



# Narrabri Mine Noise Monitoring

## Quarter Ending March 2025 Summary Noise Report

### Narrabri Coal Operations Pty Ltd

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Baan Baa NSW 2390

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|          |               |               |                  |                  |
|          |               |               |                  |                  |

## Basis of Report

This report has been prepared by SLR Consulting Australia (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with Narrabri Coal Operations Pty Ltd (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

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## Table of Contents

|   |           |
|---|-----------|
| <b>Basis of Report .....</b>  | <b>i</b>  |
| <b>1.0 Introduction .....</b>   | <b>1</b>  |
| <b>2.0 Performance Assessment And Discussion .....</b>                                      | <b>1</b>  |
| <b>3.0 Noise Criteria .....</b>   | <b>3</b>  |
| 3.1 Project Approval, EPL and NMP .....   | 3         |
| 3.2 Non-compliances & Exemptions .....  | 3         |
| 3.3 Attended Monitoring .....   | 4         |
| 3.3.1 EPL Monitoring Locations .....  | 4         |
| 3.3.2 NMP Monitoring Location .....   | 4         |
| 3.3.3 EPL Monitoring Requirements .....   | 4         |
| 3.3.4 NMP Monitoring Requirements .....   | 4         |
| <b>4.0 Operational Noise Monitoring Methodology .....</b>                                   | <b>5</b>  |
| 4.1 General Requirements .....  | 5         |
| 4.2 Methodology - Operator Attended Noise Monitoring .....                                  | 5         |
| <b>5.0 Results and Discussion .....</b>   | <b>7</b>  |
| 5.1 Results of Operator Attended Monitoring .....   | 7         |
| 5.1.1 Operator Attended Noise Survey Results – EPL Monitoring Location N5 .....             | 8         |
| 5.1.2 Operator Attended Noise Survey Results – EPL Monitoring Location N6 .....             | 12        |
| 5.1.3 Operator Attended Noise Survey Results – EPL Monitoring Location N8 .....             | 15        |
| 5.1.4 Operator Attended Noise Survey Results – EPL Monitoring Location N9 .....             | 18        |
| 5.1.5 Operator Attended Noise Survey Results – NMP Monitoring Location N1 (Bow Hills) ..... | 21        |
| <b>6.0 Conclusion .....</b>   | <b>22</b> |

## Tables in Text

|          |  |    |
|----------|--|----|
| Table 1  | Performance Assessment - Operations .....                                | 2  |
| Table 2  | Project Approval and EPL Noise Criteria .....                            | 3  |
| Table 3  | Noise Monitoring Locations .....   | 5  |
| Table 4  | Days of the Week Quarterly EPL Monitoring was Conducted – Q1 2025 .....  | 7  |
| Table 5  | Operator Attended EPL Noise Survey Results – N5 – Oakleigh (Day 1) ..... | 8  |
| Table 6  | Operator Attended EPL Noise Survey Results – N5 – Oakleigh (Day 2) ..... | 10 |
| Table 7  | Operator Attended EPL Noise Survey Results – N5 – Oakleigh (Day 3) ..... | 11 |
| Table 8  | Operator Attended EPL Noise Survey Results – N6 – Newhaven (Day 1) ..... | 12 |
| Table 9  | Operator Attended EPL Noise Survey Results – N6 – Newhaven (Day 2) ..... | 13 |
| Table 10 | Operator Attended EPL Noise Survey Results – N6 – Newhaven (Day 3) ..... | 14 |



|          |   |    |
|----------|---|----|
| Table 11 | Operator Attended EPL Noise Survey Results – N8 – Haylin View (Day 1) ..... | 15 |
| Table 12 | Operator Attended EPL Noise Survey Results – N8 – Haylin View (Day 2) ..... | 16 |
| Table 13 | Operator Attended EPL Noise Survey Results – N8 – Haylin View (Day 3) ..... | 17 |
| Table 14 | Operator Attended EPL Noise Survey Results – N9 – High Range (Day 1) .....  | 18 |
| Table 15 | Operator Attended EPL Noise Survey Results – N9 – High Range (Day 2) .....  | 19 |
| Table 16 | Operator Attended EPL Noise Survey Results – N9 – High Range (Day 3) .....  | 20 |
| Table 17 | Operator Attended NMP Noise Survey Results – N1 – Bow Hills .....           | 21 |

## Figures in Text

|          |  |   |
|----------|--|---|
| Figure 1 | Attended Noise Monitoring Locations..... | 6 |
|----------|--|---|

## Appendices

|            |                          |
|------------|--------------------------|
| Appendix A | Acoustic Terminology     |
| Appendix B | Calibration Certificates |



## 1.0 Introduction

Narrabri Coal Operations Pty Ltd has commissioned SLR Consulting Australia Pty Ltd (SLR) to conduct operational noise monitoring for the Narrabri Mine located near Narrabri, New South Wales (NSW) in accordance with the approved Noise Management Plan (NMP) dated August 2023, the Narrabri Mine Project Approval (PA) 08\_0144 and the Environment Protection Licence 12789 (EPL 12789).

The objectives of the noise monitoring programme for this operating period were as follows:

- Conduct operator attended noise surveys at 5 locations (as listed in **Section 3.3**) surrounding the mine during the day, evening and night-time periods.
- Quantify all sources of noise within each of the attended noise surveys, including their measured and/or estimated contribution and maximum level of individual noise sources.
- Assess the noise emissions of Narrabri Mine and determine compliance with respect to the limits contained in Section 2 of the NMP and the relevant approvals.

The following report uses specialist acoustic terminology. An explanation of common terms is provided in **Appendix A**.

## 2.0 Performance Assessment And Discussion

The following provides a summary of the attended noise measurements undertaken at each monitoring location. Further details are provided for each location in **Section 5.0** of this report.



**Table 1 Performance Assessment - Operations**

| EPL ID | Location                 | Date                    | Narrabri Mine Contribution, dBA |                      |                    |                  | Noise Criteria <sup>1</sup>  | Measurement Periods                                | Standard Weather |         |       | Compliant |
|--------|--------------------------|-------------------------|---------------------------------|----------------------|--------------------|------------------|--|--|------------------|---------|-------|-----------|
|        |                          |                         | LAeq(15 min) Day                | LAeq(15 min) Evening | LAeq(15 min) Night | LA1(1 min) Night |  |  | Day              | Evening | Night |           |
| N5     | Oakleigh <sup>2</sup>    | 24/03/2025 <sup>3</sup> | N/M                             | I/A                  | 25                 | 28               | Day, Evening, Night – LAeq(15min) - 35 dBA<br><br>Night LA1(1min) – 45 dBA | Day - 1.5 hrs<br>Evening - 0.5 hrs<br>Night – 1hrs | N                | Y       | Y     | Y         |
|        |                          | 25/03/2025 <sup>3</sup> | I/A                             | 32                   | 27                 | 36               |  |  | N                | Y       | Y     | Y         |
|        |                          | 26/03/2025 <sup>3</sup> | I/A                             | 20                   | I/A                | I/A              |  |  | N                | Y       | Y     | Y         |
| N6     | Newhaven                 | 24/03/2025 <sup>3</sup> | 30                              | 26                   | 20                 | 23               |  |  | Y                | Y       | Y     | Y         |
|        |                          | 25/03/2025 <sup>3</sup> | N/M                             | N/M                  | 30                 | 39               |  |  | N                | Y       | Y     | Y         |
|        |                          | 26/03/2025 <sup>3</sup> | 30                              | N/M                  | N/M                | N/M              |  |  | Y                | Y       | Y     | Y         |
| N8     | Haylin View <sup>2</sup> | 24/03/2025 <sup>3</sup> | 32                              | I/A                  | I/A                | I/A              |  |  | N                | Y       | Y     | Y         |
|        |                          | 25/03/2025 <sup>3</sup> | I/A                             | N/M                  | N.M                | N/M              |  |  | N                | Y       | Y     | Y         |
|        |                          | 26/03/2025 <sup>3</sup> | I/A                             | 25                   | 30                 | 32               |  |  | N                | Y       | Y     | Y         |
| N9     | High Range <sup>2</sup>  | 24/03/2025 <sup>3</sup> | 32                              | I/A                  | I/A                | I/A              |  |  | Y                | Y       | Y     | Y         |
|        |                          | 25/03/2025 <sup>3</sup> | I/A                             | I/A                  | 30                 | 34               |  |  | N                | Y       | Y     | Y         |
|        |                          | 26/03/2025 <sup>3</sup> | I/A                             | I/A                  | I/A                | I/A              |  |  | Y                | Y       | Y     | Y         |
| -      | Bow Hills <sup>1</sup>   | 26/03/2025              | I/A                             | I/A                  | I/A                | I/A              |  | Day - 15 min<br>Evening - 15 min<br>Night - 15 min | M                | Y       | Y     | Y         |

I/A = Inaudible, N/M = Not Measurable

Note 1: A private agreement between NCOPL and the residents of N1 Bow Hills of 50 dBA LAeq(15minute) is in place. This new level of 50 dBA LAeq(15minute) replaces the levels identified in Conditions 1-3, Schedule 4 of PA 08\_0144 Mod 2 and the identical limits contained in condition L3 of Environment Protection Licence No 12789.

Note 2: Property is owned by Narrabri Coal Operations. Noise limits contained in Conditions 1-3, Schedule 4 of PA 08\_0144 Mod 2 and the identical limits contained in condition L3 of Environment Protection Licence No 12789 are not applicable.

Note 3: Evening and Night monitoring conducted on this date, Day monitoring conducted during the following day period.



## 3.0 Noise Criteria

### 3.1 Project Approval, EPL and NMP

Noise monitoring at the Narrabri Mine was conducted in accordance with EPL 12789, the PA requirements and the NMP. The site specific EPL and PA noise limits are summarised in Section 2 of the NMP and are reproduced in **Table 2**. These criteria do not apply where the mine has an agreement with the relevant owner/s of the residence to generate higher noise levels, or where the property is mine owned.

**Table 2 Project Approval and EPL Noise Criteria**

| Location                       | Day            | Emergency Day  | Night          |              |
|--------------------------------|----------------|----------------|----------------|--------------|
|                                | LAeq(15minute) | LAeq(15minute) | LAeq(15minute) | LA1(1minute) |
| All Privately owned Residences | 35             | 35             | 35             | 45           |

### 3.2 Non-compliances & Exemptions

In accordance with Section 11.1.3 of the NSW Industrial Noise Policy (INP) a development is deemed to be in non-compliance with a noise consent or licence condition if the monitored noise level is more than 2 dB above the statutory noise limit specified in the consent or licence. This may occur for two reasons:

- The noise from the Narrabri Mine is excessive, in which case Narrabri Mine will be not complying with its consent or licence condition.
- The noise was increased by extreme, non-standard weather effects—in which case the Narrabri Mine is not considered to be in noncompliance with its consent or licence condition.

In this latter case, further monitoring at a later date is required to determine compliance under “normal” meteorological conditions.

The INP states in Section 9.2 that *“it is not practicable to meet the noise limit under all inversion events; hence exceedances under extreme temperature inversions are not considered to be a non-compliance with consent or licence conditions.”*

Non-standard weather effects include:

- Wind speeds greater than 3 m/s at 10m above ground level; or
- Stability category F temperature inversion conditions and wind speeds greater than 2 m/s at 10 metres above ground level; or
- Stability category G temperature inversion conditions

As stated in EPL 12789 *“Data recorded by the meteorological station identified as EPA Identification Point(s) W1 must be used to determine meteorological conditions and temperature inversion conditions (stability category) are to be determined by direct measurement over a minimum 50m height interval as referred to in Part E2 of Appendix E of the “New South Wales Industrial Noise Policy” dated January 2000 ISBN 0 7313 2715 2.”*

Weather and Temperature inversion monitoring is undertaken continuously in accordance with EPL 12789 with monitoring locations displayed in **Figure 1**. Monitoring Location W1



records wind speed and direction at 10m above ground level. Temperature inversion monitoring is undertaken continuously by directly measuring temperature at two elevations 50 m apart (10 m & 60 m from ground level) at monitoring location W2. All weather data reported in **Table 5** to **Table 17** have been recorded at these monitoring locations.

### 3.3 Attended Monitoring

Attended Noise monitoring is to be undertaken on a quarterly basis at residential areas. The attended monitoring will take place at the following locations:

#### 3.3.1 EPL Monitoring Locations

- N5 Oakleigh – 16293 Kamilaroi Highway Baan Baa
- N6 Newhaven – 184 Greylands Road Turrawan
- N8 Haylin View – 791 Mayfield Road, Baan Baa
- N9 High Range – 92 Davis Road Turrawan

It is noted that the Narrabri Mine own the properties Oakleigh (N5), Haylin View (N8) and High Range (N9).

#### 3.3.2 NMP Monitoring Location

- N1 Bow Hills – 16652 Kamilaroi Highway Baan Baa

It is noted that the Narrabri Mine has a private agreement with the landholder of Bow Hills (N1) for increased noise limits of 50 dBA  $L_{Aeq}(15\text{minute})$ . This new level replaces the levels identified in Conditions 1-3, Schedule 4 of PA 08\_0144 Mod 2 and the identical limits contained in condition L3 of Environment Protection Licence No 12789.

#### 3.3.3 EPL Monitoring Requirements

- At each one of the monitoring locations N5, N6, N8 and N9;
- Occur quarterly in a reporting period;
- Occur during each day, evening and night period as defined in the NSW Industrial Noise Policy for a minimum of:
  - i. 1.5 hours during the day;
  - ii. 30 minutes during the evening; and
  - iii. 1 hour during the night.
- Occur for three consecutive operating days.

#### 3.3.4 NMP Monitoring Requirements

- At monitoring location N1,
- Occur quarterly in a reporting period; and
- Occur during a day, evening and night period as defined in the NSW Industrial Noise Policy for a minimum 15 minutes.





## 4.0 Operational Noise Monitoring Methodology

### 4.1 General Requirements

All acoustic instrumentation employed throughout the monitoring programme has been designed to comply with the requirements of AS IEC 61672.1 – 2019 *Electroacoustics—Sound level meters*, AS IEC 60942 2017 *Electroacoustics – Sound calibrators* and carried current NATA or manufacturer calibration certificates. Instrument calibration was checked before and after each measurement survey, with the variation in calibrated levels not exceeding  $\pm 0.5$  dBA. Calibration certificates for all instruments employed during the monitoring campaign are presented in **Appendix B**.

### 4.2 Methodology - Operator Attended Noise Monitoring

Operator attended noise measurements were conducted during the day, evening and night-time periods for a minimum of 1.5 hours during the day; 30 minutes during the evening and 1 hour during the night at the three EPL nominated noise monitoring locations and for 15 minutes during the day, evening and night at each of the NMP nominated noise monitoring location representing the most affected receiver locations, listed in **Table 3** and shown in **Figure 1**. During the operator attended noise measurements, the character and relative contribution of ambient noise sources and mine contributions were determined.

**Table 3 Noise Monitoring Locations**

| Monitoring Location | Monitoring Requirements | Receiver Type | Address                                      | Monitoring Location - MGA Zone 55 |              |
|---------------------|-------------------------|---------------|--|-----------------------------------|--------------|
|                     |                         |               |  | Easting (m)                       | Northing (m) |
| N5 <sup>1,2</sup>   | EPL                     | Residence     | Oakleigh – 16293 Kamilaroi Highway Baan Baa  | 779526                            | 6617751      |
| N6 <sup>1,2</sup>   | EPL                     | Residence     | Newhaven – 184 Greylands Road Turrawan       | 776564                            | 6624643      |
| N8 <sup>1</sup>     | EPL                     | Residence     | Haylin View – 791 Mayfield Road Baan Baa     | 777428                            | 6617316      |
| N9 <sup>1</sup>     | EPL                     | Residence     | High Range – 92 Davis Road Turrawan          | 775879                            | 6625895      |
| N1 <sup>2</sup>     | NMP                     | Residence     | Bow Hills – 16652 Kamilaroi Highway Baan Baa | 780114                            | 6620641      |

Note: 1. EPL monitoring locations  
 2. NMP monitoring locations

The objective of the operator attended noise monitoring was to measure the  $LA_{1(1\text{minute})}$  and the  $LA_{eq(15\text{minute})}$  noise level contribution from the Narrabri Mine at the nearest potentially affected receptors in order to determine the noise contribution of operational activities associated with Narrabri Mine over each 15 minute measurement period. In addition, the operator quantifies and characterises the overall levels of ambient noise in the area (i.e.  $L_{Amax}$ ,  $LA_1$ ,  $LA_{10}$ ,  $LA_{90}$ , and  $LA_{eq}$ ) over the 15 minute measurement interval.

Operator attended noise measurements were conducted using one-third octave integrating Brüel & Kjær Type 2270 and 2250L sound level meters (s/n 3029485 and s/n 3005904 respectively). Attended noise measurements were undertaken by SLR staff Alex Bian and Adam Sirianni.



**Figure 1 Attended Noise Monitoring Locations**



**Table 4** presents a summary of which days of the week the quarterly monitoring was conducted, in accordance with condition M7.4 of EPL 12789 and Section 5 of the NMP.

**Table 4 Days of the Week Quarterly EPL Monitoring was Conducted – Q1 2025**

| Period                          | Day of the Week (Excluding Weekends and Public Holidays) |               |               |               |        |
|---------------------------------|--|---------------|---------------|---------------|--------|
|                                 | Monday   | Tuesday       | Wednesday     | Thursday      | Friday |
| <b>EPL Monitoring Locations</b> |  |               |               |               |        |
| Day                             |  | 25 March 2025 | 26 March 2025 | 27 March 2025 |        |
| Evening                         | 24 March 2025  | 25 March 2025 | 26 March 2025 |               |        |
| Night                           | 24 March 2025  | 25 March 2025 | 26 March 2025 |               |        |
| <b>NMP Monitoring Location</b>  |  |               |               |               |        |
| Day                             |  |               | 26 March 2025 |               |        |
| Evening                         |  |               | 26 March 2025 |               |        |
| Night                           |  |               | 26 March 2025 |               |        |

## 5.0 Results and Discussion

### 5.1 Results of Operator Attended Monitoring

Results of the operator attended noise surveys at N5, N6, N8, N9 and N1 are provided **Table 5** to **Table 17**.

Ambient noise levels presented include all noise sources such as transport (roads, rail and aircraft), fauna (insects, frogs, birds and bats), the natural environment (wind in trees), domestic noises, other industrial operations as well as Narrabri Mine noise emissions.

Weather data during the monitoring period has been obtained from the weather station located on the Narrabri Mine site and observed conditions.

The tables also provide the following information:

- Date and start time, operator and equipment details.
- Monitoring location.
- Wind velocity (m/s) and temperature (°C) at weather station W1, as detailed in **Section 3.2**.
- Typical maximum ( $L_{Amax}$ ) and contributed  $L_{Aeq(15minute)}$  noise levels.



### 5.1.1 Operator Attended Noise Survey Results – EPL Monitoring Location N5

Results of the operator attended noise surveys at N5 are provided in **Table 5**, **Table 6** and **Table 7**. Monitoring location N5 represents residential receptors located to the southeast of the site in Oakleigh.

**Table 5 Operator Attended EPL Noise Survey Results – N5 – Oakleigh (Day 1)**

| Period<br>Date/Start<br>Time<br>Weather<br>SLM Details                  | Criteria <sup>1</sup>              | Number | Stability<br>Category | Primary Noise Descriptor   |                          |                           |                           |                           |                            | Mine<br>Contribution,<br>(dBA) | Description  |
|---|------------------------------------|--------|-----------------------|----------------------------|--------------------------|---------------------------|---------------------------|---------------------------|----------------------------|--------------------------------|--|
|   |                                    |        |                       | L <sub>Amax</sub><br>(dBA) | L <sub>A1</sub><br>(dBA) | L <sub>A10</sub><br>(dBA) | L <sub>A90</sub><br>(dBA) | L <sub>Aeq</sub><br>(dBA) | L <sub>Amin</sub><br>(dBA) |                                |  |
| Day 1<br>25/03/2025 09:57<br>3.5 – 4.4 m/s SE<br>23-26°C<br>3029485     | 35 dBA<br>L <sub>Aeq</sub> (15min) | 1      | D                     | 55                         | 46                       | 39                        | 29                        | 36                        | 26                         | N/M                            | <b>Site Related Noise Events:</b><br>Main exhaust vent fan faintly audible at times<br><br><b>Other Noise Events:</b><br>Traffic 35-42<br>Birds 45-61<br>Aircraft 53 |
|   |                                    | 2      | D                     | 49                         | 40                       | 38                        | 30                        | 35                        | 27                         | N/M                            |  |
|   |                                    | 3      | D                     | 57                         | 47                       | 42                        | 33                        | 39                        | 29                         | I/A                            |  |
|   |                                    | 4      | C                     | 48                         | 44                       | 40                        | 32                        | 37                        | 28                         | I/A                            |  |
|   |                                    | 5      | C                     | 53                         | 48                       | 43                        | 33                        | 40                        | 30                         | I/A                            |  |
|   |                                    | 6      | C                     | 61                         | 47                       | 41                        | 34                        | 40                        | 29                         | I/A                            |  |
| Evening 1<br>24/03/2025 19:41<br>1.1 – 1.2 m/s SE<br>23-24°C<br>3029485 | 35 dBA<br>L <sub>Aeq</sub> (15min) | 1      | F                     | 61                         | 59                       | 52                        | 37                        | 49                        | 30                         | I/A                            | <b>Site Related Noise Events:</b><br>Inaudible<br><br><b>Other Noise Events:</b><br>Traffic 45-48<br>Insects 47-52<br>Train 61                                       |
|   |                                    | 2      | F                     | 52                         | 51                       | 50                        | 48                        | 49                        | 46                         | I/A                            |  |



| Period<br>Date/Start<br>Time<br>Weather<br>SLM Details             | Criteria <sup>1</sup>  | Number | Stability<br>Category | Primary Noise Descriptor   |                          |                           |                           |                           |                            | Mine<br>Contribution,<br>(dBA)             | Description   |
|--|--|--------|-----------------------|----------------------------|--------------------------|---------------------------|---------------------------|---------------------------|----------------------------|--|---|
|  |  |        |                       | L <sub>Amax</sub><br>(dBA) | L <sub>A1</sub><br>(dBA) | L <sub>A10</sub><br>(dBA) | L <sub>A90</sub><br>(dBA) | L <sub>Aeq</sub><br>(dBA) | L <sub>Amin</sub><br>(dBA) |  |   |
| Night 1<br>24/03/2025 23:08<br>1.4 – 1.9 m/s NW<br>22°C<br>3029485 | 35 dBA<br>L <sub>Aeq</sub> (15min)<br>45 dBA<br>L <sub>A1</sub> (1min) | 1      | E                     | 45                         | 43                       | 42                        | 39                        | 41                        | 28                         | <25 L <sub>Aeq</sub><br>26 L <sub>A1</sub> | <b>Site Related Noise Events:</b><br>General surface activity 20-25<br><br><b>Other Noise Events:</b><br>Dozer operations 25-28<br>Traffic 44-49<br>Insects 38-42 |
|  |  | 2      | E                     | 48                         | 47                       | 45                        | 42                        | 43                        | 39                         | 25 L <sub>Aeq</sub><br>27 L <sub>A1</sub>  |   |
|  |  | 3      | E                     | 49                         | 48                       | 45                        | 42                        | 44                        | 39                         | 25 L <sub>Aeq</sub><br>28 L <sub>A1</sub>  |   |
|  |  | 4      | E                     | 46                         | 45                       | 44                        | 41                        | 42                        | 36                         | 25 L <sub>Aeq</sub><br>28 L <sub>A1</sub>  |   |

Note: N/M = Not Measurable, I/A = Inaudible

Note 1: Mine owned receiver – criteria not applicable.





**Table 6 Operator Attended EPL Noise Survey Results – N5 – Oakleigh (Day 2)**

| Period<br>Date/Start<br>Time<br>Weather<br>SLM Details              | Criteria <sup>1</sup>  | Number | Stability<br>Category | Primary Noise Descriptor   |                          |                           |                           |                           |                            | Mine<br>Contribution,<br>(dBA)             | Description  |
|---|--|--------|-----------------------|----------------------------|--------------------------|---------------------------|---------------------------|---------------------------|----------------------------|--|--|
|   |  |        |                       | L <sub>Amax</sub><br>(dBA) | L <sub>A1</sub><br>(dBA) | L <sub>A10</sub><br>(dBA) | L <sub>A90</sub><br>(dBA) | L <sub>Aeq</sub><br>(dBA) | L <sub>Amin</sub><br>(dBA) |  |  |
| Day 2<br>26/03/2025 10:46<br>4.3 – 5.0 m/s SE<br>22-25°C<br>3029485 | 35 dBA<br>L <sub>Aeq</sub> (15min)                                     | 1      | D                     | 62                         | 49                       | 43                        | 37                        | 41                        | 33                         | I/A  | <b>Site Related Noise Events:</b><br>Inaudible<br><b>Other Noise Events:</b><br>Aircraft 48-52<br>Wind 40-45<br>Birds 50-62<br>Traffic 41-46     |
|   |  | 2      | D                     | 53                         | 47                       | 42                        | 36                        | 40                        | 32                         | I/A  |  |
|   |  | 3      | D                     | 53                         | 46                       | 44                        | 37                        | 41                        | 33                         | I/A  |  |
|   |  | 4      | D                     | 51                         | 46                       | 42                        | 35                        | 39                        | 32                         | I/A  |  |
|   |  | 5      | C                     | 56                         | 48                       | 44                        | 36                        | 41                        | 33                         | I/A  |  |
|   |  | 6      | B                     | 54                         | 47                       | 43                        | 37                        | 41                        | 34                         | I/A  |  |
| Evening 2<br>25/03/2025 20:37<br>1.9 – 2.5 m/s W<br>22°C<br>3029485 | 35 dBA<br>L <sub>Aeq</sub> (15min)                                     | 1      | E                     | 49                         | 47                       | 46                        | 43                        | 45                        | 38                         | 30 L <sub>Aeq</sub>                        | <b>Site Related Noise Events:</b><br>Dozer operations 25-38<br>Onsite alarms 30<br><b>Other Noise Events:</b><br>Insects 40-48<br>Traffic 41-48  |
|   |  | 2      | E                     | 48                         | 47                       | 46                        | 42                        | 45                        | 39                         | 32 L <sub>Aeq</sub>                        |  |
| Night 2<br>25/03/2025 22:00<br>0 – 1.8 m/s NW<br>21-22°C<br>3029485 | 35 dBA<br>L <sub>Aeq</sub> (15min)<br>45 dBA<br>L <sub>A1</sub> (1min) | 1      | E                     | 42                         | 40                       | 39                        | 34                        | 37                        | 31                         | 26 L <sub>Aeq</sub><br>31 L <sub>A1</sub>  | <b>Site Related Noise Events:</b><br>Dozer operations 25-33<br>Onsite alarms 30<br><b>Other Noise Events:</b><br>Insects 40-42<br>Aircraft 47-49 |
|   |  | 2      | E                     | 43                         | 41                       | 40                        | 35                        | 38                        | 32                         | 26 L <sub>Aeq</sub><br>33 L <sub>A1</sub>  |  |
|   |  | 3      | E                     | 47                         | 41                       | 40                        | 37                        | 38                        | 32                         | <25 L <sub>Aeq</sub><br>31 L <sub>A1</sub> |  |
|   |  | 4      | E                     | 49                         | 44                       | 42                        | 35                        | 39                        | 30                         | 27 L <sub>Aeq</sub><br>36 L <sub>A1</sub>  |  |

Note: N/M = Not Measurable, I/A = Inaudible

Note 1: Mine owned receiver – criteria not applicable.



**Table 7 Operator Attended EPL Noise Survey Results – N5 – Oakleigh (Day 3)**

| Period<br>Date/Start<br>Time<br>Weather<br>SLM Details               | Criteria <sup>1</sup>  | Number | Stability<br>Category | Primary Noise Descriptor   |                          |                           |                           |                           |                            | Mine<br>Contribution,<br>(dBA) | Description  |
|--|--|--------|-----------------------|----------------------------|--------------------------|---------------------------|---------------------------|---------------------------|----------------------------|--------------------------------|--|
|  |  |        |                       | L <sub>Amax</sub><br>(dBA) | L <sub>A1</sub><br>(dBA) | L <sub>A10</sub><br>(dBA) | L <sub>A90</sub><br>(dBA) | L <sub>Aeq</sub><br>(dBA) | L <sub>Amin</sub><br>(dBA) |                                |  |
| Day 3<br>27/03/2025 09:17<br>3.2 – 4.3 m/s SE<br>20-21°C<br>3029485  | 35 dBA<br>L <sub>Aeq</sub> (15min)                                     | 1      | D                     | 62                         | 45                       | 39                        | 33                        | 38                        | 31                         | I/A                            | <b>Site Related Noise Events:</b><br><br><b>Other Noise Events:</b><br>Traffic 43-54<br>Birds 50-63<br>Train 51-58   |
|  |  | 2      | D                     | 54                         | 45                       | 41                        | 35                        | 39                        | 33                         | I/A                            |  |
|  |  | 3      | D                     | 50                         | 43                       | 39                        | 34                        | 37                        | 31                         | I/A                            |  |
|  |  | 4      | D                     | 58                         | 48                       | 43                        | 35                        | 40                        | 33                         | I/A                            |  |
|  |  | 5      | D                     | 60                         | 47                       | 40                        | 35                        | 39                        | 33                         | I/A                            |  |
|  |  | 6      | D                     | 57                         | 49                       | 42                        | 35                        | 40                        | 33                         | I/A                            |  |
| Evening 3<br>26/03/2025 20:46<br>0.9 – 1.3 m/s SE<br>20°C<br>3029485 | 35 dBA<br>L <sub>Aeq</sub> (15min)                                     | 1      | E                     | 54                         | 44                       | 39                        | 30                        | 36                        | 25                         | 20 L <sub>Aeq</sub>            | <b>Site Related Noise Events:</b><br>General surface activity 20-23<br><b>Other Noise Events:</b><br>Traffic 40-54<br>Insects 30-38                        |
|  |  | 2      | E                     | 54                         | 49                       | 43                        | 32                        | 41                        | 26                         | I/A                            |  |
| Night 3<br>26/03/2025 22:00<br>0 – 1.0 m/s N/NE<br>20°C<br>3029485   | 35 dBA<br>L <sub>Aeq</sub> (15min)<br>45 dBA<br>L <sub>A1</sub> (1min) | 1      | E                     | 55                         | 53                       | 48                        | 41                        | 45                        | 38                         | I/A                            | <b>Site Related Noise Events:</b><br>Inaudible<br><b>Other Noise Events:</b><br>Traffic 44-50<br>Insects 40-44<br>Train 53-54<br>Aircraft 43<br>Bats 50-59 |
|  |  | 2      | E                     | 49                         | 46                       | 44                        | 41                        | 43                        | 38                         | I/A                            |  |
|  |  | 3      | E                     | 58                         | 45                       | 44                        | 36                        | 41                        | 24                         | I/A                            |  |
|  |  | 4      | E                     | 47                         | 45                       | 43                        | 39                        | 42                        | 32                         | I/A                            |  |

Note: N/M = Not Measurable, I/A = Inaudible

Note 1: Mine owned receiver – criteria not applicable.



## 5.1.2 Operator Attended Noise Survey Results – EPL Monitoring Location N6

Results of the operator attended noise surveys at N6 are provided in **Table 8**, **Table 9** and **Table 10**. Monitoring location N6 represents residential receptors located to the northwest of the site in Newhaven.

**Table 8 Operator Attended EPL Noise Survey Results – N6 – Newhaven (Day 1)**

| Period<br>Date/Start<br>Time<br>Weather<br>SLM Details                    | Criteria <sup>1</sup>  | Number | Stability<br>Category | Primary Noise Descriptor   |                          |                           |                           |                           |                            | Mine<br>Contribution,<br>(dBA)            | Description   |
|---|--|--------|-----------------------|----------------------------|--------------------------|---------------------------|---------------------------|---------------------------|----------------------------|---|---|
|   |  |        |                       | L <sub>Amax</sub><br>(dBA) | L <sub>A1</sub><br>(dBA) | L <sub>A10</sub><br>(dBA) | L <sub>A90</sub><br>(dBA) | L <sub>Aeq</sub><br>(dBA) | L <sub>Amin</sub><br>(dBA) |   |   |
| Day 1<br>25/03/2025 07:52<br>1.9 – 4.0 m/s<br>SSE<br>21-23°C<br>3029485   | 35 dBA<br>L <sub>Aeq</sub> (15min)                                     | 1      | E                     | 71                         | 52                       | 43                        | 34                        | 44                        | 30                         | 29 L <sub>Aeq</sub>                       | <b>Site Related Noise Events:</b><br>Dozer operations 30-37<br><b>Other Noise Events:</b><br>Traffic 40-48<br>Birds 50-71<br>Horn 49                  |
|   |  | 2      | E                     | 57                         | 48                       | 42                        | 35                        | 40                        | 31                         | 30 L <sub>Aeq</sub>                       |   |
|   |  | 3      | E                     | 55                         | 49                       | 43                        | 35                        | 40                        | 30                         | 30 L <sub>Aeq</sub>                       |   |
|   |  | 4      | D                     | 66                         | 51                       | 45                        | 34                        | 42                        | 29                         | N/M                                       |   |
|   |  | 5      | D                     | 68                         | 51                       | 45                        | 35                        | 44                        | 31                         | N/M                                       |   |
|   |  | 6      | D                     | 51                         | 45                       | 40                        | 34                        | 38                        | 31                         | N/M                                       |   |
| Evening 1<br>24/03/2025 18:44<br>1.0 – 1.9 m/s SE<br>24-25°C<br>3029485   | 35 dBA<br>L <sub>Aeq</sub> (15min)                                     | 1      | E                     | 69                         | 56                       | 43                        | 32                        | 43                        | 30                         | N/M                                       | <b>Site Related Noise Events:</b><br>Dozer operations 25-28<br>Main exhaust vent fan 25-28<br><b>Other Noise Events:</b><br>Birds 68<br>Traffic 40-46 |
|   |  | 2      | E                     | 50                         | 46                       | 42                        | 32                        | 38                        | 30                         | 26 L <sub>Aeq</sub>                       |   |
| Night 1<br>25/03/2025 00:26<br>1.6 – 2.2 m/s<br>WNW<br>21-22°C<br>3029485 | 35 dBA<br>L <sub>Aeq</sub> (15min)<br>45 dBA<br>L <sub>A1</sub> (1min) | 1      | E                     | 55                         | 39                       | 37                        | 33                        | 35                        | 31                         | 20 L <sub>Aeq</sub><br>23 L <sub>A1</sub> | <b>Site Related Noise Events:</b><br>Dozer operations 20-23<br><b>Other Noise Events:</b><br>Traffic 35-43<br>Insects 33-42<br>Birds 55               |
|   |  | 2      | E                     | 54                         | 39                       | 38                        | 35                        | 37                        | 32                         | N/M                                       |   |
|   |  | 3      | E                     | 39                         | 36                       | 35                        | 33                        | 34                        | 30                         | I/A                                       |   |
|   |  | 4      | E                     | 43                         | 39                       | 34                        | 31                        | 33                        | 29                         | I/A                                       |   |

Note: N/M = Not Measurable, I/A = Inaudible





**Table 9 Operator Attended EPL Noise Survey Results – N6 – Newhaven (Day 2)**

| Period<br>Date/Start<br>Time<br>Weather<br>SLM Details                      | Criteria <sup>1</sup>  | Number | Stability<br>Category | Primary Noise Descriptor   |                          |                           |                           |                           |                            | Mine<br>Contribution,<br>(dBA)            | Description  |
|---|--|--------|-----------------------|----------------------------|--------------------------|---------------------------|---------------------------|---------------------------|----------------------------|---|--|
|   |  |        |                       | L <sub>Amax</sub><br>(dBA) | L <sub>A1</sub><br>(dBA) | L <sub>A10</sub><br>(dBA) | L <sub>A90</sub><br>(dBA) | L <sub>Aeq</sub><br>(dBA) | L <sub>Amin</sub><br>(dBA) |   |  |
| Day 2<br>26/03/2025 07:03<br>3.1 – 4.7 m/s SE<br>21°C<br>3029485            | 35 dBA<br>L <sub>Aeq</sub> (15min)                                     | 1      | E                     | 66                         | 59                       | 48                        | 41                        | 47                        | 37                         | N/M                                       | <b>Site Related Noise Events:</b><br>Main exhaust vent fan faintly audible<br><br><b>Other Noise Events:</b><br>Birds 50-66<br>Traffic 38-48<br>Wind 40-45 |
|   |  | 2      | E                     | 60                         | 50                       | 45                        | 38                        | 43                        | 35                         | N/M                                       |  |
|   |  | 3      | E                     | 56                         | 49                       | 45                        | 36                        | 42                        | 33                         | N/M                                       |  |
|   |  | 4      | D                     | 66                         | 57                       | 47                        | 39                        | 46                        | 34                         | N/M                                       |  |
|   |  | 5      | D                     | 57                         | 49                       | 45                        | 37                        | 42                        | 33                         | N/M                                       |  |
|   |  | 6      | D                     | 57                         | 46                       | 41                        | 36                        | 39                        | 34                         | N/M                                       |  |
| Evening 2<br>25/03/2025 19:45<br>2.1 – 2.4 m/s<br>WNW<br>22-23°C<br>3029485 | 35 dBA<br>L <sub>Aeq</sub> (15min)                                     | 1      | E                     | 49                         | 45                       | 42                        | 38                        | 41                        | 35                         | I/A                                       | <b>Site Related Noise Events:</b><br>Main exhaust vent fan faintly audible<br><br><b>Other Noise Events:</b><br>Traffic 43-49<br>Insects 40-43             |
|   |  | 2      | E                     | 49                         | 46                       | 43                        | 40                        | 42                        | 37                         | N/M                                       |  |
| Night 2<br>25/03/2025 23:23<br>0 – 1.0 m/s NW<br>21°C<br>3029485            | 35 dBA<br>L <sub>Aeq</sub> (15min)<br>45 dBA<br>L <sub>A1</sub> (1min) | 1      | E                     | 42                         | 40                       | 39                        | 34                        | 37                        | 31                         | 30 L <sub>Aeq</sub><br>39 L <sub>A1</sub> | <b>Site Related Noise Events:</b><br>Main exhaust vent fan 25-39<br>Dozer operations 30-36<br><br><b>Other Noise Events:</b><br>Traffic 37-45<br>Impact 56 |
|   |  | 2      | E                     | 43                         | 41                       | 40                        | 35                        | 38                        | 32                         | 29 L <sub>Aeq</sub><br>36 L <sub>A1</sub> |  |
|   |  | 3      | E                     | 47                         | 41                       | 40                        | 37                        | 38                        | 32                         | 28 L <sub>Aeq</sub><br>35 L <sub>A1</sub> |  |
|   |  | 4      | E                     | 49                         | 44                       | 42                        | 35                        | 39                        | 30                         | 29 L <sub>Aeq</sub><br>36 L <sub>A1</sub> |  |

Note: N/M = Not Measurable, I/A = Inaudible



**Table 10 Operator Attended EPL Noise Survey Results – N6 – Newhaven (Day 3)**

| Period<br>Date/Start<br>Time<br>Weather<br>SLM Details                 | Criteria <sup>1</sup>  | Number | Stability<br>Category | Primary Noise Descriptor   |                          |                           |                           |                           |                            | Mine<br>Contribution,<br>(dBA) | Description  |
|--|--|--------|-----------------------|----------------------------|--------------------------|---------------------------|---------------------------|---------------------------|----------------------------|--------------------------------|--|
|  |  |        |                       | L <sub>Amax</sub><br>(dBA) | L <sub>A1</sub><br>(dBA) | L <sub>A10</sub><br>(dBA) | L <sub>A90</sub><br>(dBA) | L <sub>Aeq</sub><br>(dBA) | L <sub>Amin</sub><br>(dBA) |                                |  |
| Day 3<br>26/03/2025 07:09<br>2.0 – 2.9 m/s SE<br>19-20°C<br>3029485    | 35 dBA<br>L <sub>Aeq</sub> (15min)                                     | 1      | E                     | 66                         | 55                       | 48                        | 36                        | 45                        | 28                         | 28 L <sub>Aeq</sub>            | <b>Site Related Noise Events:</b><br>Dozer operations 27-30<br>Main exhaust vent fan 29-30<br><b>Other Noise Events:</b><br>Traffic 50-53<br>Birds 52-72<br>Train 47 |
|  |  | 2      | E                     | 72                         | 53                       | 46                        | 36                        | 45                        | 31                         | 28 L <sub>Aeq</sub>            |  |
|  |  | 3      | E                     | 55                         | 49                       | 44                        | 36                        | 41                        | 31                         | 29 L <sub>Aeq</sub>            |  |
|  |  | 4      | E                     | 64                         | 50                       | 44                        | 35                        | 42                        | 31                         | 29 L <sub>Aeq</sub>            |  |
|  |  | 5      | E                     | 56                         | 48                       | 43                        | 37                        | 41                        | 34                         | 28 L <sub>Aeq</sub>            |  |
|  |  | 6      | D                     | 69                         | 51                       | 45                        | 34                        | 43                        | 29                         | 30 L <sub>Aeq</sub>            |  |
| Evening 3<br>26/03/2025 19:56<br>0 – 0.9 m/s SE<br>20-21°C<br>3029485  | 35 dBA<br>L <sub>Aeq</sub> (15min)                                     | 1      | E                     | 47                         | 43                       | 40                        | 27                        | 37                        | 24                         | I/A                            | <b>Site Related Noise Events:</b><br>Dozer operations briefly audible<br><b>Other Noise Events:</b><br>Traffic 35-48<br>Insects 30-33<br>Aircraft 38                 |
|  |  | 2      | E                     | 48                         | 45                       | 40                        | 27                        | 36                        | 23                         | N/M                            |  |
| Night 3<br>26/03/2025 23:24<br>0.7 – 2.1 m/s<br>SSE<br>20°C<br>3029485 | 35 dBA<br>L <sub>Aeq</sub> (15min)<br>45 dBA<br>L <sub>A1</sub> (1min) | 1      | F                     | 54                         | 47                       | 37                        | 25                        | 34                        | 23                         | I/A                            | <b>Site Related Noise Events:</b><br>Main exhaust vent fan faintly audible<br><b>Other Noise Events:</b><br>Traffic 45-54<br>Train 47                                |
|  |  | 2      | F                     | 50                         | 43                       | 40                        | 26                        | 34                        | 25                         | N/M                            |  |
|  |  | 3      | F                     | 42                         | 37                       | 33                        | 26                        | 30                        | 24                         | N/M                            |  |
|  |  | 4      | F                     | 37                         | 31                       | 29                        | 26                        | 28                        | 25                         | N/M                            |  |

Note: N/M = Not Measurable, I/A = Inaudible



### 5.1.3 Operator Attended Noise Survey Results – EPL Monitoring Location N8

Results of the operator attended noise surveys at N8 are provided in **Table 11**, **Table 12** and **Table 13**. Monitoring location N8 represents residential receptors located to the southeast of the site in Haylin View.

**Table 11 Operator Attended EPL Noise Survey Results – N8 – Haylin View (Day 1)**

| Period<br>Date/Start Time<br>Weather<br>SLM Details                         | Criteria <sup>1</sup>  | Number | Stability<br>Category | Primary Noise Descriptor   |                          |                           |                           |                           |                            | Mine<br>Contribution,<br>(dBA) | Description   |
|---|--|--------|-----------------------|----------------------------|--------------------------|---------------------------|---------------------------|---------------------------|----------------------------|--------------------------------|---|
|   |  |        |                       | L <sub>Amax</sub><br>(dBA) | L <sub>A1</sub><br>(dBA) | L <sub>A10</sub><br>(dBA) | L <sub>A90</sub><br>(dBA) | L <sub>Aeq</sub><br>(dBA) | L <sub>Amin</sub><br>(dBA) |                                |   |
| Day 1<br>25/03/2025 10:09<br>3.5 – 4.4 m/s SE<br>23-26°C<br>3005904         | 35 dBA<br>L <sub>Aeq</sub> (15min)                                     | 1      | D                     | 55                         | 47                       | 39                        | 29                        | 36                        | 25                         | I/A                            | <b>Site Related Noise Events:</b><br>Dozer operation 30-32<br><b>Other Noise Events:</b><br>Insects 36-55<br>Animals 33-53<br>Traffic 41-58 |
|   |  | 2      | D                     | 56                         | 49                       | 40                        | 30                        | 38                        | 26                         | I/A                            |   |
|   |  | 3      | D                     | 57                         | 49                       | 40                        | 29                        | 38                        | 25                         | 32 L <sub>Aeq</sub>            |   |
|   |  | 4      | C                     | 53                         | 46                       | 40                        | 31                        | 37                        | 27                         | I/A                            |   |
|   |  | 5      | C                     | 52                         | 44                       | 40                        | 30                        | 37                        | 26                         | I/A                            |   |
|   |  | 6      | C                     | 58                         | 49                       | 38                        | 28                        | 37                        | 24                         | I/A                            |   |
| Evening 1<br>24/03/2025 20:37<br>Calm<br>23°C<br>3005904                    | 35 dBA<br>L <sub>Aeq</sub> (15min)                                     | 1      | F                     | 55                         | 53                       | 45                        | 36                        | 42                        | 34                         | I/A                            | <b>Site Related Noise Events:</b><br>Inaudible<br><b>Other Noise Events:</b><br>Insects 35-45<br>Birds 42-55                                |
|   |  | 2      | E                     | 55                         | 42                       | 40                        | 34                        | 37                        | 32                         | I/A                            |   |
| Night 1<br>24/03/2025 22:03<br>0.5 – 1.9 m/s<br>SE/NW<br>22-23°C<br>3005904 | 35 dBA<br>L <sub>Aeq</sub> (15min)<br>45 dBA<br>L <sub>A1</sub> (1min) | 1      | F                     | 69                         | 40                       | 39                        | 34                        | 38                        | 30                         | I/A                            | <b>Site Related Noise Events:</b><br>Inaudible<br><b>Other Noise Events:</b><br>Insects 35-47<br>Birds 44-69                                |
|   |  | 2      | E                     | 43                         | 39                       | 38                        | 33                        | 35                        | 30                         | I/A                            |   |
|   |  | 3      | E                     | 51                         | 46                       | 40                        | 35                        | 38                        | 34                         | I/A                            |   |
|   |  | 4      | E                     | 49                         | 38                       | 36                        | 28                        | 33                        | 26                         | I/A                            |   |

Note: N/M = Not Measurable, I/A = Inaudible

Note 1: Mine owned receiver – criteria not applicable



**Table 12 Operator Attended EPL Noise Survey Results – N8 – Haylin View (Day 2)**

| Period<br>Date/Start<br>Time<br>Weather<br>SLM Details              | Criteria <sup>1</sup>  | Number | Stability<br>Category | Primary Noise Descriptor   |                          |                           |                           |                           |                            | Mine<br>Contribution,<br>(dBA) | Description  |
|---|--|--------|-----------------------|----------------------------|--------------------------|---------------------------|---------------------------|---------------------------|----------------------------|--------------------------------|--|
|   |  |        |                       | L <sub>Amax</sub><br>(dBA) | L <sub>A1</sub><br>(dBA) | L <sub>A10</sub><br>(dBA) | L <sub>A90</sub><br>(dBA) | L <sub>Aeq</sub><br>(dBA) | L <sub>Amin</sub><br>(dBA) |                                |  |
| Day 2<br>26/03/2025 11:44<br>3.5 – 5.0 m/s SE<br>24-25°C<br>3005904 | 35 dBA<br>L <sub>Aeq</sub> (15min)                                     | 1      | C                     | 52                         | 44                       | 40                        | 31                        | 36                        | 26                         | I/A                            | <b>Site Related Noise Events:</b><br>Inaudible<br><b>Other Noise Events:</b><br>Insects 30-41<br>Wind 38-42<br>Birds 37-55<br>Aircraft 35-37           |
|   |  | 2      | B                     | 55                         | 45                       | 41                        | 32                        | 38                        | 27                         | I/A                            |  |
|   |  | 3      | A                     | 50                         | 44                       | 41                        | 31                        | 37                        | 26                         | I/A                            |  |
|   |  | 4      | B                     | 50                         | 43                       | 39                        | 30                        | 36                        | 25                         | I/A                            |  |
|   |  | 5      | A                     | 49                         | 43                       | 39                        | 30                        | 36                        | 26                         | I/A                            |  |
|   |  | 6      | B                     | 51                         | 42                       | 38                        | 29                        | 35                        | 24                         | I/A                            |  |
| Evening 2<br>24/03/2025 20:44<br>1.6 – 2.5 m/s W<br>22°C<br>3005904 | 35 dBA<br>L <sub>Aeq</sub> (15min)                                     | 1      | E                     | 42                         | 37                       | 35                        | 32                        | 34                        | 30                         | N/M                            | <b>Site Related Noise Events:</b><br>Site noise faintly audible<br><b>Other Noise Events:</b><br>Insects 38-42   |
|   |  | 2      | E                     | 38                         | 35                       | 33                        | 30                        | 32                        | 28                         | N/M                            |  |
| Night 2<br>24/03/2025 22:00<br>0 – 1.8 m/s NW<br>21-22°C<br>3005904 | 35 dBA<br>L <sub>Aeq</sub> (15min)<br>45 dBA<br>L <sub>A1</sub> (1min) | 1      | E                     | 50                         | 36                       | 34                        | 30                        | 32                        | 28                         | N/M                            | <b>Site Related Noise Events:</b><br>Main exhaust fan faintly audible<br><b>Other Noise Events:</b><br>Impact 38-50<br>Insects 36-41<br>Aircraft 35-37 |
|   |  | 2      | E                     | 49                         | 37                       | 35                        | 30                        | 33                        | 28                         | N/M                            |  |
|   |  | 3      | E                     | 40                         | 37                       | 36                        | 30                        | 33                        | 28                         | N/M                            |  |
|   |  | 4      | E                     | 39                         | 37                       | 35                        | 32                        | 34                        | 31                         | N/M                            |  |

Note: N/M = Not Measurable, I/A = Inaudible

Note 1: Mine owned receiver – criteria not applicable.



**Table 13 Operator Attended EPL Noise Survey Results – N8 – Haylin View (Day 3)**

| Period<br>Date/Start<br>Time<br>Weather<br>SLM Details               | Criteria <sup>1</sup>  | Number | Stability<br>Category | Primary Noise Descriptor   |                          |                           |                           |                           |                            | Mine<br>Contribution,<br>(dBA)            | Description  |
|--|--|--------|-----------------------|----------------------------|--------------------------|---------------------------|---------------------------|---------------------------|----------------------------|---|--|
|  |  |        |                       | L <sub>Amax</sub><br>(dBA) | L <sub>A1</sub><br>(dBA) | L <sub>A10</sub><br>(dBA) | L <sub>A90</sub><br>(dBA) | L <sub>Aeq</sub><br>(dBA) | L <sub>Amin</sub><br>(dBA) |   |  |
| Day 3<br>27/03/2025 11:10<br>3.1 – 4.4 m/s SE<br>21-22°C<br>3005904  | 35 dBA<br>L <sub>Aeq</sub> (15min)                                     | 1      | D                     | 58                         | 44                       | 38                        | 30                        | 36                        | 27                         | I/A                                       | <b>Site Related Noise Events:</b><br>Inaudible<br><b>Other Noise Events:</b><br>Birds 30-58<br>Wind 33-38  |
|  |  | 2      | D                     | 56                         | 44                       | 36                        | 31                        | 35                        | 28                         | I/A                                       |  |
|  |  | 3      | D                     | 53                         | 42                       | 35                        | 29                        | 33                        | 26                         | I/A                                       |  |
|  |  | 4      | D                     | 55                         | 44                       | 37                        | 29                        | 35                        | 26                         | I/A                                       |  |
|  |  | 5      | D                     | 56                         | 47                       | 37                        | 30                        | 36                        | 27                         | I/A                                       |  |
|  |  | 6      | D                     | 54                         | 45                       | 37                        | 29                        | 35                        | 25                         | I/A                                       |  |
| Evening 3<br>26/03/2025 20:48<br>0.9 – 1.3 m/s SE<br>20°C<br>3005904 | 35 dBA<br>L <sub>Aeq</sub> (15min)                                     | 1      | E                     | 48                         | 43                       | 37                        | 31                        | 35                        | 27                         | 24 L <sub>Aeq</sub>                       | <b>Site Related Noise Events:</b><br>Dozer operation 30-37<br><b>Other Noise Events:</b><br>Insects 32-49  |
|  |  | 2      | E                     | 49                         | 47                       | 37                        | 31                        | 37                        | 28                         | N/M                                       |  |
| Night 3<br>26/03/2025 22:02<br>0 – 1.0 m/s N/NE<br>20°C<br>3005904   | 35 dBA<br>L <sub>Aeq</sub> (15min)<br>45 dBA<br>L <sub>A1</sub> (1min) | 1      | E                     | 49                         | 45                       | 36                        | 28                        | 34                        | 26                         | I/A                                       | <b>Site Related Noise Events:</b><br>Dozer operation 29-32<br><b>Other Noise Events:</b><br>Birds 27-38<br>Insects 27-28<br>Aircraft 30-43<br>Impact 50-61 |
|  |  | 2      | E                     | 49                         | 48                       | 36                        | 28                        | 35                        | 26                         | 25 L <sub>Aeq</sub><br>32 L <sub>A1</sub> |  |
|  |  | 3      | E                     | 61                         | 48                       | 39                        | 28                        | 36                        | 24                         | I/A                                       |  |
|  |  | 4      | E                     | 50                         | 48                       | 39                        | 28                        | 37                        | 26                         | 30 L <sub>Aeq</sub><br>32 L <sub>A1</sub> |  |

Note: N/M = Not Measurable, I/A = Inaudible

Note 1: Mine owned receiver – criteria not applicable.



#### 5.1.4 Operator Attended Noise Survey Results – EPL Monitoring Location N9

Results of the operator attended noise surveys at N9 are provided in **Table 14**, **Table 15** and **Table 16**. Monitoring location N9 represents residential receptors located to the northwest of the site in High Range.

**Table 14 Operator Attended EPL Noise Survey Results – N9 – High Range (Day 1)**

| Period<br>Date/Start<br>Time<br>Weather<br>SLM Details                  | Criteria <sup>1</sup>  | Number | Stability<br>Category | Primary Noise Descriptor   |                          |                           |                           |                           |                            | Mine<br>Contribution,<br>(dBA) | Description  |
|---|--|--------|-----------------------|----------------------------|--------------------------|---------------------------|---------------------------|---------------------------|----------------------------|--------------------------------|--|
|   |  |        |                       | L <sub>Amax</sub><br>(dBA) | L <sub>A1</sub><br>(dBA) | L <sub>A10</sub><br>(dBA) | L <sub>A90</sub><br>(dBA) | L <sub>Aeq</sub><br>(dBA) | L <sub>Amin</sub><br>(dBA) |                                |  |
| Day 1<br>25/03/2025 08:00<br>2.2 – 4.0 m/s SE<br>21-23°C<br>3005904     | 35 dBA<br>L <sub>Aeq</sub> (15min)                                     | 1      | E                     | 66                         | 48                       | 41                        | 33                        | 40                        | 27                         | I/A                            | <b>Site Related Noise Events:</b><br>Dozer operation audible for two minutes 37-41<br><b>Other Noise Events:</b><br>Birds 37-76<br>Traffic 36-41<br>Aircraft 37-61 |
|   |  | 2      | E                     | 59                         | 47                       | 41                        | 33                        | 39                        | 28                         | I/A                            |  |
|   |  | 3      | D                     | 76                         | 57                       | 43                        | 34                        | 48                        | 30                         | I/A                            |  |
|   |  | 4      | D                     | 61                         | 49                       | 42                        | 33                        | 40                        | 28                         | I/A                            |  |
|   |  | 5      | D                     | 68                         | 60                       | 45                        | 35                        | 46                        | 29                         | I/A                            |  |
|   |  | 6      | D                     | 65                         | 60                       | 48                        | 32                        | 47                        | 27                         | 32 L <sub>Aeq</sub>            |  |
| Evening 1<br>24/03/2025 19:35<br>1.1 – 1.2 m/s SE<br>23-24°C<br>3005904 | 35 dBA<br>L <sub>Aeq</sub> (15min)                                     | 1      | F                     | 55                         | 52                       | 43                        | 36                        | 41                        | 32                         | I/A                            | <b>Site Related Noise Events:</b><br>Inaudible<br><b>Other Noise Events:</b><br>Insects 35-55  |
|   |  | 2      | F                     | 49                         | 41                       | 39                        | 35                        | 38                        | 34                         | I/A                            |  |
| Night 1<br>24/03/2025 23:38<br>1.7 – 2.2 m/s<br>WSW<br>22°C<br>3005904  | 35 dBA<br>L <sub>Aeq</sub> (15min)<br>45 dBA<br>L <sub>A1</sub> (1min) | 1      | E                     | 45                         | 41                       | 39                        | 32                        | 36                        | 27                         | I/A                            | <b>Site Related Noise Events:</b><br>Inaudible<br><b>Other Noise Events:</b><br>Insects 30-45  |
|   |  | 2      | E                     | 42                         | 39                       | 38                        | 27                        | 35                        | 25                         | I/A                            |  |
|   |  | 3      | E                     | 40                         | 32                       | 28                        | 26                        | 28                        | 25                         | I/A                            |  |
|   |  | 4      | E                     | 37                         | 31                       | 29                        | 27                        | 28                        | 26                         | I/A                            |  |

Note: N/M = Not Measurable, I/A = Inaudible

Note 1: Mine owned receiver – criteria not applicable.



**Table 15 Operator Attended EPL Noise Survey Results – N9 – High Range (Day 2)**

| Period<br>Date/Start<br>Time<br>Weather<br>SLM Details                      | Criteria <sup>1</sup>  | Number | Stability<br>Category | Primary Noise Descriptor   |                          |                           |                           |                           |                            | Mine<br>Contribution,<br>(dBA)            | Description  |
|---|--|--------|-----------------------|----------------------------|--------------------------|---------------------------|---------------------------|---------------------------|----------------------------|---|--|
|   |  |        |                       | L <sub>Amax</sub><br>(dBA) | L <sub>A1</sub><br>(dBA) | L <sub>A10</sub><br>(dBA) | L <sub>A90</sub><br>(dBA) | L <sub>Aeq</sub><br>(dBA) | L <sub>Amin</sub><br>(dBA) |   |  |
| Day 2<br>26/03/2025 09:37<br>3.7 – 4.6 m/s SE<br>21-23°C<br>3005904         | 35 dBA<br>L <sub>Aeq</sub> (15min)                                     | 1      | D                     | 50                         | 40                       | 38                        | 31                        | 35                        | 29                         | I/A                                       | <b>Site Related Noise Events:</b><br>Inaudible<br><b>Other Noise Events:</b><br>Insects 36-37<br>Traffic 32-39<br>Birds 36-65<br>Aircraft 33-41    |
|   |  | 2      | D                     | 58                         | 48                       | 39                        | 32                        | 38                        | 30                         | I/A                                       |  |
|   |  | 3      | D                     | 58                         | 49                       | 39                        | 31                        | 38                        | 28                         | I/A                                       |  |
|   |  | 4      | D                     | 53                         | 43                       | 39                        | 32                        | 36                        | 29                         | I/A                                       |  |
|   |  | 5      | D                     | 64                         | 45                       | 38                        | 32                        | 38                        | 30                         | I/A                                       |  |
|   |  | 6      | D                     | 65                         | 47                       | 40                        | 33                        | 40                        | 30                         | I/A                                       |  |
| Evening 2<br>25/03/2025 19:45<br>2.1 – 2.4 m/s<br>WNW<br>22-23°C<br>3005904 | 35 dBA<br>L <sub>Aeq</sub> (15min)                                     | 1      | E                     | 51                         | 41                       | 40                        | 36                        | 39                        | 33                         | I/A                                       | <b>Site Related Noise Events:</b><br>Inaudible<br><b>Other Noise Events:</b><br>Traffic 36-43<br>Impact 50-51<br>Aircraft 38-39<br>Train 39-43     |
|   |  | 2      | E                     | 43                         | 41                       | 40                        | 37                        | 39                        | 33                         | I/A                                       |  |
| Night 2<br>25/03/2025 23:34<br>0 – 1.1 m/s<br>NW/NE<br>21°C<br>3005904      | 35 dBA<br>L <sub>Aeq</sub> (15min)<br>45 dBA<br>L <sub>A1</sub> (1min) | 1      | E                     | 37                         | 33                       | 31                        | 28                        | 30                        | 27                         | 30 L <sub>Aeq</sub><br>31 L <sub>A1</sub> | <b>Site Related Noise Events:</b><br>Main exhaust fan 29-31<br>Dozer operation 30-34<br><b>Other Noise Events:</b><br>Traffic 35-44<br>Birds 35-39 |
|   |  | 2      | E                     | 37                         | 33                       | 32                        | 28                        | 30                        | 27                         | 30 L <sub>Aeq</sub><br>34 L <sub>A1</sub> |  |
|   |  | 3      | E                     | 43                         | 34                       | 32                        | 28                        | 30                        | 26                         | 30 L <sub>Aeq</sub><br>34 L <sub>A1</sub> |  |
|   |  | 4      | E                     | 44                         | 38                       | 33                        | 29                        | 32                        | 26                         | N/M                                       |  |

Note: N/M = Not Measurable, I/A = Inaudible

Note 1: Mine owned receiver – criteria not applicable.



**Table 16 Operator Attended EPL Noise Survey Results – N9 – High Range (Day 3)**

| Period<br>Date/Start<br>Time<br>Weather<br>SLM Details                 | Criteria <sup>1</sup>  | Number | Stability<br>Category | Primary Noise Descriptor   |                          |                           |                           |                           |                            | Mine<br>Contribution,<br>(dBA) | Description   |
|--|--|--------|-----------------------|----------------------------|--------------------------|---------------------------|---------------------------|---------------------------|----------------------------|--------------------------------|---|
|  |  |        |                       | L <sub>Amax</sub><br>(dBA) | L <sub>A1</sub><br>(dBA) | L <sub>A10</sub><br>(dBA) | L <sub>A90</sub><br>(dBA) | L <sub>Aeq</sub><br>(dBA) | L <sub>Amin</sub><br>(dBA) |                                |   |
| Day 3<br>27/03/2025 09:09<br>2.9 – 4.1 m/s SE<br>20-21°C<br>3005904    | 35 dBA<br>L <sub>Aeq</sub> (15min)                                     | 1      | D                     | 55                         | 46                       | 40                        | 33                        | 38                        | 29                         | I/A                            | <b>Site Related Noise Events:</b><br>Inaudible<br><b>Other Noise Events:</b><br>Local traffic 56-74<br>Birds 41-76<br>Traffic 33-39 |
|  |  | 2      | D                     | 69                         | 64                       | 50                        | 34                        | 50                        | 31                         | I/A                            |   |
|  |  | 3      | D                     | 76                         | 59                       | 49                        | 34                        | 49                        | 29                         | I/A                            |   |
|  |  | 4      | D                     | 66                         | 54                       | 41                        | 32                        | 41                        | 29                         | I/A                            |   |
|  |  | 5      | D                     | 56                         | 44                       | 39                        | 33                        | 37                        | 29                         | I/A                            |   |
|  |  | 6      | D                     | 76                         | 69                       | 46                        | 32                        | 54                        | 29                         | I/A                            |   |
| Evening 3<br>26/03/2025 19:50<br>0 – 0.9 m/s SE<br>20-21°C<br>3005904  | 35 dBA<br>L <sub>Aeq</sub> (15min)                                     | 1      | E                     | 48                         | 43                       | 37                        | 31                        | 35                        | 27                         | I/A                            | <b>Site Related Noise Events:</b><br>Inaudible<br><b>Other Noise Events:</b><br>Traffic 31-39<br>Birds 42-47                        |
|  |  | 2      | E                     | 49                         | 47                       | 37                        | 31                        | 37                        | 28                         | I/A                            |   |
| Night 3<br>27/03/2025 00:11<br>1.5 – 2.1 m/s<br>SSE<br>20°C<br>3005904 | 35 dBA<br>L <sub>Aeq</sub> (15min)<br>45 dBA<br>L <sub>A1</sub> (1min) | 1      | F                     | 41                         | 35                       | 35                        | 25                        | 33                        | 22                         | I/A                            | <b>Site Related Noise Events:</b><br>Inaudible<br><b>Other Noise Events:</b><br>Impact 40-55<br>Birds 30-49<br>Insects 31-39        |
|  |  | 2      | F                     | 46                         | 40                       | 36                        | 32                        | 35                        | 24                         | I/A                            |   |
|  |  | 3      | F                     | 55                         | 48                       | 35                        | 26                        | 35                        | 24                         | I/A                            |   |
|  |  | 4      | F                     | 39                         | 35                       | 34                        | 27                        | 32                        | 25                         | I/A                            |   |

Note: N/M = Not Measurable, I/A = Inaudible

Note 1: Mine owned receiver – criteria not applicable.





### 5.1.5 Operator Attended Noise Survey Results – NMP Monitoring Location N1 (Bow Hills)

Results of the operator attended noise surveys at N1 are provided in **Table 17**. Monitoring location N1 represents residential receptors located to the east of the site in Bow Hills.

**Table 17 Operator Attended NMP Noise Survey Results – N1 – Bow Hills**

| Period<br>Date/Start<br>Time<br>Weather<br>SLM Details       | Criteria <sup>1</sup>              | Number | Stability<br>Category | Primary Noise Descriptor   |                          |                           |                           |                           |                            | Mine<br>Contribution,<br>(dBA) | Description  |
|--|------------------------------------|--------|-----------------------|----------------------------|--------------------------|---------------------------|---------------------------|---------------------------|----------------------------|--------------------------------|--|
|  |                                    |        |                       | L <sub>Amax</sub><br>(dBA) | L <sub>A1</sub><br>(dBA) | L <sub>A10</sub><br>(dBA) | L <sub>A90</sub><br>(dBA) | L <sub>Aeq</sub><br>(dBA) | L <sub>Amin</sub><br>(dBA) |                                |  |
| Day<br>26/03/2025 08:50<br>4.0 m/s SE<br>21°C<br>3029485     | 50 dBA<br>L <sub>Aeq</sub> (15min) | 1      | D                     | 70                         | 56                       | 50                        | 38                        | 47                        | 33                         | I/A                            | <b>Site Related Noise Events:</b><br>Inaudible<br><b>Other Noise Events:</b><br>Traffic 52-61<br>Birds 63-70   |
| Evening<br>26/03/2025 19:27<br>0.9 m/s SE<br>21°C<br>3029485 | 50 dBA<br>L <sub>Aeq</sub> (15min) | 1      | E                     | 56                         | 53                       | 45                        | 25                        | 42                        | 23                         | I/A                            | <b>Site Related Noise Events:</b><br>Inaudible<br><b>Other Noise Events:</b><br>Traffic 40-56<br>Insects 33-38 |
| Night<br>26/03/2025 23:35<br>1.7 m/s SSE<br>20°C<br>3005904  | 50 dBA<br>L <sub>Aeq</sub> (15min) | 1      | F                     | 53                         | 44                       | 35                        | 24                        | 33                        | 23                         | I/A                            | <b>Site Related Noise Events:</b><br>Inaudible<br><b>Other Noise Events:</b><br>Insects 23-24<br>Traffic 33-53 |

Note 1: A private agreement between NCOPL and the residents of N1 Bow Hills of 50 dBA L<sub>Aeq</sub>(15minute) is in place. This new level of 50 dBA L<sub>Aeq</sub>(15minute) replaces the levels identified in Conditions 1-3, Schedule 4 of PA 08\_0144 Mod 2 and the identical limits contained in condition L3 of Environment Protection Licence No 1278



## 6.0 Conclusion

SLR was engaged by Narrabri Coal Operations Pty Ltd to conduct attended noise monitoring for the Narrabri Mine in accordance with the Narrabri Mines' Noise Management Plan, Environment Protection Licence and Project Approval.

Operator attended noise monitoring was conducted at five locations in order to determine the noise performance of the Narrabri Mine, with compliance achieved at all privately owned receiver locations.





# **Appendix A    Acoustic Terminology**

## **Narrabri Mine Noise Monitoring**

**Quarter Ending March 2025 Summary Noise Report**

**Narrabri Coal Operations Pty Ltd**

SLR Project No.: 610.018063.00175

15 April 2025

## 1 Sound Level Or Noise Level

The terms “sound” and “noise” are almost interchangeable, except that in common usage “noise” is often used to refer to unwanted sound.

Sound (or noise) consists of minute fluctuations in atmospheric pressure capable of evoking the sense of hearing. The human ear responds to changes in sound pressure over a very wide range. The loudest sound pressure to which the human ear responds is ten million times greater than the softest. The decibel (abbreviated as dB) scale reduces this ratio to a more manageable size by the use of logarithms.

The symbols SPL, L or Lp are commonly used to represent sound pressure level. The symbol la represents a-weighted sound pressure level. The standard reference unit for sound pressure levels expressed in decibels is  $2 \times 10^{-5}$  pa.

## 2 “A” Weighted Sound Pressure Level

The overall level of a sound is usually expressed in terms of dBA, which is measured using a sound level meter with an “a-weighting” filter. This is an electronic filter having a frequency response corresponding approximately to that of human hearing.

People’s hearing is most sensitive to sounds at mid frequencies (500 hz to 4000 hz), and less sensitive at lower and higher frequencies. Thus, the level of a sound in dba is a good measure of the loudness of that sound. Different sources having the same dba level generally sound about equally loud.

A change of 1 dBA or 2 dBA in the level of a sound is difficult for most people to detect, whilst a 3 dBA to 5 dBA change corresponds to a small but noticeable change in loudness. A 10 dBA change corresponds to an approximate doubling or halving in loudness. The table below lists examples of typical noise levels.

| Sound Pressure Level (dBA) | Typical Source                             | Subjective Evaluation |
|----------------------------|--|-----------------------|
| 130                        | Threshold of pain                          | Intolerable           |
| 120                        | Heavy rock concert                         | Extremely noisy       |
| 110                        | Grinding on steel                          |                       |
| 100                        | Loud car horn at 3 m                       | Very noisy            |
| 90                         | Construction site with pneumatic hammering |                       |
| 80                         | Kerbside of busy street                    | Loud                  |
| 70                         | Loud radio or television                   |                       |
| 60                         | Department store                           | Moderate to quiet     |
| 50                         | General Office                             |                       |
| 40                         | Inside private office                      | Quiet to very quiet   |
| 30                         | Inside bedroom                             |                       |
| 20                         | Recording studio                           | Almost silent         |

Other weightings (eg b, c and d) are less commonly used than a-weighting. Sound levels measured without any weighting are referred to as “linear”, and the units are expressed as dB(lin) or db.

## 3 Sound Power Level

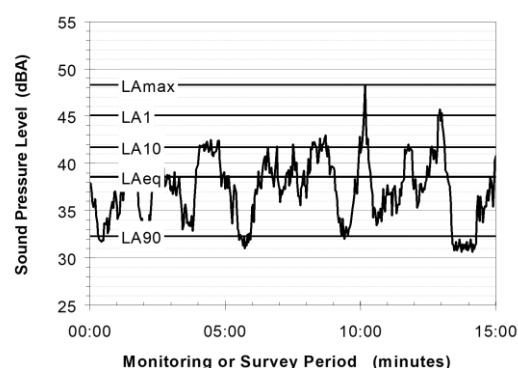
The sound power of a source is the rate at which it emits acoustic energy. As with sound pressure levels, sound power levels are expressed in decibel units (dB or dBa), but may be identified by the symbols SWL or Lw, or by the reference unit  $10^{-1}$

The relationship between sound power and sound pressure may be likened to an electric radiator, which is characterised by a power rating, but has an effect on the surrounding environment that can be measured in terms of a different parameter, temperature.

## 4 STATISTICAL NOISE LEVELS

Sounds that vary in level over time, such as road traffic noise and most community noise, are commonly described in terms of the statistical exceedance levels LAn, where LAn is the a-weighted sound pressure level exceeded for n% of a given measurement period. For example, the LA1 is the noise level exceeded for 1% of the time, LA10 the noise exceeded for 10% of the time, and so on.

The following figure presents a hypothetical 15 minute noise survey, illustrating various common statistical indices of interest.



Of particular relevance, are:

LA1 the noise level exceeded for 1% of the 15 minute interval.

LA10 the noise level exceeded for 10% of the 15 minute interval. This is commonly referred to as the average maximum noise level.

LA90 the noise level exceeded for 90% of the sample period. This noise level is described as the average minimum background sound level (in the absence of the source under consideration), or simply the background level.

LAeq the a-weighted equivalent noise level (basically the average noise level). It is defined as the steady sound level that contains the same amount of acoustical energy as the corresponding time-varying sound.

When dealing with numerous days of statistical noise data, it is sometimes necessary to define the typical noise levels at a given monitoring location for a particular time of day. A standardised method is available for determining these representative levels.

This method produces a level representing the “repeatable minimum” LA90 noise level over the daytime and night-time measurement periods, as required by the EPA. In addition the method produces mean or “average” levels representative of the other descriptors (LAeq, LA10, etc).

## 5 Tonality

Tonal noise contains one or more prominent tones (ie distinct frequency components), and is normally



Regarded as more offensive than “broad band” noise. 7. Impulsiveness

## 6 Impulsiveness

An impulsive noise is characterised by one or more short sharp peaks in the time domain, such as occurs during hammering.

## 7 Frequency Analysis

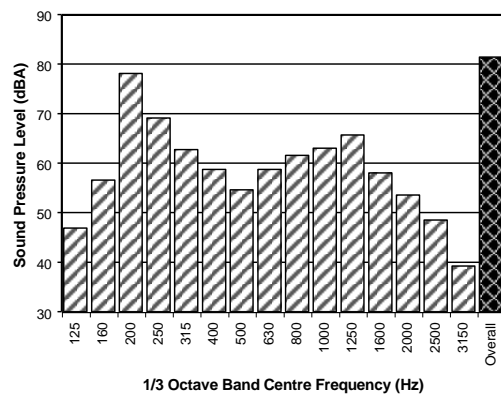
Frequency analysis is the process used to examine the tones (or frequency components) which make up the overall noise or vibration signal. This analysis was traditionally carried out using analogue electronic filters, but is now normally carried out using fast fourier transform (fft) analysers.

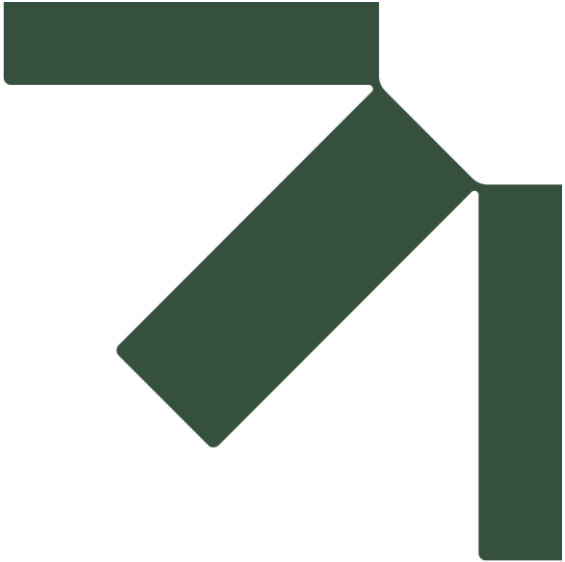
The units for frequency are hertz (hz), which represent the number of cycles per second.

Frequency analysis can be in:

- Octave bands (where the centre frequency and width of each band is double the previous band)
- 1/3 octave bands (3 bands in each octave band)
- Narrow band (where the spectrum is divided into 400 or more bands of equal width)

The following figure shows a 1/3 octave band frequency analysis where the noise is dominated by the 200 Hz band. Note that the indicated level of each individual band is less than the overall level, which is the logarithmic sum of the bands





# **Appendix B   Calibration Certificates**

## **Narrabri Mine Noise Monitoring**

**Quarter Ending March 2025 Summary Noise Report**

**Narrabri Coal Operations Pty Ltd**

SLR Project No.: 610.018063.00175

15 April 2025



Sydney Calibration Laboratory  
Unit 21, 1 Talavera Road, Macquarie Park NSW 2113, Australia  
Accredited for compliance with ISO/IEC 17025 - Calibration. Laboratory No. 1301



## CERTIFICATE OF CALIBRATION

Certificate No: CAU2400679

Page 1 of 11

### CALIBRATION OF:

|                      |                      |                   |             |
|----------------------|----------------------|-------------------|-------------|
| Sound Level Meter:   | Brüel & Kjær         | 2250              | No: 3005904 |
| Microphone:          | Brüel & Kjær         | 4950              | No: 2913815 |
| Preamplifier:        | Brüel & Kjær         | ZC-0032           | No: 20518   |
| Supplied Calibrator: | None                 |                   |             |
| Software version:    | BZ7130 Version 4.7.6 | Pattern Approval: | -           |
| Instruction manual:  | BE1853-11            | Identification:   | N/A         |

### CUSTOMER:

SLR Consulting Australia Pty Ltd  
202 Submarine School, Sub Base Platypus  
North Sydney NSW 2060

### CALIBRATION CONDITIONS:

Preconditioning: 4 hours at 23 °C  
Environment conditions: *see actual values in Environmental conditions sections*

### SPECIFICATIONS:

The Sound Level Meter has been calibrated in accordance with the requirements as specified in IEC61672-1:2013 class 1. Procedures from IEC 61672-3:2013 were used to perform the periodic tests. The measurements included in this document are traceable to Australian/International standards.

### PROCEDURE:

The measurements have been performed with the assistance of Brüel & Kjær Sound Level Meter Calibration System B&K 3630 with application software type 7763 (version 8.6 - DB: 8.60) and test procedure 2250-L-4950.

### RESULTS:

|   |                                       |  |  |
|---|---------------------------------------|--|--|
|   | Initial calibration                   |  | Calibration prior to repair/adjustment |
| X | Calibration without repair/adjustment |  | Calibration after repair/adjustment    |

The reported expanded uncertainty is based on the standard uncertainty multiplied by a coverage factor  $k = 2$  providing a level of confidence of approximately 95 %. The uncertainty evaluation has been carried out in accordance with EA-4/02 from elements originating from the standards, calibration method, effect of environmental conditions and any short time contribution from the device under calibration.

Date of Calibration: 05/07/2024

Certificate issued: 05/07/2024

Barath Chandar Rajendran  
Calibration Technician

Sajeel Tharayil  
Approved signatory

Reproduction of the complete certificate is allowed. Parts of the certificate may only be reproduced after written permission.





Sydney Calibration Laboratory  
Unit 21, 1 Talavera Road, Macquarie Park NSW 2113, Australia  
Accredited for compliance with ISO/IEC 17025 - Calibration. Laboratory No. 1301



## CERTIFICATE OF CALIBRATION

Certificate No: CAU2400840

Page 1 of 11

### CALIBRATION OF:

|                      |                      |                   |             |
|----------------------|----------------------|-------------------|-------------|
| Sound Level Meter:   | Brüel & Kjær         | 2270              | No: 3029485 |
| Microphone:          | Brüel & Kjær         | 4189              | No: 3260622 |
| Preamplifier:        | Brüel & Kjær         | ZC-0032           | No: 30123   |
| Supplied Calibrator: | None                 |                   |             |
| Software version:    | BZ7222 Version 4.7.6 | Pattern Approval: | -           |
| Instruction manual:  | BE1712-22            | Identification:   | N/A         |

### CUSTOMER:

SLR Consulting Australia Pty Ltd  
202 Submarine School, Sub Base Platypus  
North Sydney NSW 2060

### CALIBRATION CONDITIONS:

Preconditioning: 4 hours at 23 °C  
Environment conditions: *see actual values in Environmental conditions sections*

### SPECIFICATIONS:

The Sound Level Meter has been calibrated in accordance with the requirements as specified in IEC61672-1:2013 class 1. Procedures from IEC 61672-3:2013 were used to perform the periodic tests. The measurements included in this document are traceable to Australian / International standards through accredited calibration of all relevant reference equipment.

### PROCEDURE:

The measurements have been performed with the assistance of Brüel & Kjær Sound Level Meter Calibration System B&K 3630 with application software type 7763 (version 8.6 - DB: 8.60) and test procedure 2270-4189.

### RESULTS:

|   |                                       |  |  |
|---|---------------------------------------|--|--|
|   | Initial calibration                   |  | Calibration prior to repair/adjustment |
| X | Calibration without repair/adjustment |  | Calibration after repair/adjustment    |

The reported expanded uncertainty is based on the standard uncertainty multiplied by a coverage factor  $k = 2$  providing a level of confidence of approximately 95 %. The uncertainty evaluation has been carried out in accordance with EA-4/02 from elements originating from the standards, calibration method, effect of environmental conditions and any short time contribution from the device under calibration.

Date of Calibration: 29/08/2024

Certificate issued: 29/08/2024

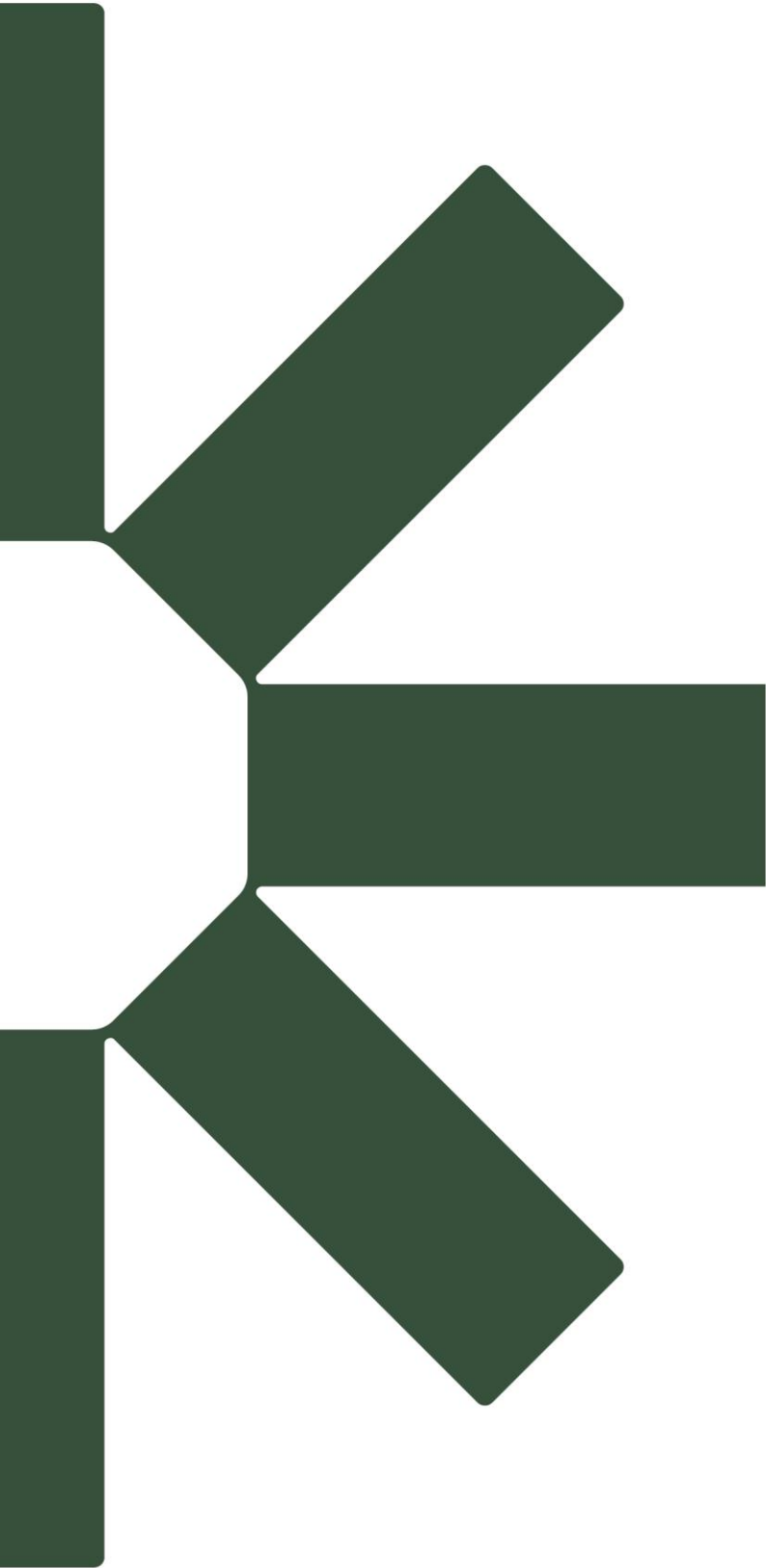
Barath Chandar Rajendran  
Calibration Technician

Sajeeb Tharayil  
Approved signatory

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