH MOULDS	2.6
680a	"Burrigurum"	GR & L STUART	3.1
687a	"Pineview"	CS & DL KIRKBY	1.7

Table 2-2 Summary of Key Project Attributes

Project Component	Summary Description
Size and Purpose	26 MW DC, 20 MW alternating current (AC) for behind-the-meter electricity supply to the Narrabri Mine.
Project Area	Development site footprint of approximately 100 ha.
Solar Configuration	- Approximately 50,000 PV panels in a north to south alignment. - East to west tracking system (single axis).
Access Route	The proposed access route is via the Kamilaroi Highway and Kurrajong Creek Road.
Power Infrastructure	- Substation and switchyard. 66 kV connector to the existing 66 kV ETL.
BESS	10 Megawatt Hour DC. - Centralised system. - Lithium battery.
Site Entry	Site entry would be via a constructed access point on Kurrajong Creek Road.
Construction	- Construction period of approximately six to nine months. - Employment of approximately 30 personnel on average during its construction, with peak construction requiring approximately 65 personnel. - Construction undertaken during daylight hours.
Operational Life	The design operational life is approximately 50 years.
Decommissioning and Rehabilitation	Decommissioning at the end of the of Project life, involving the removal of all infrastructure with a proposed final land use to comprise a combination of native vegetation and agricultural (pasture).
Capital Investment	Approximately \$55 M.
Hours of Operation	24 hours per day with scheduled maintenance activities generally undertaken during daytime hours.

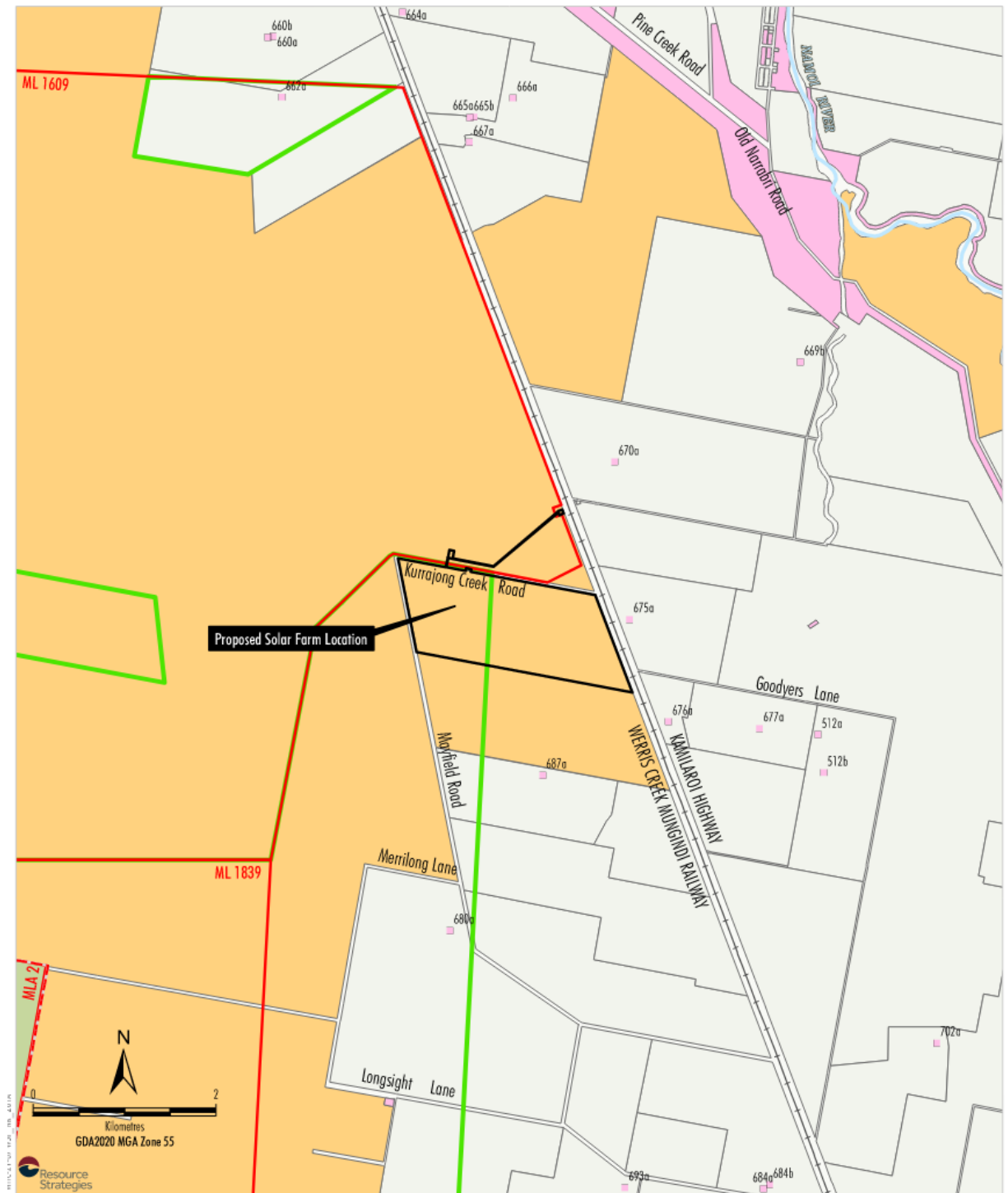


Figure 2-1 Noise-Sensitive Receivers

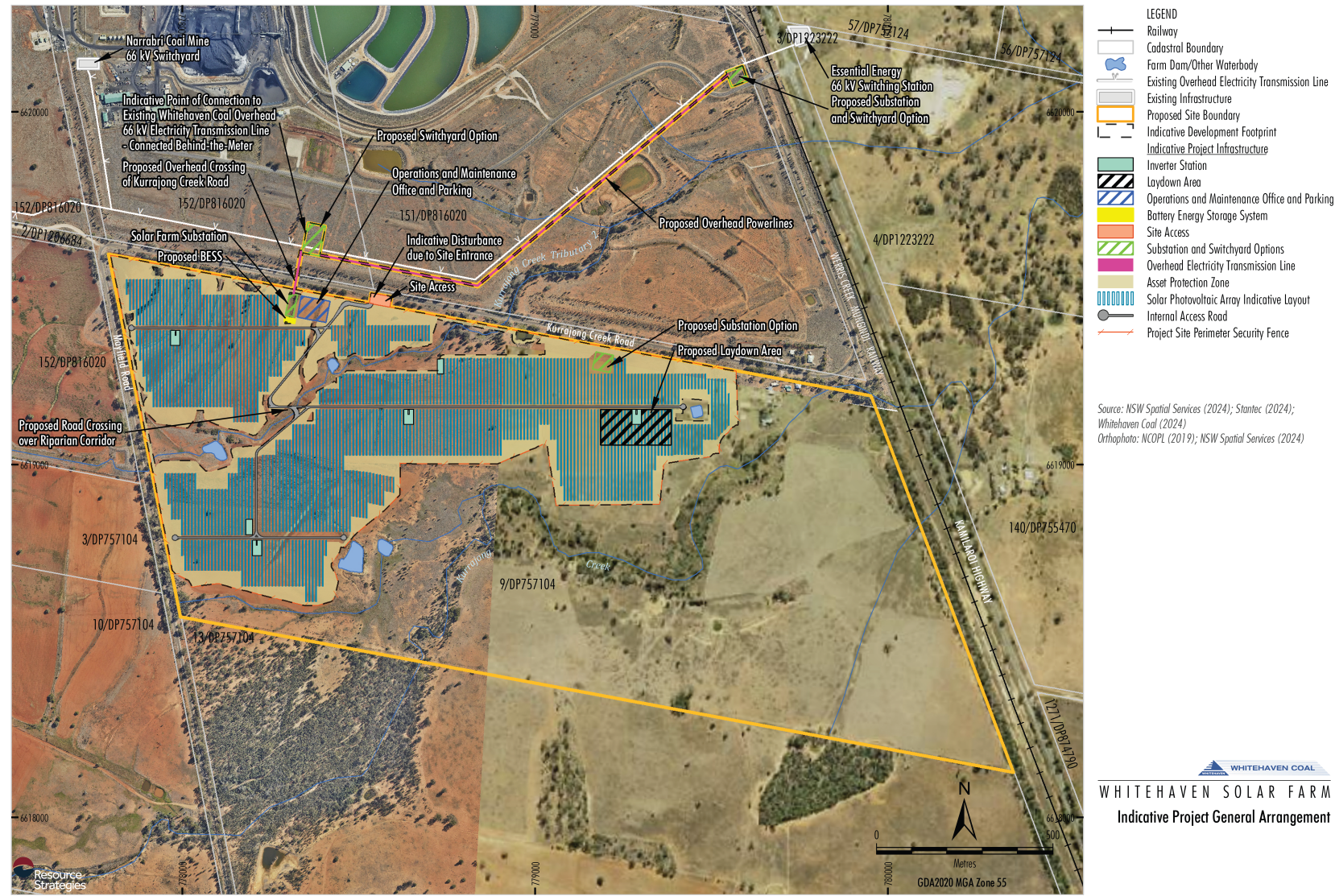


Figure 2-2 Project General Arrangement



3 OPERATIONAL NOISE

3.1 Operational Noise Criteria

The *NPfI* provides a framework for assessing environmental noise impacts from industrial premises and industrial development proposals in NSW.

The *NPfI* recommends the development of project noise trigger levels (PNTLs), which provide a benchmark for assessing industrial noise. The PNTLs should not be interpreted as mandatory noise criteria but, rather, as noise levels that, if exceeded, would indicate a potential noise impact on the community.

The PNTL is the lower value of the project intrusiveness noise level and the project amenity noise level. The project intrusiveness noise level assesses the likelihood of noise being intrusive above the ambient noise level and is applied to residential receivers only. The project amenity noise level ensures the total industrial noise from all sources in the area does not rise above a maximum acceptable level.

3.1.1 Project Intrusiveness Noise Levels

The intrusiveness noise level applies only to residential receivers and is the noise level 5 dB above the background noise level for each time period (daytime, evening or night-time). The Rating Background Level (RBL), representative of the background noise level, is derived from the measured L_{A90} noise levels determined using unattended monitoring. No background noise survey has been conducted for this Project. Instead, the intrusiveness criteria have been derived based on the minimum assumed RBLs presented in Table 2.1 of the *NPfI*.

Intrusiveness noise criteria levels for the project are summarised in **Table 3-1**.

Table 3-1 Project Intrusiveness Noise Levels

Assessment Period ¹	Minimum assumed RBL dBA	Project Intrusiveness Noise Level $L_{Aeq, 15min}$ dBA
Day	35	40
Evening	30	35
Night	30	35

Note 1: Day = 7am – 6pm; Evening = 6pm – 10pm; Night = 10pm – 7am,

3.1.2 Project Amenity Noise Levels

Project amenity noise levels aim to set a limit on continuing increases in noise levels from all industrial noise sources affecting a variety of receiver types; that is, the ambient noise level in an area from all industrial noise sources remains below recommended amenity noise levels.

The amenity assessment is based on noise criteria specific to land use and associated activities. The criteria relate only to industrial-type noise and do not include transportation noise (when on public transport corridors).

The recommended amenity noise level represents the objective for total industrial noise at a receiver location. The project amenity noise level represents the objective for noise from a single industrial development at a receiver location. For the purposes of this assessment, the closest privately-owned residential receivers to the Project have been classified as 'rural'.

To prevent increases in industrial noise due to the cumulative effect of several developments, the project amenity noise level for each new source of industrial noise is set at 5 dB below the recommended amenity noise level.

The project amenity noise levels for the Project are presented in **Table 3-2**. Due to different averaging periods for the $L_{Aeq,15min}$ and $L_{Aeq,period}$ noise descriptors, the values of project intrusiveness and amenity noise levels cannot be compared directly when identifying noise trigger levels (i.e., the most stringent values of each category). In order to make a comparison between descriptors, the *NPfI* assumes that the $L_{Aeq,15min}$ equivalent of an $L_{Aeq,period}$ noise level is equal to the $L_{Aeq,period}$ level plus 3 dB.

Table 3-2 Project Amenity Noise Levels

Receiver	Assessment Period ¹	Recommended Amenity Noise Level $L_{Aeq,period}$ dBA	Project Amenity Noise Level $L_{Aeq,period}$ dBA	Project Amenity Noise Level $L_{Aeq,15min}$ dBA
Rural Residential	Day	50	45	48
	Evening	45	40	43
	Night	40	35	38

Note 1: Day = 7am – 6pm; Evening = 6pm – 10pm; Night = 10pm – 7am

3.1.3 Project Noise Trigger Levels

The PNTLs are defined as the lower of the project intrusiveness and the project amenity noise levels. The PNTLs are summarised in **Table 3-3**.

Table 3-3 *NPfI* Overall Project Trigger Noise Levels

Location	Assessment Period ¹	Intrusiveness Criteria $L_{Aeq,15min}$ dBA	Amenity Criteria $L_{Aeq,15min}$ dBA	Project Noise Trigger Criteria $L_{Aeq,15min}$ dBA
Residential	Day	40	48	40
	Evening	35	43	35
	Night	35	38	35

Note 1: Day = 7am – 6pm; Evening = 6pm – 10pm; Night = 10pm – 7am, Early Night = 10pm – 12am

3.1.4 Cumulative Noise

The amenity noise level is the main mechanism of the *NPfI* for controlling the total noise from all industrial noise sources affecting a receiver.

Table 3-4 Cumulative Noise Criteria

Receiver	Noise Amenity Area	Time of day	L _{Aeq,period} , dBA	L _{Aeq,15min} dBA
Residential	Rural	Day	50	53
		Evening	45	48
		Night	40	43

3.1.5 Sleep Disturbance

Guidance for assessing the potential for sleep disturbance impacts on nearby residences is provided in Section 2.5 of the *NPfI*, which states:

Where the subject development/premises night-time noise levels at a residential location exceed:

- L_{Aeq,15min} 40 dB(A) or the prevailing RBL plus 5 dB, whichever is the greater, and/or
- L_{Amax} 52 dB(A) or the prevailing RBL plus 15 dB, whichever is the greater,

a detailed maximum noise level event assessment should be undertaken.

Based on the above, the night-time sleep disturbance screening noise level for the residential areas in the vicinity of the development is presented in **Table 3-5**.

Table 3-5 Sleep Disturbance Criteria

Location	Assessment Period	Minimum assumed Rating Background Level (RBL)	Sleep Disturbance Criteria, L _{Aeq,15min}	Sleep Disturbance Criteria, L _{Amax}
All Residential	10pm-7am	30	40	52

3.1.6 Modifying Factor Adjustments

Where a noise source contains certain characteristics, such as tonality, intermittency, irregularity or dominant low-frequency content, the noise may cause greater annoyance. The *NPfI* refers to these potentially annoying characteristics as “modifying factors”. Fact Sheet C of the *NPfI* recommends correction factors to be applied to the source noise level at the receiver before comparison with the criteria to account for the additional annoyance caused by these modifying factors.

It is not anticipated that any noise sources would be subject to modifying factors.

3.2 Operational Noise Assessment

3.2.1 Noise Modelling Methodology

Modelling of the operational noise emissions was undertaken using the CadnaA version 2023 modelling software.

The noise model was constructed from a combination of aerial photography, existing ground topography and proposed design drawings. The local terrain, source and receiver locations have been digitised in the noise model to develop a three-dimensional representation of the construction works and surrounding environment.

Fact Sheet D of the *NPfI* outlines standardised neutral and worst-case weather conditions for each period of the day, to be used in noise prediction models. These conditions are outlined in **Table 3-6**. Operational noise modelling results have been predicted considering standard and noise-enhancing meteorological conditions.

Table 3-6 Meteorological Conditions adopted for the Noise Modelling

Assessment period	Meteorological condition	Wind speed (m/s)	Wind direction (°)	Stability category (A to G)
Day/Evening	Standard	0.5	Worst-Case	D Class
	Noise-Enhancing (light wind)	3	Worst-Case	D Class
Night	Standard	0.5	Worst-Case	D Class
	Noise Enhancing (light wind)	3	Worst-Case	D Class
	Noise Enhancing (temperature inversion with light wind)	2	Worst-Case	F Class

The main operational noise sources associated with the Project would consist of six inverter stations with an assumed SWL of 94 dBA each, one Battery Energy Storage System (BESS) unit with an assumed SWL of 87 dBA, and two transformers, with an assumed SWL of 100 dBA.

3.2.2 Noise Predictions & Assessment

Table 3-7 provides the predicted operational noise levels for all receivers in the vicinity of the Project, compared to the most stringent *NPfI* criteria (night-time criteria). The noise predictions are provided under the relevant meteorological conditions determined in accordance with Fact Sheet D of the *NPfI*.

Table 3-7 Predicted Operational Noise Levels $L_{Aeq(15min)}$ dBA

Receiver	Predicted Noise Level $L_{Aeq,15min}$ dBA		
Criteria	35	35	35
Meteorology	D/0.5	D/3	F/2
669b	<20	<20	<20
670a	27	28	28
675a	23	24	24
676a	<20	<20	<20
677a	<20	<20	<20
680a	<20	<20	<20
687a	<20	<20	<20

No exceedances to the criteria discussed in **Section 3.1** are predicted.

3.2.3 Cumulative Noise

Cumulative noise from the Project and the neighbouring Narrabri Mine was considered, taking into account the most contemporary Narrabri Mine operational noise predictions without construction of shafts (RWDI, 2020). There are significant separation distances to other mine sites (Maules Creek [16 km], Boggabri [22 km], and Tarrawonga [24 km]) such that cumulative impacts are expected to be negligible.

Table 3-8 presents the reported noise levels from Narrabri mine, solar farm operation, and the cumulative noise level. Noise levels are presented for the worst-case noise enhancing condition.

The highest cumulative noise level was calculated at 39 dBA at receiver 670a, thus complying with the relevant amenity noise levels recommended by the *NPfl* (i.e., $L_{Aeq,15min}$ 53/48/43 dBA for day/evening/night).

Table 3-8 Cumulative Noise Level $L_{Aeq(15min)}$ dBA

Receiver	Noise Level $L_{Aeq(15min)}$ dBA			Night-time Recommended Amenity Noise Level $L_{Aeq(15min)}$ dBA
	Narrabri Mine	Solar Farm	Cumulative	
669b	39	28	39	43
670a	35	24	35	43
675a	31	<20	30	43
676a	<20	<20	<20	43
677a	<20	<20	<20	43



Receiver	Noise Level $L_{Aeq(15min)}$ dBA			Night-time Recommended Amenity Noise Level $L_{Aeq(15min)}$ dBA
	Narrabri Mine	Solar Farm	Cumulative	
680a	<20	<20	<20	43
687a	<20	<20	<20	43

3.2.4 Maximum Noise Level Events at Night

Noise from site operations at night is not expected to generate maximum noise level events, and therefore no assessment of L_{max} noise levels is warranted.

4 CONSTRUCTION NOISE

4.1 Construction Noise Criteria

The *ICNG* requires project-specific Noise Management Levels (NMLs) to be established for noise-sensitive receivers. In the event construction noise levels are predicted to be above the NMLs, all feasible and reasonable work practices are investigated to minimise noise emissions.

Having investigated all feasible and reasonable work practices, if construction noise levels are still predicted to exceed the NMLs then, in accordance with the SEARs issued for the Project, the potential noise impacts would be managed via site-specific construction noise management plans, to be prepared in the detailed design phase. **Table 4-1** details the *ICNG* noise management levels for residential uses.

Where possible, works should be completed during the standard daytime construction hours of Monday to Friday 7.00am to 6.00pm and Saturday 8.00am to 1.00pm. Works outside of standard construction hours (OOH), as identified in the *ICNG*, would only occur where acceptable noise management levels can be met (refer **Table 4-1**).

Table 4-1 Interim Construction Noise Guideline Criteria at Residences

Time of Day	NML	How to Apply
Standard Hours	Noise Affected RBL ¹ +10 dBA	The noise affected level represents the point above which there may be some community reaction to noise. Where the predicted or measured $L_{Aeq}(15min)$ is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to meet the noise affected level. The proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.
	Highly Noise Affected 75 dBA	The highly noise affected level represents the point above which there may be strong community reaction to noise. Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restricting the hours that the very noisy activities can occur, taking into account: 1. times identified by the community when they are less sensitive to noise (such as before and after school for works near schools, or mid-morning or mid-afternoon for works near residences; 2. if the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.
Outside Standard Hours	Noise Affected RBL ¹ +5 dBA	A strong justification would typically be required for works outside the recommended standard hours. The proponent should apply all feasible and reasonable work practices to meet the noise affected level. Where all feasible and reasonable practices have been applied and noise is more than 5 dBA above the noise affected level, the proponent should negotiate with the community. For guidance on negotiating agreements see section 7.2.2 of the <i>ICNG</i>.



Based on the above, **Table 4-2** presents the applicable noise management levels for construction activities at surrounding receivers. We note that these criteria may be conservative as they are based on the minimum assumed RBLs.

Table 4-2 Project-Specific Construction Noise Management Levels

Receiver Type	Construction Noise Management Level (NMLs) - $L_{Aeq,15min}$				Highly Noise Affected Noise Level – $L_{Aeq,15min}$
	Day Standard Hours ¹	Day OOH ¹	Evening OOH ²	Night OOH ³	
Residential	45	40	35	35	75

Note 1: Standard Hours (7am – 6pm Monday to Friday, 8am – 1pm Saturday with no work on Sundays or Public Holidays)

Note 2: Day OOH (Saturday 7am-8am and 1pm-6pm, 8am-6pm on Sundays or Public Holidays)

Note 3: Evening OOH (6pm – 10pm)

Note 4: Night OOH: all other time periods

4.2 Construction Noise Assessment

4.2.1 Construction Works and Hours

All construction/development activities are assumed to occur during standard construction hours as discussed in **Section 4.1**.

Construction activities for the Project would likely include:

- surveying and delineation of work areas;
- geotechnical investigations, including test pits and shallow augur holes;
- installation of sediment and erosion control measures (e.g. silt fencing);
- site clearing, grubbing and stripping;
- access road and laydown area construction;
- installation of office and maintenance areas;
- delivery and lay down of Project components;
- perimeter security fencing and entrance gate installation;
- foundation construction (substation and inverter stations);
- racking, east-west tracking system and photovoltaic panel installation;
- installation of inverters, intermediate step-up transformers (note these would generally be located next to the photovoltaic arrays), substation, communication towers and lighting;
- electrical cable installation (underground and/or aboveground); and
- site restoration, re-vegetation and landscaping.

4.2.2 Construction Noise Modelling

Modelling of the construction noise emissions was undertaken using the CadnaA version 2023 modelling software, with the same assumptions outlined for the operational noise modelling discussed in **Section 3.2**.

Only the predicted loudest stages have been modelled. Compliance during these stages implies compliance with all other stages. Based on the activities outlined in **Section 4.2.1**, the predicted loudest stages were identified as:

- Stage 1: Site Clearing, Grubbing, Stripping with Regrading, Roads
- Stage 2: Earthworks and Site Grading
- Stage 3: Access Road and Drainage Construction

An indicative equipment schedule for all construction phases and corresponding SWLs are summarised in **Table 4-3**.

Table 4-3 Construction Noise Sources & Sound Power Levels L_{Aeq} dBA

Item	Number of Items	Item Sound Power Level (LAeq15min dBA)	Total Sound Power Level (LAeq15min dBA)
Stage 1 - Site Clearing, Grubbing, Stripping with Regrading, Roads			
50tonne (t) Excavator	1	106	121
Mulcher	1	117	
Articulated Dump Truck	2	110	
Scraper	1	113	
CAT D10 Dozer	1	115	
Stage 2 - Earthworks and Site Grading			
50t Excavator	3	106	123
Articulated Dump Truck	2	110	
Scraper	2	113	
CAT D10 Dozer	2	115	
Grader	2	108	
Smooth Vibratory Drum Roller	2	108	
Compactor	2	109	
22 kilolitre (kL) Watercart	1	113	
Stage 3 - Access Road and Drainage Construction			
50t Excavator	1	106	116
30t Excavator	1	103	
Grader	2	108	
Smooth Vibratory Drum Roller	2	108	
Truck and Dog (travelling at low speed)	2	106	



It is unlikely that all items would operate within the same 15-minute period, however a conservative approach has been used to calculate the total SWL for each construction phase.

4.2.3 Construction Noise Assessment

Table 4-4 provides the predicted construction noise levels for all receivers in the vicinity of the Project.

Table 4-4 Predicted Construction Noise Levels $L_{Aeq(15min)}$ dBA

Receiver	Predicted Noise Level $L_{Aeq,15min}$ dBA					
	Stage 1		Stage 2		Stage 3	
Criteria	45	45	45	45	45	45
Meteorology	D/0.5	D/3	D/0.5	D/3	D/0.5	D/3
669b	<20	<20	<20	<20	<20	<20
670a	<20	<20	<20	<20	<20	<20
675a	39	40	42	42	35	36
676a	28	28	30	30	24	24
677a	<20	<20	<20	<20	<20	<20
680a	<20	<20	<20	<20	<20	<20
687a	30	30	32	32	26	26

The results of **Table 4-4** indicates that construction noise levels would comply with the ICNG 'noise affected' management levels at all privately-owned residential receivers.

5 TRAFFIC NOISE ASSESSMENT

During construction and operation of the Project, vehicle access will be via the Kamilaroi Highway and Kurrajong Creek Road, which is currently an access road for the existing Narrabri mine. The locations of these roads are shown in **Figure 5-1**.

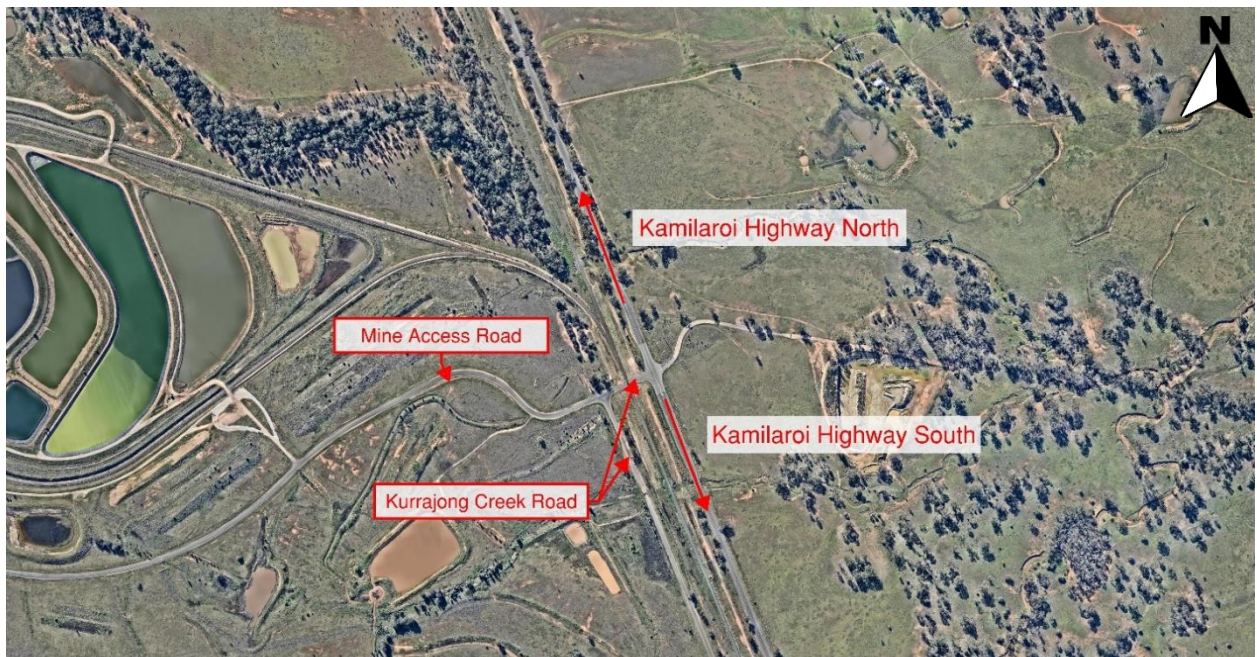


Figure 5-1 Local Road Network

Due to the significant distance separation between Kurrajong Creek Road and the nearest privately-owned residential receivers, traffic noise impacts associated with Kurrajong Creek Road are not anticipated and the traffic noise assessment has focused on the Kamilaroi Highway.

5.1 Road Traffic Noise Criteria

Criteria for assessment of noise from traffic on public roads are set out in the *RNP*. Kamilaroi Highway is considered as a freeway under this policy.

The road traffic noise criteria relevant to the Project, which are only applicable to privately-owned residential receivers, are presented in **Table 5-1**.

Table 5-1 Road Traffic Noise Criteria

Road Category	Type of Project / Land Use	Assessment Criteria - $L_{Aeq, Period}$	
		Day ¹	Night ¹
Freeway	Existing residences affected by additional traffic on existing freeway generated by land use developments	60	55

Note 1: Day = 7.00 am to 10.00 pm, Night = 10.00 pm – 7.00 am.



Reference is also made to sections 3.4 and 3.4.1 of the *RNP*. Section 3.4 notes that:

In assessing feasible and reasonable mitigation measures, an increase of up to 2 dB represents a minor impact that is considered barely perceptible to the average person.

Section 3.4.1 notes:

*For existing residences and other sensitive land uses affected by **additional traffic on existing roads generated by land use developments**, any increase in the total traffic noise level should be limited to 2 dB above that of the corresponding ‘no build option’.*

5.2 Road Traffic Noise Assessment

Traffic noise levels have been predicted using the Calculation of Road Traffic Noise (CoRTN) model developed by the Welsh Office of the United Kingdom Department of Transport (1988). The CoRTN method considers the following factors:

- Traffic flow volumes
- Average vehicle speed
- Percentage of heavy vehicles
- Gradient of road
- Type of road pavement
- Distance from receiver location to road
- Shielding from barriers / building and intervening topography
- Reflections from barriers / buildings
- Angle of view
- Building facade reflection correction
- Ground absorption

The existing traffic volumes on the Kamilaroi Highway are presented in **Table 5-2**.

Table 5-2 Existing Traffic Volumes

Road and Location	Vehicles Per Period			
	Day ¹		Night ¹	
	LV	HV	LV	HV
Kamilaroi Highway North of Kurrajong Creek Road	1,802	452	372	71
Kamilaroi Highway South of Kurrajong Creek Road	1,898	404	354	59

Source: The Transport Planning Partnership (2024)

Note 1: Day = 7.00 am to 10.00 pm, Night = 10.00 pm – 7.00 am.

During the construction stage, workers will be brought to the site using shuttle busses. The anticipated peak daily number of busses, as well as trucks used for construction work, are presented in **Table 5-3**.

Table 5-3 Additional Traffic Movements from Project

Road and Location	Vehicles Per Period			
	Day ¹		Night ¹	
	LV	HV	LV	HV
Kamilaroi Highway North of Kurrajong Creek Road	0	9	0	3
Kamilaroi Highway South of Kurrajong Creek Road	0	24	0	4

Source: The Transport Planning Partnership (2024)

Note 1: Day = 7.00 am to 10.00 pm, Night = 10.00 pm – 7.00 am.

Table 5-4 presents predicted noise levels for existing and new traffic volumes. The noise levels presented are for receivers 670a and 675a, which are the closest receivers on Kamilaroi Highway, north and south of Kurrajong Creek Road, respectively.

Table 5-4 Predicted Road Traffic Noise Levels

Receiver	Road and Location	Road Traffic Noise dBA			
		Existing		Existing + Project	
		Day ¹	Night ¹	Day ¹	Night ¹
		L _{Aeq,15hr}	L _{Aeq,9hr}	L _{Aeq,15hr}	L _{Aeq,9hr}
670a	Kamilaroi Highway North of Kurrajong Creek Road	59.1	51.5	59.1	51.6
675a	Kamilaroi Highway South of Kurrajong Creek Road	66.7	58.8	66.8	58.9

Note 1: Day = 7.00 am to 10.00 pm, Night = 10.00 pm – 7.00 am.

The additional road traffic noise from the Project does not result in any new exceedances of the road traffic noise criteria. Furthermore, the relative increase in traffic noise levels as a result of these additional movements will be negligible (≤ 0.1 dB), as the number of vehicle movements from construction would be negligible in comparison to the total number of vehicles expected to be travelling on the Kamilaroi Highway.

The traffic volumes during operation of the solar farm will be less than those occurring during construction, and therefore the changes to traffic noise levels during operation are also predicted to be negligible.

Therefore, traffic noise associated with the Project is not expected to impact the acoustic amenity of the surrounding community.



6 CONCLUSION

RWDI was engaged to prepare an NIA to evaluate noise associated with the Whitehaven Solar Farm Project.

The assessment indicated that operational, construction and traffic noise generated by the Project would comply with all relevant noise criteria, with no impact anticipated on the acoustic amenity of the surrounding community.



7 REFERENCES

NSW Environmental Protection Agency (2017) *Noise Policy for Industry* (NPfI)

NSW Department of Environment & Climate Change (2009) *Interim Construction Noise Guideline* (ICNG)

NSW Department of Environment, Climate Change & Water (2011) *NSW Road Noise Policy* (RNP)

NSW Department of Planning & Environment (2022) *Large-Scale Solar Energy Guideline*

RWDI (2020) *Narrabri Underground Mine Stage 3 Extension Project Environmental Impact Statement – Noise and Blasting Assessment*

Spectrum Acoustics (2015) *Narrabri Mine Stockpile Extension Modification*

The Transport Planning Partnership (2024) *Whitehaven Solar Farm Road Transport Assessment*



STATEMENT OF LIMITATIONS

This report entitled *Whitehaven Solar Farm Project - Noise Impact Assessment*, dated 9 December 2024, was prepared by RWDI Australia Pty Ltd ("RWDI") for Whitehaven Coal and Resource Strategies ("Client"). The findings and conclusions presented in this report have been prepared for the Client and are specific to the project described herein ("Project"). The conclusions and recommendations contained in this report are based on the information available to RWDI when this report was prepared. Because the contents of this report may not reflect the final design of the Project or subsequent changes made after the date of this report, RWDI recommends that it be retained by Client during the final stages of the project to verify that the results and recommendations provided in this report have been correctly interpreted in the final design of the Project.

The conclusions and recommendations contained in this report have also been made for the specific purpose(s) set out herein. Should the Client or any other third party utilize the report and/or implement the conclusions and recommendations contained therein for any other purpose or project without the involvement of RWDI, the Client or such third party assumes any and all risk of any and all consequences arising from such use and RWDI accepts no responsibility for any liability, loss, or damage of any kind suffered by Client or any other third party arising therefrom.

Finally, it is imperative that the Client and/or any party relying on the conclusions and recommendations in this report carefully review the stated assumptions contained herein and to understand the different factors which may impact the conclusions and recommendations provided.