Stratford Mining Complex

Monthly Compliance Noise Monitoring – May 2025

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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 Stratford Coal 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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1.0 Introduction

Stratford Coal Pty Limited (SCPL), a wholly owned subsidiary of Yancoal Australia Limited (Yancoal), has commissioned SLR Consulting Australia Pty Ltd (SLR) to conduct monthly noise monitoring for the Stratford Mining Complex (SMC) operations guided by the requirements of the *Stratford Mining Complex (Stratford Extension Project) Noise Management Plan* (NMP), Document No. NMP-R04-A, dated 4 October 2022. This report presents the results and findings from the operator-attended noise surveys conducted across Wednesday 28 May 2025 to Thursday 29 May 2025.

Current operations at the SMC are now focused on the progressive rehandling of waste material to achieve the final landform design, following the completion of active mining.

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

- Conduct three rounds of external operator-attended noise measurements at the eight nominated locations in the NMP as well as additional locations, representative of receivers in the area surrounding the SMC. The eight external operator-attended noise measurement locations are:
    - Atkins – Off Wenhams Cox Road, Stratford
    - Clarke – Off Wenhams Cox Road, Stratford
    - Wadland – Off Wenhams Cox Road, Stratford
    - Hall – Upper Avon Road, Craven
    - Lowrey – Off Crowthers Road, Stratford
    - Pryce Jones – The Bucketts Way, Craven
    - Van der Drift – Wood Street, Stratford
    - Greenwood – Off Glen Road, Craven

Monitoring will align with the latest NMP (October 2022) once access to the proposed new monitoring site “Williams” has been granted and agreed upon. Monitoring at “Williams” will replace monitoring at “Clarke” and “Atkins” to better represent and determine compliance with receivers to the North-West. It is noted that monitoring locations “Clarke” and “Atkins” are currently being used, and will continue to be used until access to monitoring location “Williams” is granted.

Noise monitoring will occur for a day, evening and night period. The day, evening and night periods being those defined in the NSW Industrial Noise Policy (EPA 2000).

- The operator will quantify and characterise the maximum (LAmax) and the intrusive (L_{Aeq} and L_{Ceq}) noise level contributions from SMC operations over a 15 minute measurement period. In addition, the operator will quantify and characterise the overall levels of ambient noise (i.e. L_{Amax}, L_{A1}, L_{A10}, L_{A50}, L_{A90}, and L_{Aeq}) over the 15 minute measurement interval.
- Assess the noise emissions of SMC and determine compliance with respect to the limits contained in the NMP.

In addition to monthly noise monitoring at the nominated residential receivers, the NMP requires quarterly verification noise monitoring of the Real Time Noise Monitor (RTNM) network.

Prior to transitioning into mine closure in July 2024, the NMP also required quarterly noise monitoring of rail activity. The decommissioning of the SMC CHPP and associated rail

infrastructure has commenced. The last train railed from the SMC was in July 2024, hence no rail noise monitoring has been undertaken.

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

2.0 SMC Noise Criteria

The figures presented in this Section are extracts from the *Stratford Extension Project* (SSD-4966) Development Consent dated 14 January 2021.

2.1 Project Approval Schedule 3 Environmental Performance Conditions

ACQUISITION UPON REQUEST

1. Upon receiving a written request for acquisition from an owner of the land listed in Table 1, the Applicant shall acquire the land in accordance with the procedures in conditions 5-6 of Schedule 4.

Table 1: Land subject to acquisition upon request

Property ID	
40/51/Cr1 – L. Blanch	42 – D. Blanch
Cr7 – Pryce-Jones	Cr 2 – Boorer

Note: To interpret the location referred to in Table 1 see the applicable figure in Appendix 5.

However, the obligation to acquire a property does not apply if the Applicant has a negotiated agreement with the owner/s of the relevant land that sets aside acquisition under the terms of this consent, and the Applicant has advised the Department in writing of the terms of this agreement.

ADDITIONAL MITIGATION UPON REQUEST

2. Upon receiving a written request from the owner of any residence on the land listed in Tables 1 and 2, the Applicant shall implement additional noise mitigation measures (such as double glazing, insulation, and/or air conditioning) at the residence in consultation with the owner. These measures must be reasonable and feasible and directed towards reducing the noise impacts of the development on the residence.

If within 3 months of receiving this request from the owner, the Applicant and the owner cannot agree on the measures to be implemented, or there is a dispute about the implementation of these measures, then either party may refer the matter to the Secretary for resolution.

Table 2: Land subject to additional noise mitigation upon request

Property ID	***Property ID***
31(1) – Isaac	60 – Healy / Greenwood
44 – Cross / Jane	36 – Wallace
37 – Worth	29 – Ward
15(3) – Falla	

Note: To interpret the locations referred to in Table 2 see the applicable figure in Appendix 5.

However, the obligation to implement noise mitigation measures does not apply if the Applicant has a negotiated agreement with the owner/s of the relevant residence or land that sets aside noise mitigation measures under the terms of this consent, and the Applicant has advised the Department in writing of the terms of this agreement.

NOISE

Hours of Operation

3. The Applicant shall comply with the operating hours in Table 3.

Table 3: Operating hours

Activity	Operating Hours
• Open cut mining operations in the Bowens Road North and Roseville West Extension pits • Recovery and transport of CHPP rejects for re-processing • Construction of the noise mitigation bunds on the western side of the Avon North, Roseville West Extension and Stratford East pits	7 am to 6 pm, 7 days per week
• Open cut mining operations in the Avon North and Stratford East pits • Coal processing, loading and dispatch of product coal trains	24 hours a day, 7 days per
• Maintenance activities	week

Noise Criteria

4. The Applicant shall ensure that the noise generated by the development does not exceed the criteria in Table 4 at any residence on privately-owned land.

Table 4: Noise criteria dB(A)

Land	Day $L_{Aeq(15\ min)}$	Evening $L_{Aeq(15\ min)}$	Night $L_{Aeq(15\ min)}$	Night $L_{A1\ (1\ min)}$
40/51/Cr1 – L. Blanch	43	43	43	50
Cr7 – Pryce-Jones	43	43	43	49
42 – D. Blanch	42	42	42	50
Cr 2 – Boorer	41	41	41	49
31(1) – Isaac	40	40	40	48
36 – Wallace	39	39	39	47
44 – Cross / Jane				
60 – Healy / Greenwood	39	39	39	45
37 – Worth	38	38	38	46
29 – Ward	38	38	37	45
23 – Bagnall	37	37	37	45
31(2) – Isaac				
296 – Watson				
297 – Bosma				
298 – Yates	36	36	36	45
15(3) – Falla	39	35	35	45
15(2) – Falla	36	35	35	45
Stratford Village	37	36	35	45
All other privately-owned residences	35	35	35	45

- *To interpret the locations referred to in Table 4 see the applicable figure(s) in Appendix 5.*
- *Stratford village is shown on the figure(s) in Appendix 5.*

Noise generated by the development is to be measured in accordance with the relevant requirements of the *NSW Industrial Noise Policy*. Appendix 6 sets out the meteorological conditions under which these criteria apply and the requirements for evaluating compliance with these criteria.

However, these criteria do not apply if the Applicant has a negotiated agreement with the owner/s of the relevant residence or land to generate higher noise levels, and the Applicant has advised the Department in writing of the terms of this agreement.

2.2 Project Approval Appendix 6: Noise Compliance Assessment

Applicable Meteorological Conditions

1. The noise criteria in Table 4 in Schedule 3 are to apply to a receiver under all meteorological conditions except under:
   (a) wind speeds greater than 3 m/s at 10 m above ground level; or
   (b) temperature inversion conditions between 1.5°C and 3°C/100 m and wind speed greater than 2 m/s at 10 m above ground level; or
   (c) temperature inversion conditions greater than 3°C/100 m.

Determination of Meteorological Conditions

2. Except for wind speed at microphone height, the data to be used for determining meteorological conditions shall be that recorded by the meteorological station required under condition 25 of Schedule 3.

Compliance Monitoring

3. Attended monitoring is to be used to evaluate compliance with the relevant conditions of this consent.

4. This monitoring must be carried out at least 12 times in each calendar year (ie at least once in every calendar month), unless the Secretary directs otherwise.

5. Unless the Secretary agrees otherwise, this monitoring is to be carried out in accordance with the relevant requirements for reviewing performance set out in the *NSW Industrial Noise Policy* (as amended from time to time), in particular the requirements relating to:
   (a) monitoring locations for the collection of representative noise data;
   (b) equipment used to collect noise data, and conformity with Australian Standards relevant to such equipment;
   (c) modifications to noise data collected, including for the exclusion of extraneous noise and/or penalties for modifying factors apart from adjustments for duration; and
   (d) the use of an appropriate modifying factor for low frequency noise to be applied during compliance testing at any individual residence if low frequency noise is present (in accordance with the INP) and before comparison with the specified noise levels in the consent.

The implementation and transitional arrangements for the NSW Noise Policy for Industry (NPfI) notes the following:

> *The NSW Industrial Noise Policy (2000) will continue to apply where it is referenced in existing statutory instruments (such as consents and licences), except for the NSW Industrial Noise Policy Section 4 modifying factors, which will be transitioned to the Noise Policy for Industry (2017) Fact Sheet C through a NSW Industrial Noise Policy application note. This approach has been taken because the Noise Policy for Industry (2017) modification factor approach reflects more recent understanding of the impact of tonal and low-frequency noise on the community.*

As such appropriate modifying factors such as low frequency noise have been assessed against NPfI requirements.

2.3 EPL Noise Limits – SMC Operations

The noise limits specified in EPL 5161 are consistent with the noise criteria specified in SSD-4966.

2.4 Noise Limits at the Nominated Attended Noise Monitoring Locations

The site-specific noise limits for the eight nominated attended noise monitoring locations are summarised in **Table 1**.

Table 1 Noise Limits for the Nominated Noise Monitoring Locations

Locality	Intrusiveness Criteria $L_{Aeq(15minute)}$			Night Criterion $L_{A1(1minute)}$
	Day	Evening	Night	Night
Atkins[1,2]	35	35	35	45
Clarke[1,2]	37	37	37	45
Wadland[1,2]	37	37	37	45
Hall	35	35	35	45
Lowrey	35	35	35	45
Pryce Jones[3]	43	43	43	49
Van der Drift	37	36	35	45
Greenwood	35	35	35	45

Note 1: Owned by Stratford Coal Pty Ltd

Note 2: Criteria adopted from Bagnall as a guide only and are not definitive at this location.

Note 3: Land subject to acquisition upon request.

3.0 Operational Noise Monitoring Methodology

3.1 NMP Monitoring Requirements

Noise monitoring will occur for a day, evening and night period. The day, evening and night periods being those defined in the NSW *Industrial Noise Policy* (EPA 2000).

- The operator will quantify and characterise the maximum (L_{Amax}) and the intrusive (L_{Aeq} and L_{Ceq}) noise level contributions from SMC operations over a 15 minute measurement period. In addition, the operator will quantify and characterise the overall levels of ambient noise (i.e. L_{Amax}, L_{A1}, L_{A10}, L_{A50}, L_{A90}, and L_{Aeq}) over the 15 minute measurement interval.
- Assess the noise emissions of SMC and determine compliance with respect to the limits contained in the NMP.

Relevant modifying factors are assessed by analysis of the measured SMC L_{eq} spectrum where applicable.

3.2 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 ±0.5 dBA.

All operator-attended noise measurements were conducted using a one-third octave integrating Brüel & Kjær Type 2250L (s/n 3003389 and s/n 3005908) together with a Svantek SV30A acoustical calibrator (s/n 24518).

3.3 Operator-attended Noise Monitoring Locations

Noise monitoring was conducted in accordance with the requirements of the NMP.

Operator-attended noise measurements were conducted during the day, evening and night-time period for a minimum of 15 minutes per period at each of the eight noise monitoring locations. Additional noise monitoring at Wadland has been implemented to enable a robust acoustic relationship between the Clarke and Wadland monitoring locations and the Bagnall residence to the east.

The details of the operator-attended SMC operational noise monitoring locations are contained within **Table 2** and shown generally in **Figure 1**. During the operator-attended noise measurements, the character and relative contribution of ambient noise sources and SMC contributions were determined by observations on site.

Table 2 SMC Operational Noise Monitoring Locations

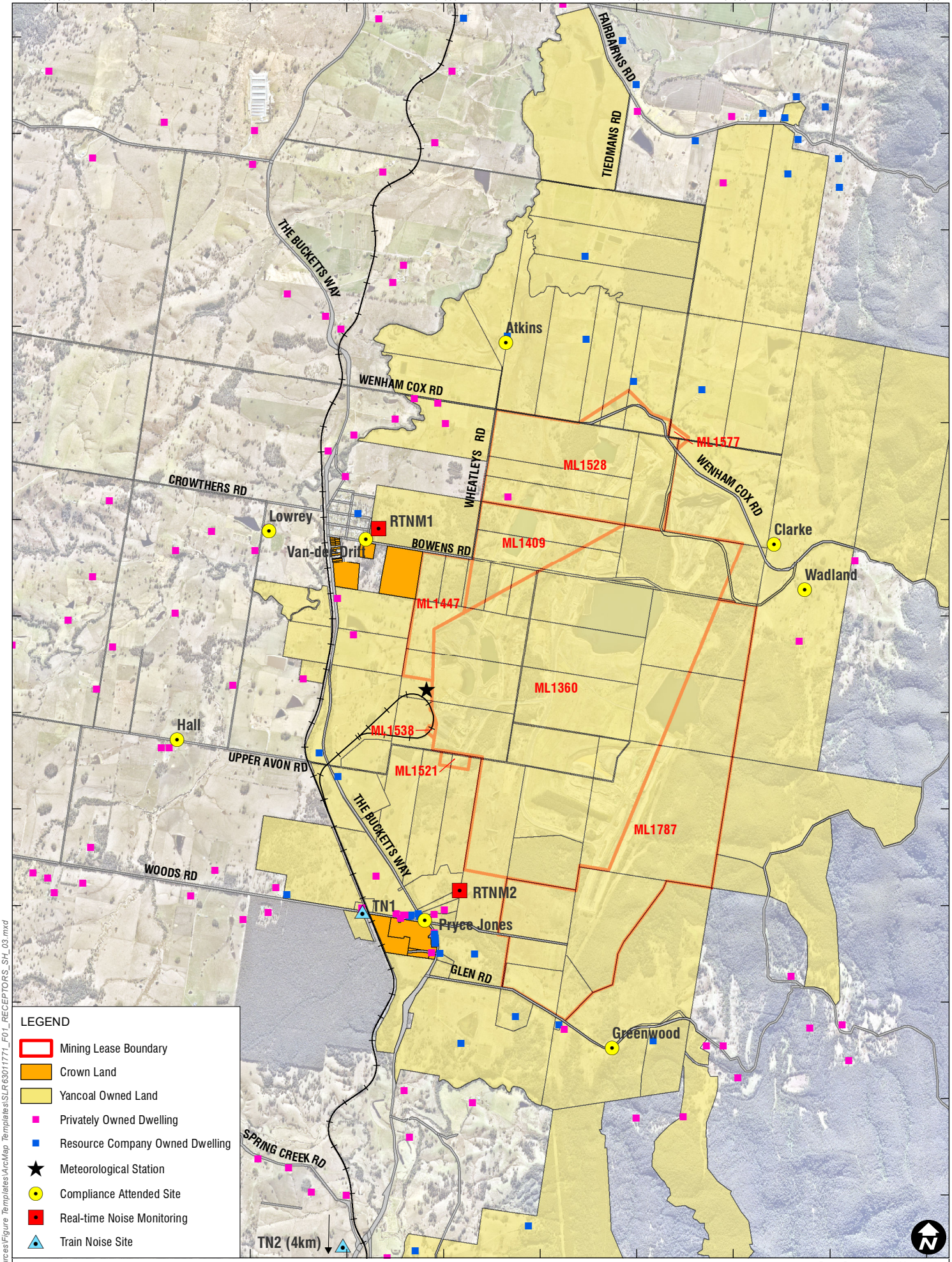
Monitoring Location	Receiver Type	Resident / Owner	Monitoring Location - MGA Zone 56	
			Easting (m)	Northing (m)
Atkins	Mine owned Residence	SCPL	401544	6447134
Clarke	Mine owned Residence	SCPL	404406	6445783
Wadland	Intermediate Monitoring Location	SCPL	404739	6445272
Hall	Residence	Hall	398269	6443709
Lowrey	Residence	Lowrey	399193	6445879
Pryce Jones	Residence	Pryce Jones	400807	6441846
Van der Drift	Residence	SCPL	400171	6445775
Greenwood	Residence	Greenwood	402617	6440457

3.4 Extrapolation Methodology for Intermediate Monitoring Locations

The NPfI provides the most contemporary advice on compliance assessment techniques for industrial noise assessment. The NPfI provides a direct commentary on the use of 'alternative or intermediate' locations to determine compliance as follows:

> ***Direct measurement at alternative or intermediate location/s***
>
> *Where direct measurement of noise at a compliance location is not practical because of poor signal-to-noise ratios (that is, extraneous noise is louder than the noise under investigation), or where access to the location has been denied or is unavailable, measurements at intermediate locations between the source and the receiver location, where signal-to-noise ratios are higher, may be a viable option. For this approach to be effective there needs to be well-established theoretical and/or empirical relationships between the intermediate location and the receiver location in terms of noise exposure. Noise modelling may be one option to establish this relationship. The techniques under the above section 'Direct measurement at a receiver location' would also be relevant in terms of quantifying the level of noise from the source at the intermediate location(s). Where this technique is relied upon, it is the responsibility of the proponent to demonstrate a robust acoustic relationship between the compliance location and the intermediate location.*

As such an ENM noise model of typical site operations is used to predict noise levels at the Bagnall residence for all monitoring periods. The noise model is calibrated using the operator attended noise monitoring results (where available) and weather conditions at the time of the Clarke and Wadland noise monitoring.



Scale: 1:50,000 at A4
Coordinate System: GDA 1994 MGA Zone 56

Date Drawn: 17-Nov-2023
Project Number: 630.11771

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SLR

NOISE MONITORING LOCATIONS

FIGURE 1

3.5 Compliance Assessment Protocol

In accordance with the NMP the results of noise monitoring at the compliance attended monitoring sites will be compared against the relevant noise criteria. The comparison will be undertaken following the exclusion of data where meteorological conditions are outside those provided in Appendix 6 of SSD-4966 and extraneous noise sources.

If SMC related noise contributions exceed the noise criteria under applicable meteorological conditions, then in accordance with the NMP:

- The exceedance will be reported to the Operations Manager;
- A second reading will be undertaken at the location within 75 minutes; and
- The exceedance will be reported in the Monthly Environmental Monitoring Report and Annual Review.

If the second reading is also confirmed to exceed the relevant criteria, then:

- The sustained exceedance will be deemed to be a noise incident;
- The noise incident will be reported to DPHI and EPA as a non-compliance in accordance with Section 10 of the NMP;
- Follow up monitoring will be conducted at the location within one week of the recorded non-compliance; and
- The non-compliance and the outcome of the follow-up monitoring will be reported in the Monthly Environmental Monitoring Report and Annual Review.

A confirmed noise incident (i.e. sustained exceedance and non-compliance) as determined by attended noise monitoring will be deemed to be a breach of the noise criteria.

4.0 Results

4.1 Operator-attended Noise Monitoring – SMC Operational Activity

Operator-attended noise measurements were conducted across Wednesday 28 May 2025 to Thursday 29 May 2025. Results of the operator-attended noise surveys at residential locations are provided in **Sections 4.1.1 to 4.1.7.**

A summary of the results for the attended noise monitoring are displayed graphically in **Appendix B** showing L_{Amax}, L_{Aeq}, and $L_{Aeq(<1.25kHz)}$ in 1-second intervals throughout the monitoring survey.

Ambient noise levels presented include all noise sources such as transport (roads, rail and aircraft), fauna (insects, frogs, birds, and bats), farm animals (cows, bulls), the natural environment (wind, wind in trees), domestic noises, other industrial operations as well as SMC noise emissions. Weather data during the monitoring period has been obtained from the weather station located on the SMC site.

The tables below provide the following information on operator-attended noise surveys:

- Date and start time, operator and equipment details.
- Monitoring location.
- Wind velocity (m/s) and temperature (ºC) at the measurement location.
- Typical maximum (L_{Amax}) and contributed $L_{Aeq(15minute)}$ noise levels.

4.1.1 Operator-attended Noise Survey Results – 'Atkins'

Results of the operator-attended noise surveys at 'Atkins' are provided in **Table 3**. Monitoring location 'Atkins' represents residential receptors located to the north of the site. Due to access issues, monitoring during this quarter at this location was conducted closer to SMC at the Atkins property boundary.

Table 3 Operator-attended Noise Survey Results – 'Atkins'

Period	Date/ Start Time/ Weather	Primary Noise Descriptor (15minute) (dBA)						Modifying Factors Applicable	Description of Noise Emissions and Typical Maximum Noise Levels (dBA)
		L_{Amax}	L_{A1}	L_{A10}	L_{A90}	L_{Aeq}	L_{Aeq} (≤1.25kHz)		
Day	28/05/2025 11:07 18°C 4.4m/s WSW	64	53	47	36	44	41	N/A	*Site related noise events:* **SMC: Inaudible** *Other noise events:* Birdsong 43-63 Traffic noise 51 Aeroplane 64 Wind in trees 40-51
Evening	28/05/2025 20:44 8°C 0.4m/s S 5.8°C/100m	44	39	35	29	32	31	N/A	*Site related noise events:* **SMC: Audible** SMC Ops 28-38 **$L_{Aeq(15minute)}$ contribution 30 dBA** *Other noise events:* Insect/frog noise <30 Traffic noise 30-45 Extraneous 41-43
Night	28/05/2025 22:46 7°C 1.7m/s N 8.3°C/100m	47	46	43	36	40	40	N/A	*Site related noise events:* **SMC: Audible** SMC Ops 36-47 **$L_{Aeq(15minute)}$ contribution 40 dBA** **$L_{A1(1minute)}$ 47 dBA** *Other noise events:* Insect/frog noise <30 Livestock 40-42

Note: N/A = Not Applicable due to non-compliant weather conditions and/or SMC being inaudible or 5 dB or more below the noise criteria.

SMC operations were inaudible during the day and audible during the evening and night-time periods of the operator attended noise surveys at this location. During the evening, and night-time, operator attended noise surveys, SMC operations generated an $L_{Aeq(15minute)}$ noise contribution of 30 dBA, and 40 dBA respectively. During the night-time, SMC generated an $L_{A1(1minute)}$ noise contribution of up to 47 dBA.

Meteorological data from the onsite SMC automatic weather station showed wind speeds in excess of 3.0m/s during the day period and lapse rates in excess of 3.0°C/100m during the evening and night-time periods of the operator attended measurements at this location. As such, the criteria during these periods at this location is not applicable.

4.1.2 Operator-attended Noise Survey Results – 'Clarke' and 'Wadland'

Results of the operator-attended noise surveys at 'Clarke' and Wadland are provided **Table 4**. These monitoring locations represent residential receptors located to the east of the site and are SMC owned properties. The monitoring results at Clarke and Wadland, under appropriate meteorological conditions, are used to determine SMC contributions at the 'Bagnall' residence located further to the east.

Table 4 Operator-attended Noise Survey Results – 'Clarke' and 'Wadland'

Period	Date/ Start Time/ Weather	Primary Noise Descriptor (15minute) (dBA)						Modifying Factors Applicable	Description of Noise Emissions and Typical Maximum Noise Levels (dBA)
		L_{Amax}	L_{A1}	L_{A10}	L_{A90}	L_{Aeq}	L_{Aeq} (≤1.25kHz)		
Day - Clarke	28/05/2025 10:29 17°C 4.4m/s SW	57	49	43	35	40	39	N/A	*Site related noise events:* **SMC: Audible** SMC Ops 35-44 **$L_{Aeq(15minute)}$ contribution 37 dBA** *Other noise events:* Birdsong 38-57 Aeroplane 53
Day - Wadland	28/05/2025 10:47 17°C 4.6m/s WSW	65	51	48	38	45	40	N/A	*Site related noise events:* **SMC: Audible** SMC Ops 30-37 **$L_{Aeq(15minute)}$ contribution 33 dBA** *Other noise events:* Birdsong 65 Livestock 45 Wind in trees 35-50
Evening - Clarke	28/05/2025 21:10 8°C 0.9m/s SSW 6.0°C/100m	49	47	45	39	43	43	N/A	*Site related noise events:* **SMC: Audible** SMC Ops 35-49 **$L_{Aeq(15minute)}$ contribution 43 dBA** *Other noise events:* Insect/frog noise 27-31
Evening - Wadland	28/05/2025 21:45 5°C 1.7m/s SW 8.3°C/100m	49	48	44	39	42	41	N/A	*Site related noise events:* **SMC: Audible** SMC Ops 35-49 **$L_{Aeq(15minute)}$ contribution 41 dBA** *Other noise events:* Insect/frog noise 39-44

Period	Date/ Start Time/ Weather	Primary Noise Descriptor (15minute) (dBA)						Modifying Factors Applicable	Description of Noise Emissions and Typical Maximum Noise Levels (dBA)
		L_{Amax}	L_{A1}	L_{A10}	L_{A90}	L_{Aeq}	L_{Aeq} (≤1.25kHz)		
Night - Clarke	28/05/2025 22:24 6°C 1.1m/s S 10.3°C/100m	49	48	47	39	44	44	No	*Site related noise events:* **SMC: Audible** SMC Ops 39-49 **$L_{Aeq(15minute)}$ contribution 44 dBA** **$L_{A1(1minute)}$ 49 dBA** *Other noise events:* Insect/frog noise 26-35
Night - Wadland	28/05/2025 22:00 8°C 1.4m/s SSW 9.0°C/100m	49	47	46	38	42	41	No	*Site related noise events:* **SMC: Audible** SMC Ops 37-48 **$L_{Aeq(15minute)}$ contribution 41 dBA** **$L_{A1(1minute)}$ 48 dBA** *Other noise events:* Insect/frog noise 39-43 Livestock 44-49

Note: N/A = Not Applicable due to non-compliant weather conditions and/or SMC being inaudible or 5 dB or more below the noise criteria.

At Clarke, SMC operations were audible during all periods of the operator attended noise surveys. During the day, evening, and night-time operator attended noise surveys, SMC operations generated an $L_{Aeq(15minute)}$ noise contribution of 37 dBA, 43 dBA, and 44 dBA respectively. During the night-time, SMC generated an $L_{A1(1minute)}$ noise contribution of up to 49 dBA.

Meteorological data from the onsite SMC automatic weather station showed wind speeds in excess of 3.0m/s during the day period and lapse rates in excess of 3.0°C/100m during the evening and night-time periods of the operator attended measurements at this location. As such, the criteria during these periods at this location is not applicable.

At Wadland, SMC operations were audible during all periods of the operator attended noise surveys. During the day, evening, and night-time operator attended noise surveys, SMC operations generated an $L_{Aeq(15minute)}$ noise contribution of 33 dBA, 41 dBA, and 41 dBA respectively. During the night-time, SMC generated an $L_{A1(1minute)}$ noise contribution of up to 48 dBA.

Meteorological data from the onsite SMC automatic weather station showed wind speeds in excess of 3.0m/s during the day period and lapse rates in excess of 3.0°C/100m during the evening and night-time periods of the operator attended measurements at this location. As such, the criteria during these periods at this location is not applicable.

Noise modelling has been conducted to the Bagnall residence using an ENM model for all monitoring periods. The results of the noise modelling are provided **Table 5.**

Table 5 Predicted Noise Levels – Bagnall

Period and Location	Meteorological Parameters	Noise Level at Monitoring Location $L_{Aeq(15minute)}$	Predicted Noise Level at Bagnall $L_{Aeq(15minute)}$	Propagation Attenuation – Monitoring Location to Bagnall (dB)
Day – Clarke	Temp 17°C Humidity 53% Wind Speed 4.4m/s Wind Direction 243° Lapse Rate -1.3°C/100m	37 dBA	27 dBA	10.1 dB
Day – Wadland	Temp 17°C Humidity 52% Wind Speed 4.6m/s Wind Direction 249° Lapse Rate -1.4°C/100m	33 dBA	32 dBA	1.5 dB
Evening – Clarke	Temp 8°C Humidity 90% Wind Speed 0.9m/s Wind Direction 223° Lapse Rate 6.0°C/100m	43 dBA	34 dBA	9.1 dB
Evening – Wadland	Temp 5°C Humidity 90% Wind Speed 1.7m/s Wind Direction 225° Lapse Rate 8.3°C/100m	41 dBA	39 dBA	2.3 dB
Night – Clarke	Temp 6°C Humidity 91% Wind Speed 1.1m/s Wind Direction 196° Lapse Rate 10.3°C/100m	44 dBA	33 dBA	11.0 dB
		49 dBA L_{Amax}	38 dBA L_{Amax}	
Night – Wadland	Temp 8°C Humidity 91% Wind Speed 1.4m/s Wind Direction 206° Lapse Rate 9.0°C/100m	41 dBA	39 dBA	1.9 dB
		48 dBA L_{Amax}	46 dBA L_{Amax}	

Note: I/A = Inaudible.

At Bagnall, during the day, evening, and night-time operator attended noise surveys, SMC operations are predicted to generate an $L_{Aeq(15minute)}$ noise contribution of up to 32 dBA, 39 dBA, and 39 dBA respectively. During the night-time, SMC operations are predicted to generate an L_{Amax} noise contribution of up to 46 dBA at Bagnall.

Meteorological data from the onsite SMC automatic weather station showed wind speeds in excess of 3.0m/s during the day period and lapse rates in excess of 3.0°C/100m during the evening and night-time periods of the operator attended measurements at this location. As such, the criteria during these periods at this location is not applicable.

4.1.3 Operator-attended Noise Survey Results – 'Hall'

Results of the operator-attended noise surveys at 'Hall' are provided in **Table 6**. Monitoring location 'Hall' represents residential receptors located to the southwest of the site.

Table 6 Operator-attended Noise Survey Results – 'Hall'

Period	Date/ Start Time/ Weather	Primary Noise Descriptor (15minute) (dBA)						Modifying Factors Applicable	Description of Noise Emissions and Typical Maximum Noise Levels (dBA)
		L_{Amax}	L_{A1}	L_{A10}	L_{A90}	L_{Aeq}	L_{Aeq} (≤1.25kHz)		
Day	28/05/2025 12:00 18°C 4.8m/s WSW	80	57	42	29	51	50	N/A	*Site related noise events:* **SMC: Inaudible** *Other noise events:* Birdsong 40-58 Traffic noise 75-80 Wind in trees 34-52
Evening	28/05/2025 19:14 10°C 1.3m/s NE 3.7°C/100m	57	54	42	30	41	40	No	*Site related noise events:* **SMC: Audible** SMC Ops 25-27 **$L_{Aeq(15minute)}$ contribution 26 dBA** *Other noise events:* Insect/frog noise 28-31 Traffic noise 30-57 Livestock 30-46 Residential noise 37-39 Extraneous 42
Night	29/05/2025 00:01 7°C 1.4m/s NE 4.1°C/100m	44	38	34	29	32	28	N/A	*Site related noise events:* **SMC: Audible** SMC Ops 24-30 **$L_{Aeq(15minute)}$ contribution 27 dBA** **L_{Amax} 30 dBA** *Other noise events:* Insect/frog noise 27-36 Livestock 28-42 Dog barking 33-44

Note: N/A = Not Applicable due to non-compliant weather conditions and/or SMC being inaudible or 5 dB or more below the noise criteria.

SMC operations were inaudible during the day and audible during the evening and night-time periods of the operator attended noise surveys at this location. During the evening, and night-time, operator attended noise surveys, SMC operations generated an $L_{Aeq(15minute)}$ noise contribution of 26 dBA, and 27 dBA respectively. During the night-time, SMC generated an L_{Amax} noise contribution of up to 30 dBA.

Meteorological data from the onsite SMC automatic weather station showed wind speeds in excess of 3.0m/s during the day period and lapse rates in excess of 3.0°C/100m during the evening and night-time periods of the operator attended measurements at this location. As such, the criteria during these periods at this location is not applicable.

4.1.4 Operator-attended Noise Survey Results – 'Lowrey'

Results of the operator-attended noise surveys at 'Lowrey' are provided in **Table 7**. Monitoring location 'Lowrey' represents residential receptors located to the west of the site and west of Bucketts Way.

Table 7 Operator-attended Noise Survey Results – 'Lowrey'

Period	Date/ Start Time/ Weather	Primary Noise Descriptor (15minute) (dBA)						Modifying Factors Applicable	Description of Noise Emissions and Typical Maximum Noise Levels (dBA)
		L_{Amax}	L_{A1}	L_{A10}	L_{A90}	L_{Aeq}	L_{Aeq} (≤1.25kHz)		
Day	28/05/2025 09:55 17°C 2.2m/s NNW	63	50	44	34	41	39	N/A	*Site related noise events:* **SMC: Inaudible** *Other noise events:* Insect/frog noise 38-51 Birdsong 41-57 Traffic noise 38-44 Extraneous 63
Evening	28/05/2025 20:03 9°C 1.0m/s WNW 6.5°C/100m	51	48	44	33	40	39	N/A	*Site related noise events:* **SMC: Audible** SMC Ops 28-34 **$L_{Aeq(15minute)}$ contribution 33 dBA** *Other noise events:* Insect/frog noise 32-50 Dog barking 30-36 Traffic noise 30-51
Night	28/05/2025 23:36 5°C 1.4m/s N 7.3°C/100m	53	44	38	34	37	36	N/A	*Site related noise events:* **SMC: Audible** SMC Ops 28-36 **$L_{Aeq(15minute)}$ contribution 31 dBA** **L_{Amax} 36 dBA** *Other noise events:* Insect/frog noise 33-51 Dog barking 35-43

Note: N/A = Not Applicable due to non-compliant weather conditions and/or SMC being inaudible or 5 dB or more below the noise criteria.

SMC operations were inaudible during the day and audible during the evening and night-time periods of the operator attended noise surveys at this location. During the evening, and night-time, operator attended noise surveys, SMC operations generated an $L_{Aeq(15minute)}$ noise contribution of 33 dBA, and 31 dBA respectively. During the night-time, SMC generated an L_{Amax} noise contribution of up to 36 dBA.

Meteorological data from the onsite SMC automatic weather station showed lapse rates in excess of 3.0°C/100m during the evening and night-time periods of the operator attended measurements at this location. As such, the criteria during these periods at this location is not applicable.

4.1.5 Operator-attended Noise Survey Results – 'Pryce-Jones'

Results of the operator-attended noise surveys at 'Pryce-Jones' are provided in **Table 8.** Monitoring location 'Pryce Jones' represents residential receptors located in Craven to the south of the site.

Table 8 Operator-attended Noise Survey Results – 'Pryce-Jones'

Period	Date/ Start Time/ Weather	Primary Noise Descriptor (15minute) (dBA)						Modifying Factors Applicable	Description of Noise Emissions and Typical Maximum Noise Levels (dBA)
		L_{Amax}	L_{A1}	L_{A10}	L_{A90}	L_{Aeq}	L_{Aeq} (≤1.25kHz)		
Day	28/05/2025 12:20 18°C 4.2m/s SW	72	66	56	38	54	52	N/A	*Site related noise events:* **SMC: Inaudible** *Other noise events:* Birdsong 41-53 Traffic noise 54-72 Wind in trees 39-45
Evening	28/05/2025 18:50 10°C 0.7m/s E	74	68	56	40	55	54	N/A	*Site related noise events:* **SMC: Audible in lulls** SMC Ops 34-38 **$L_{Aeq(15minute)}$ contribution 35 dBA** *Other noise events:* Insect/frog noise 38-44 Birdsong 44-47 Traffic noise 36-75 Water run-off 35
Night	29/05/2025 00:24 7°C 1.3m/s NNE 4.6°C/100m	71	56	42	38	46	45	N/A	*Site related noise events:* **SMC: Barely audible** SMC Ops 31-32 **$L_{Aeq(15minute)}$ contribution 31 dBA** **L_{Amax} 32 dBA** *Other noise events:* Insect/frog noise 38-41 Birdsong 47-51 Traffic noise 33-71 Water run-off <35

Note: N/A = Not Applicable due to non-compliant weather conditions and/or SMC being inaudible or 5 dB or more below the noise criteria.

SMC operations were inaudible during the day and audible during the evening and night-time periods of the operator attended noise surveys at this location. During the evening, and night-time, operator attended noise surveys, SMC operations generated an $L_{Aeq(15minute)}$ noise contribution of 35 dBA, and 31 dBA respectively. During the night-time, SMC generated an L_{Amax} noise contribution of up to 32 dBA.

Meteorological data from the onsite SMC automatic weather station showed wind speeds in excess of 3.0m/s during the day period and lapse rates in excess of 3.0°C/100m during the night-time period of the operator attended measurements at this location. As such, the criteria during these periods at this location is not applicable.

4.1.6 Operator-attended Noise Survey Results – 'Van der Drift'

Results of the operator-attended noise surveys at 'Van der Drift' are provided in **Table 9**.

Table 9 Operator-attended Noise Survey Results – 'Van der Drift'

Period	Date/ Start Time/ Weather	Primary Noise Descriptor (15minute) (dBA)						Modifying Factors Applicable	Description of Noise Emissions and Typical Maximum Noise Levels (dBA)
		L_{Amax}	L_{A1}	L_{A10}	L_{A90}	L_{Aeq}	L_{Aeq} (≤1.25kHz)		
Day	28/05/2025 11:37 18°C 4.2m/s WSW	57	56	52	41	48	44	N/A	*Site related noise events:* **SMC: Inaudible** *Other noise events:* Birdsong 52 Traffic noise 34-42 Wind in trees 37-57
Evening	28/05/2025 19:38 10°C 0.7m/s WNW 7.6°C/100m	54	47	39	31	37	36	No	*Site related noise events:* **SMC: Audible** SMC Ops 28-32 **$L_{Aeq(15minute)}$ contribution 30 dBA** *Other noise events:* Insect/frog noise 32-38 Dog barking 44-54 Traffic noise 33-51 Residential noise 33-53
Night	28/05/2025 23:13 7°C 1.4m/s N 7.9°C/100m	50	48	40	32	37	31	N/A	*Site related noise events:* **SMC: Audible** SMC Ops 32-35 **$L_{Aeq(15minute)}$ contribution 31 dBA** **L_{Amax} 35 dBA** *Other noise events:* Insect/frog noise <30 Dog barking 35-39 Livestock 42-53 Traffic noise 33-41

Note: N/A = Not Applicable due to non-compliant weather conditions and/or SMC being inaudible or 5 dB or more below the noise criteria.

SMC operations were inaudible during the day and audible during the evening and night-time periods of the operator attended noise surveys at this location. During the evening, and night-time, operator attended noise surveys, SMC operations generated an $L_{Aeq(15minute)}$ noise contribution of 30 dBA, and 31 dBA respectively. During the night-time, SMC generated an L_{Amax} noise contribution of up to 35 dBA.

Meteorological data from the onsite SMC automatic weather station showed wind speeds in excess of 3.0m/s during the day period and lapse rates in excess of 3.0°C/100m during the evening and night-time periods of the operator attended measurements at this location. As such, the criteria during these periods at this location is not applicable.

4.1.7 Operator-attended Noise Survey Results – 'Greenwood'

Results of the operator-attended noise surveys at 'Greenwood' are provided in **Table 10**.

Table 10 Operator-attended Noise Survey Results – 'Greenwood'

Period	Date/ Start Time/ Weather	Primary Noise Descriptor (15minute) (dBA)						Modifying Factors Applicable	Description of Noise Emissions and Typical Maximum Noise Levels (dBA)
		L_{Amax}	L_{A1}	L_{A10}	L_{A90}	L_{Aeq}	L_{Aeq} (≤1.25kHz)		
Day	28/05/2025 12:42 18°C 4.2m/s SW	67	50	46	33	42	36	N/A	*Site related noise events:* **SMC: Inaudible** *Other noise events:* Birdsong 35-42 Livestock 38-67 Wind in trees 33-51
Evening	28/05/2025 18:27 11°C 0.5m/s NNW	49	38	34	31	33	29	N/A	*Site related noise events:* **SMC: Inaudible** *Other noise events:* Insect/frog noise 30-35 Dog barking 27-29 Traffic noise 25-41 Water run-off 26 Extraneous 42-48
Night	29/05/2025 00:48 7°C 0.8m/s NE 6.1°C/100m	43	36	33	30	32	27	N/A	*Site related noise events:* **SMC: Inaudible** *Other noise events:* Insect/frog noise 30-41 Water run-off 26-28 Extraneous 41-43

Note: N/A = Not Applicable due to non-compliant weather conditions and/or SMC being inaudible or 5 dB or more below the noise criteria.

SMC operations were inaudible during all periods of the operator attended noise surveys at this location.

Meteorological data from the onsite SMC automatic weather station showed wind speeds in excess of 3.0m/s during the day period and lapse rates in excess of 3.0°C/100m during the night-time period of the operator attended measurements at this location. As such, the criteria during these periods at this location is not applicable.

5.0 Performance Assessment

Results of the operator-attended noise measurements compared with the relevant noise criteria contained in the SMC Development Consent are given in **Table 11**.

Table 11 Performance Assessment – Operations

Location	Estimated SMC Noise Level $L_{Aeq(15minute)}$ (dBA)			Noise Criteria $L_{Aeq(15minute)}$ (dBA)			Compliance		
	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night
Atkins[2,4]	I/A[1]	30	40	35	35	35	Yes[4,5]	Yes[4,5]	Yes[4,5]
Clarke[2,4]	37	43	44	37	37	37	Yes[4,5]	Yes[4,5]	Yes[4,5]
Wadland[2,4]	33	41	41	37	37	37	Yes[4,5]	Yes[4,5]	Yes[4,5]
Bagnall[3]	32	39	39	37	37	37	Yes[3,5]	Yes[3,5]	Yes[3,5]
Hall	I/A[1]	26	27	35	35	35	Yes[5]	Yes[5]	Yes[5]
Lowrey	I/A[1]	33	31	35	35	35	Yes	Yes[5]	Yes[5]
Pryce-Jones	I/A[1]	35	31	43	43	43	Yes[5]	Yes	Yes[5]
Van der Drift	I/A[1]	30	31	37	36	35	Yes[5]	Yes[5]	Yes[5]
Greenwood	I/A[1]	I/A[1]	I/A[1]	35	35	35	Yes[5]	Yes	Yes[5]

Note 1: I/A = Inaudible.
Note 2: Owned by Stratford Coal Pty Ltd.
Note 3: Modelled result.
Note 4: Criteria adopted as a guide only.
Note 5: Criteria not applicable due to non-compliant weather conditions.

6.0 Sleep Disturbance

Results of the night period sleep disturbance measurements compared with the relevant noise criteria contained in the Development Consent are given in **Table 12**.

Table 12 Performance Assessment – Sleep Disturbance

Location	Estimated SMC Noise Level $L_{A1(1minute)}$ (dBA)	Noise Criteria $L_{A1(1minute)}$ (dBA)	Compliance
Atkins[2,4]	47	45	Yes[4,5]
Clarke[2,4]	49	45	Yes[4,5]
Wadland[2,4]	48	45	Yes[4,5]
Bagnall[3]	46	45	Yes[3,5]
Hall	30	45	Yes[5]
Lowrey	36	45	Yes[5]
Pryce Jones	32	49	Yes[5]
Van der Drift	35	45	Yes[5]
Greenwood	I/A[1]	45	Yes[5]

Note 1: I/A = Inaudible.
Note 2: Owned by Stratford Coal Pty Ltd.
Note 3: Modelled result.
Note 4: Criteria adopted as a guide only.
Note 5: Criteria not applicable due to non-compliant weather conditions.

7.0 Conclusion

SLR was engaged by Stratford Coal Pty Limited to conduct monthly noise monitoring for the Stratford Mining Complex (SMC) operations guided by the requirements of the *Stratford Mining Complex Noise Management Plan* (NMP), Document No. NMP-R04-A, dated 4 October 2022.

Operator-attended noise monitoring was conducted at eight residential receiver locations. Monitoring was completed across Wednesday 28 May 2025 to Thursday 29 May 2025 in order to determine the noise performance of the SMC operations against the Development Consent conditions.

Based on the measured SMC noise contribution, compliance with the relevant operational noise criteria was achieved at all noise monitoring locations during the day, evening and night monitoring periods under applicable weather conditions.

Based on the measured SMC noise contribution, compliance with the relevant sleep disturbance noise criteria was achieved at all privately owned noise monitoring locations during the night-time noise monitoring period under applicable weather conditions.

Appendix A Glossary of Acoustic Terminology

Stratford Mining Complex

Monthly Compliance Noise Monitoring – May 2025

Stratford Coal Pty Ltd

SLR Project No.: 630.031384.00001

25 August 2025

1. Sound Level or Noise Level

The terms 'sound' and 'noise' are almost interchangeable, except that 'noise' often refers to unwanted sound.

Sound (or noise) consists of minute fluctuations in atmospheric pressure. the human ear responds to changes in sound pressure over a very wide range with the loudest sound pressure to which the human ear can respond being 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 x 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 4,000 Hz), and less sensitive at lower and higher frequencies. Different sources having the same dBA level generally sound about equally loud.

A change of 1 dB or 2 dB in the level of a sound is difficult for most people to detect, whilst a 3 dB to 5 dB change corresponds to a small but noticeable change in loudness. A 10 dB 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

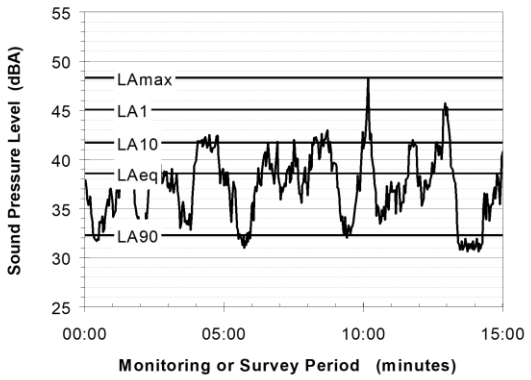
The Sound Power of a source is the rate at which it emits acoustic energy. As with Sound Pressure Levels, Sound Power Levels are expressed in decibel units (dB or dBA), but may be identified by the symbols SWL or LW, or by the reference unit 10^{-12} W.

the relationship between Sound Power and Sound Pressure is similar to the effect of 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:

L_{A1} The noise level exceeded for 1% of the 15 minute interval.

L_{A10} The noise level exceeded for 10% of the 15 minute interval. This is commonly referred to as the average maximum noise level.

L_{A90} 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.

L_{Aeq} 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.

5. Frequency Analysis

Frequency analysis is the process used to examine the tones (or frequency components) which make up the overall noise or vibration signal.

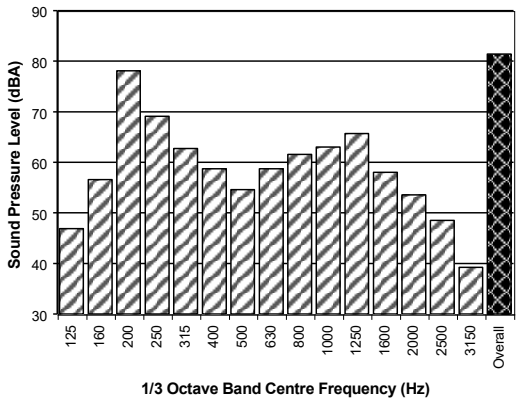
The units for frequency are Hertz (Hz), which represent the number of cycles per second.

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 (three 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.



6. Annoying Noise (Special Audible Characteristics)

A louder noise will generally be more annoying to nearby receivers than a quieter one. However, noise is often also found to be more annoying and result in larger impacts where the following characteristics are apparent:

- **Tonality** - tonal noise contains one or more prominent tones (ie differences in distinct frequency components between adjoining octave or 1/3 octave bands), and is normally regarded as more annoying than 'broad band' noise.
- **Impulsiveness** - an impulsive noise is characterised by one or more short sharp peaks in the time domain, such as occurs during hammering.
- **Intermittency** - intermittent noise varies in level with the change in level being clearly audible. An example would include mechanical plant cycling on and Off.
- **Low Frequency Noise** - low frequency noise contains significant energy in the lower frequency bands, which are typically taken to be in the 10 to 160 Hz region.

Appendix B Operator Attended Noise Survey Charts

Stratford Mining Complex

Monthly Compliance Noise Monitoring – May 2025

Stratford Coal Pty Ltd

SLR Project No.: 630.031384.00001

25 August 2025

Figure B1 – Day Period – 'Atkins' Operator Attended Noise Survey Results

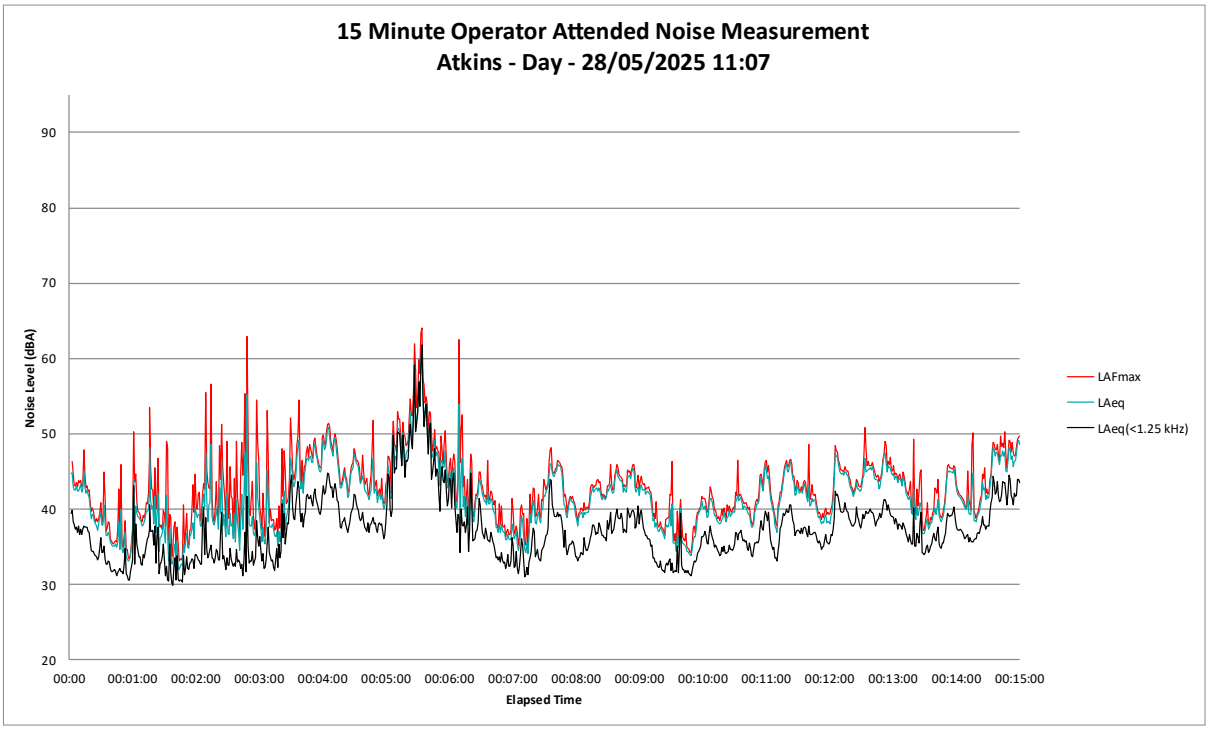


Figure B2 – Evening Period – 'Atkins' Operator Attended Noise Survey Results

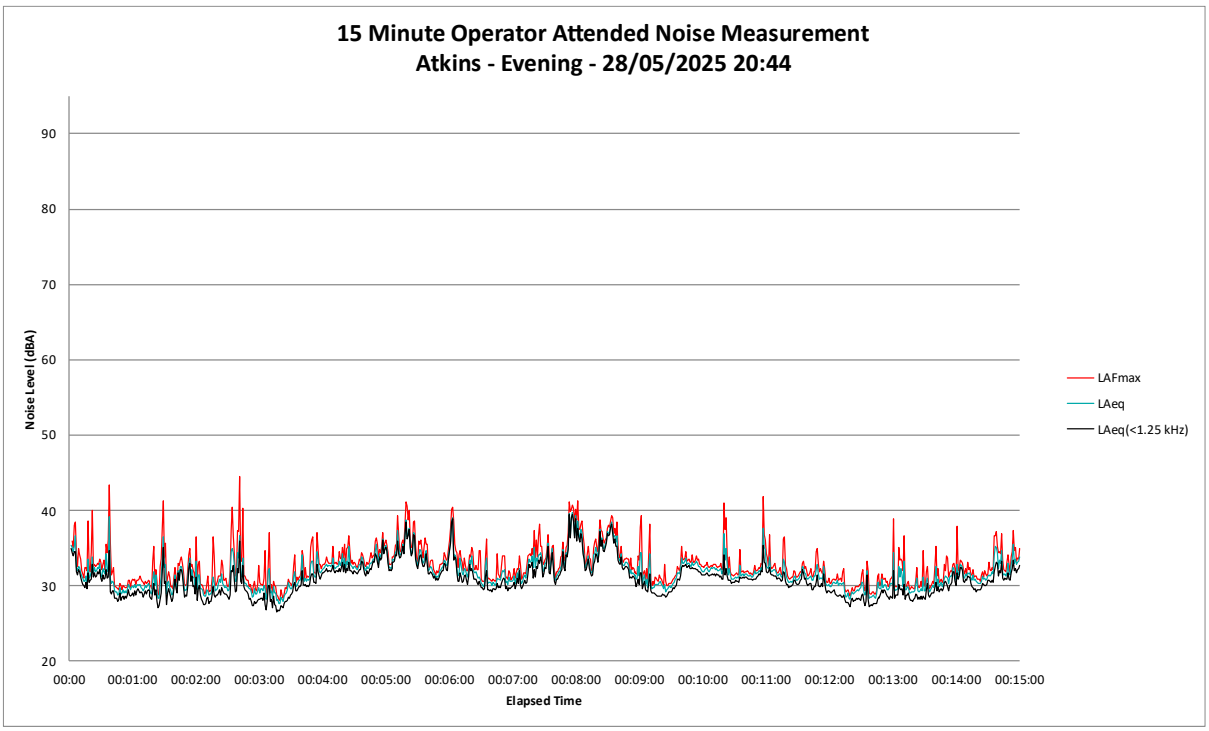


Figure B3 – Night Period – 'Atkins' Operator Attended Noise Survey Results

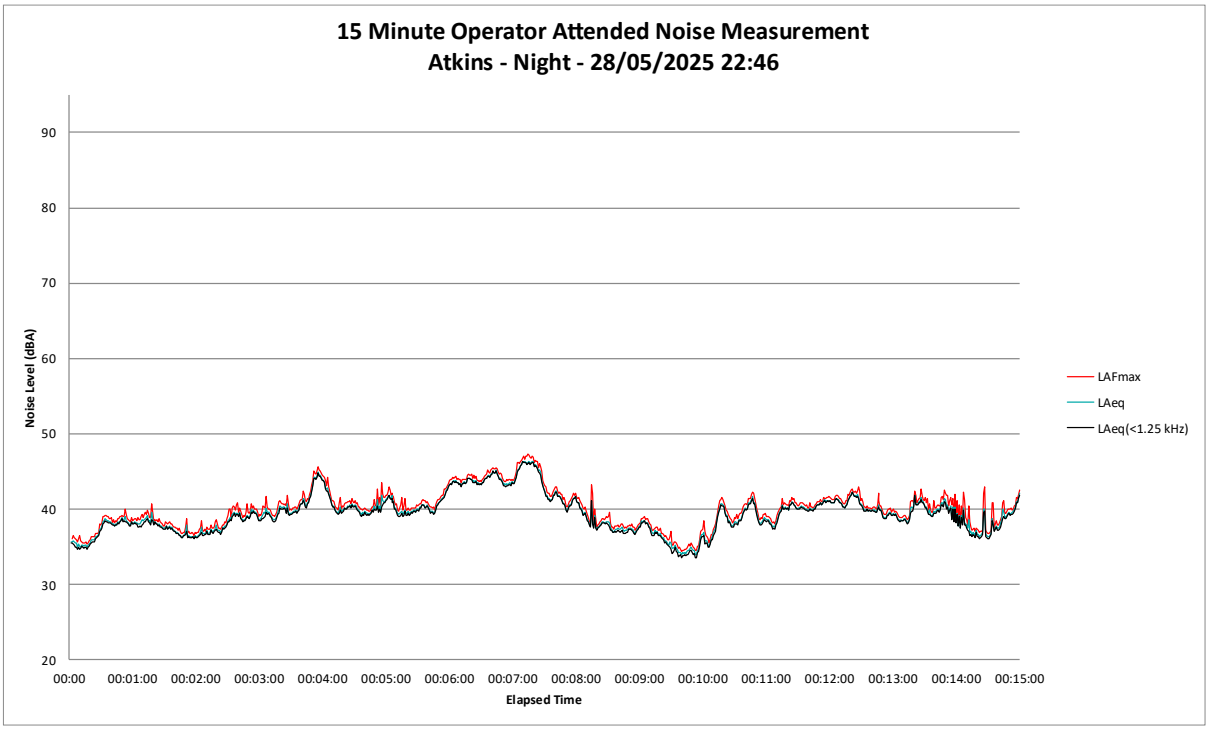


Figure B4 – Day Period – 'Clarke' Operator Attended Noise Survey Results

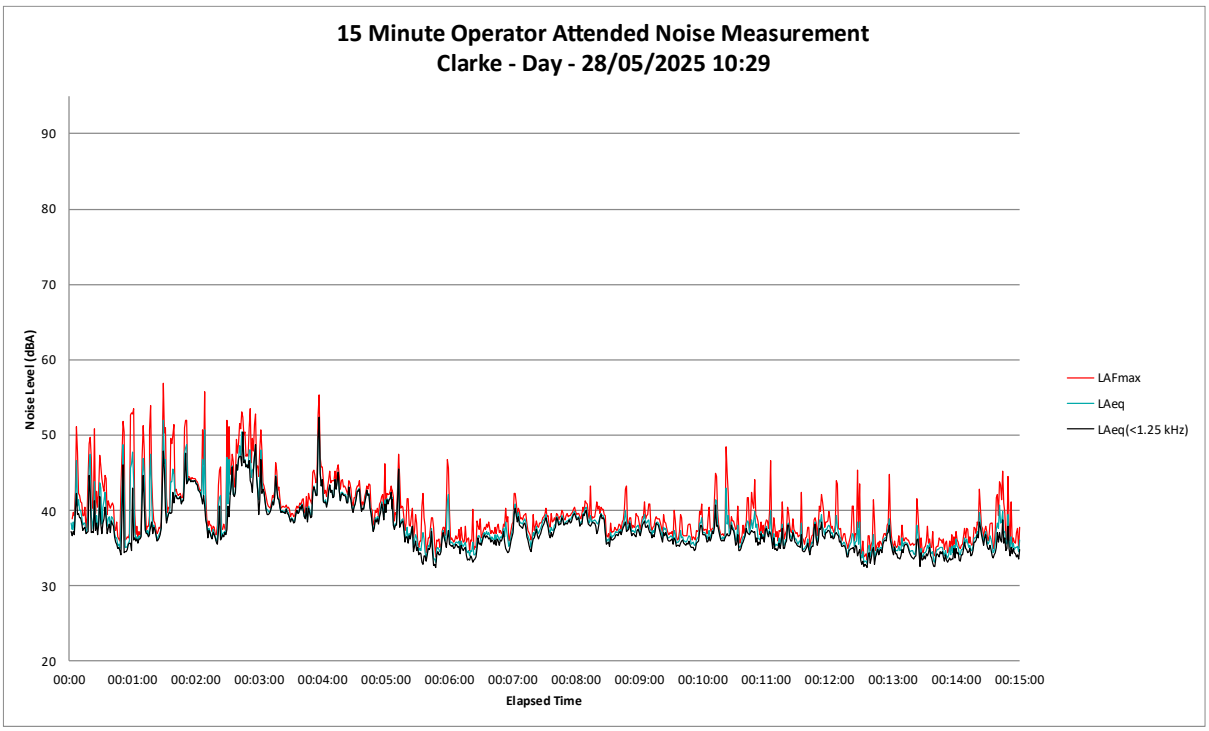


Figure B5 – Day Period – 'Wadland' Operator Attended Noise Survey Results

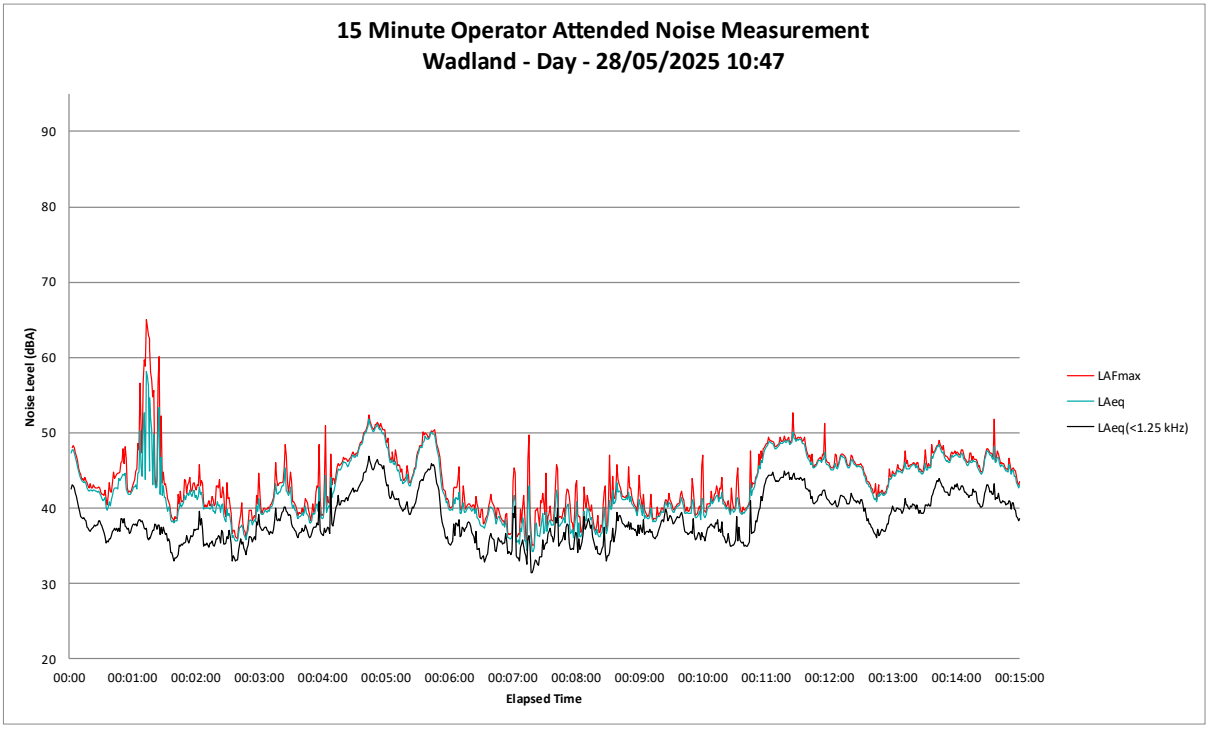


Figure B6 – Evening Period – 'Clarke' Operator Attended Noise Survey Results

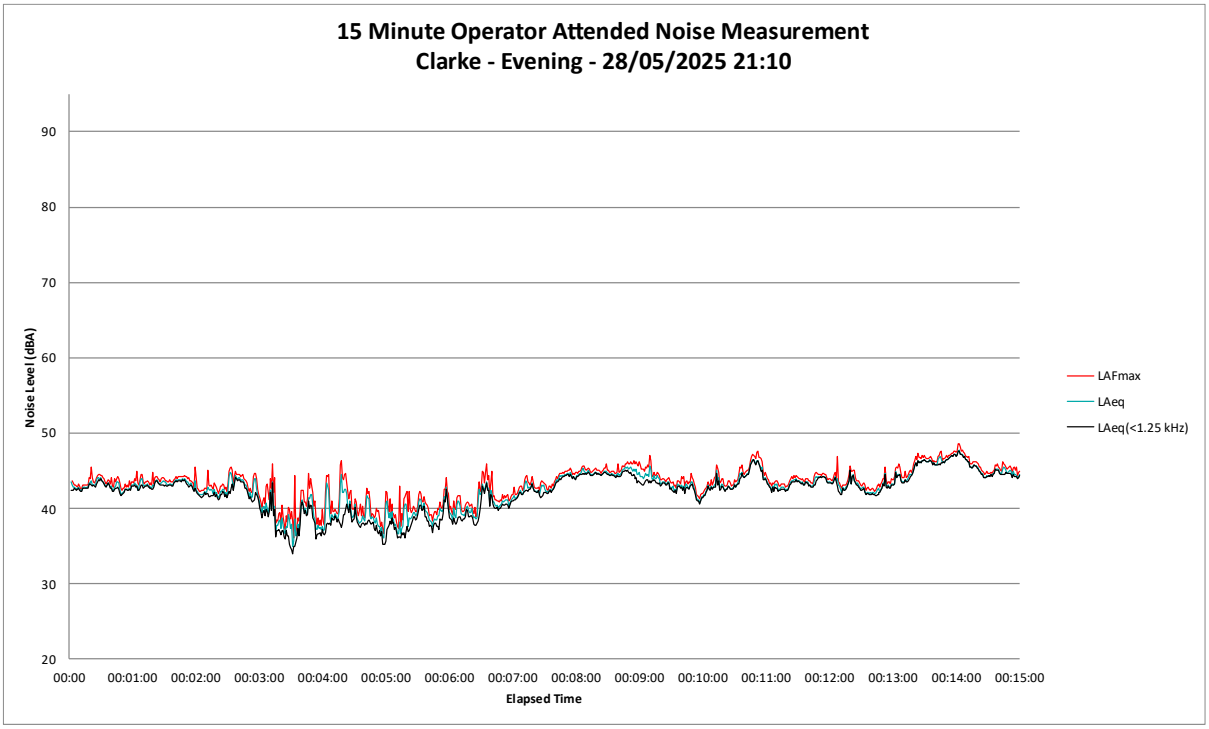


Figure B7 – Evening Period – 'Wadland' Operator Attended Noise Survey Results

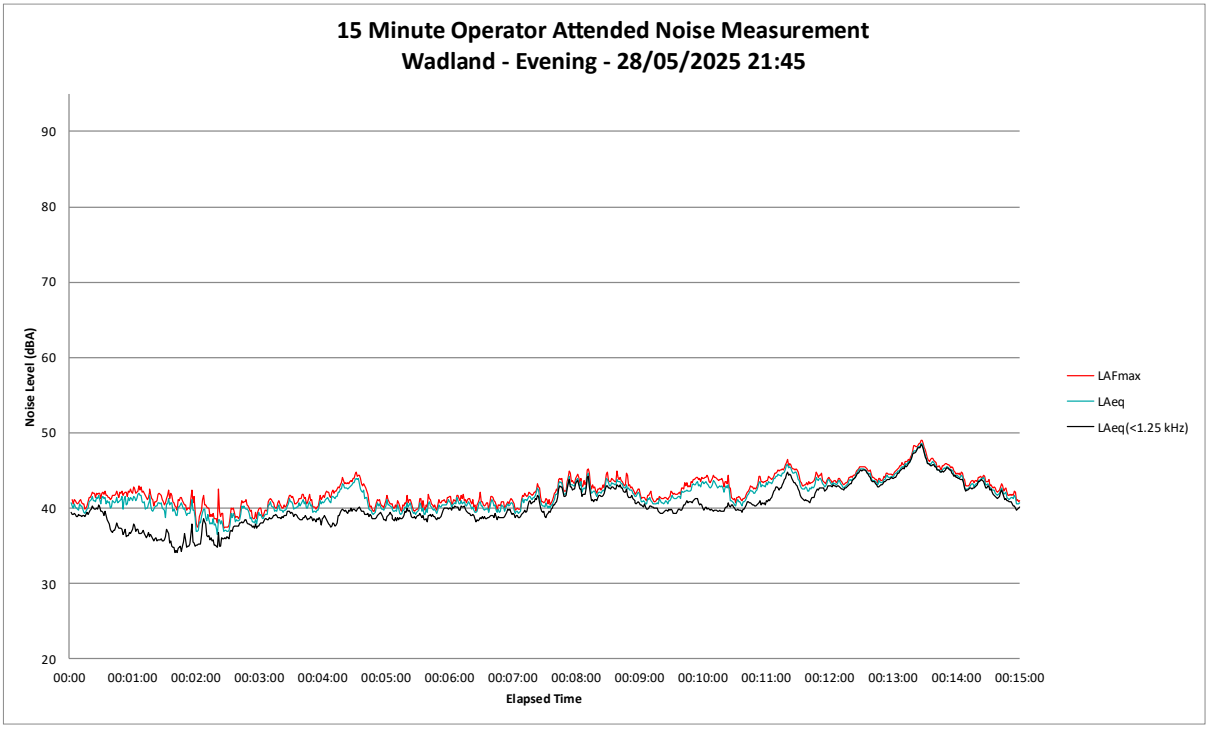


Figure B8 – Night Period – 'Clarke' Operator Attended Noise Survey Results

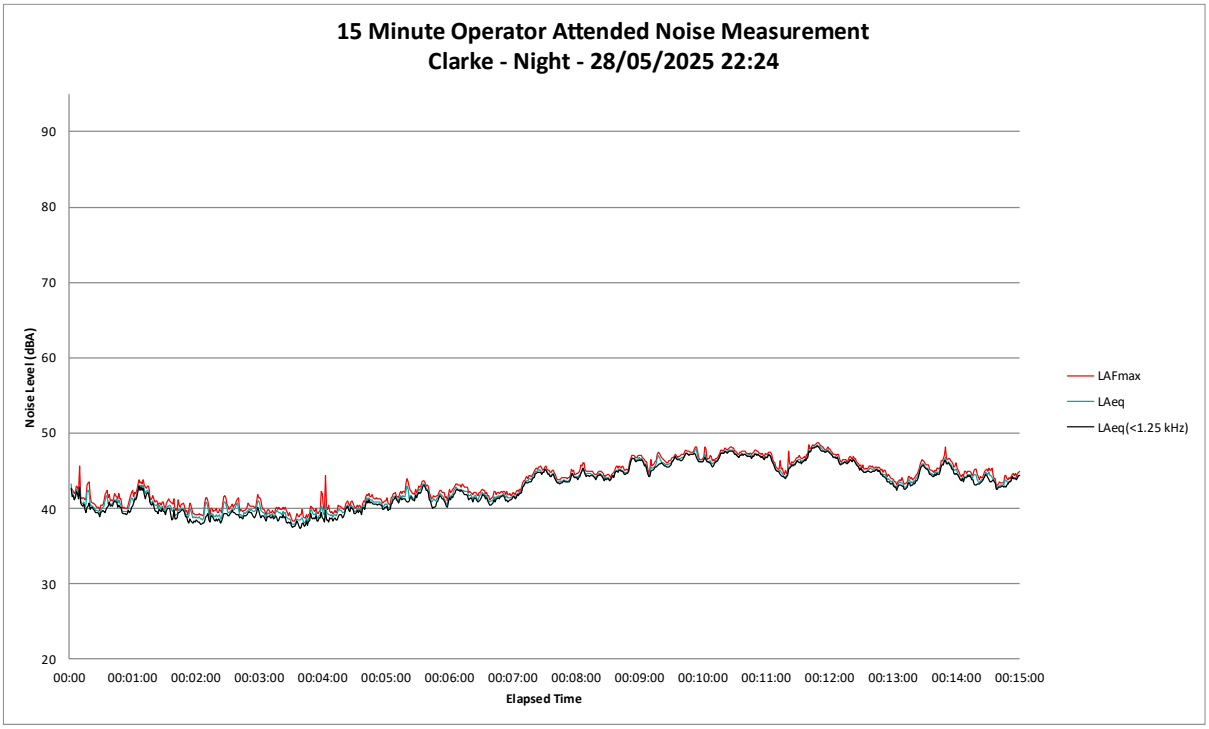


Figure B9 – Night Period – 'Wadland' Operator Attended Noise Survey Results

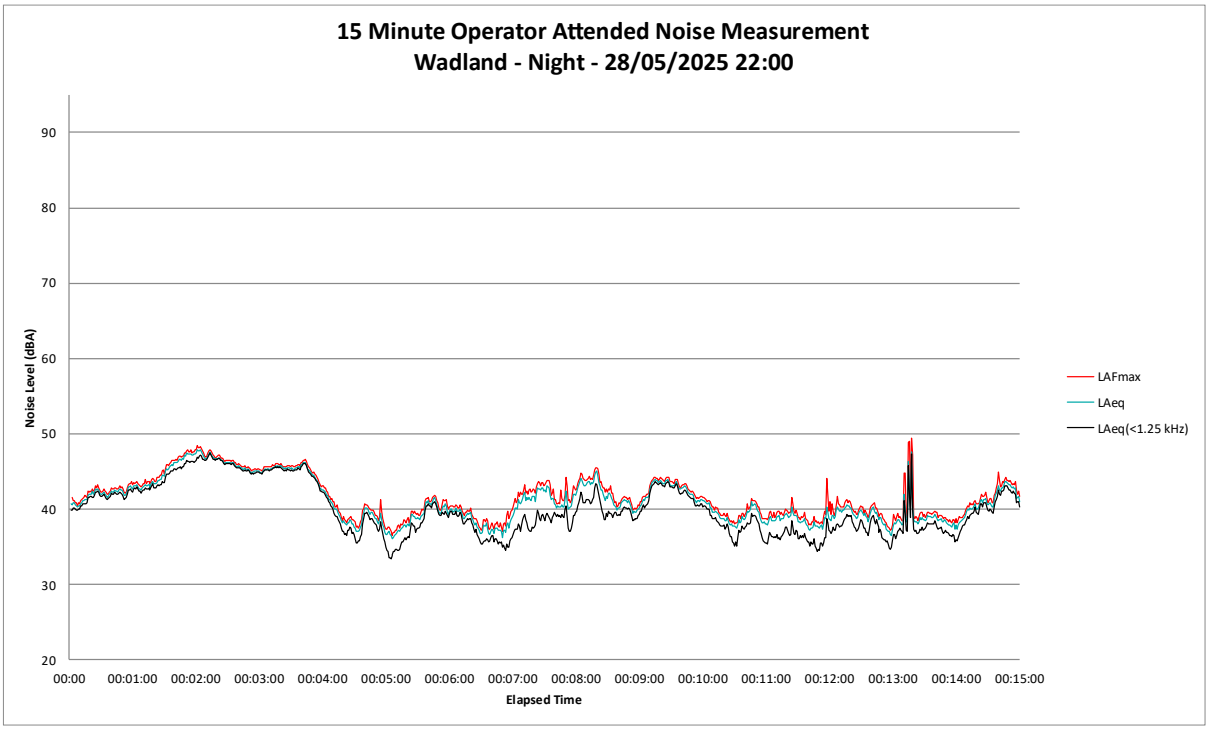


Figure B10 – Day Period – 'Hall' Operator Attended Noise Survey Results

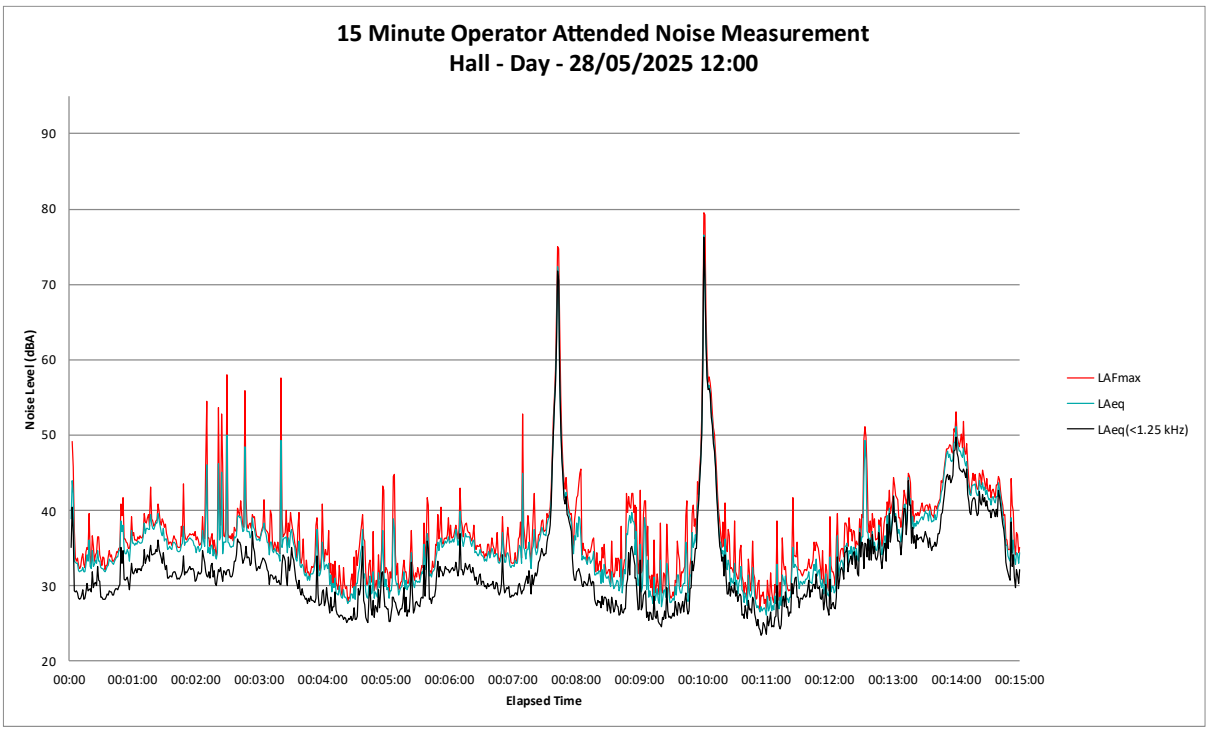


Figure B11 – Evening Period – 'Hall' Operator Attended Noise Survey Results

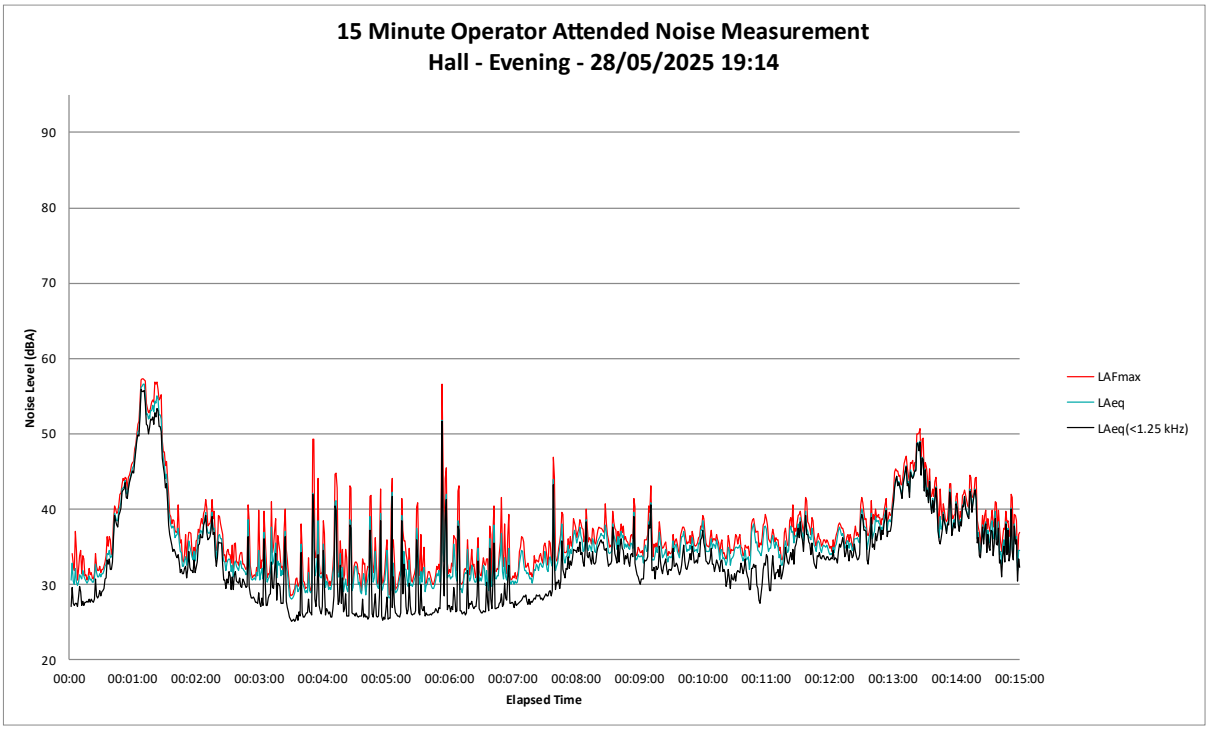


Figure B12 – Night Period – 'Hall' Operator Attended Noise Survey Results

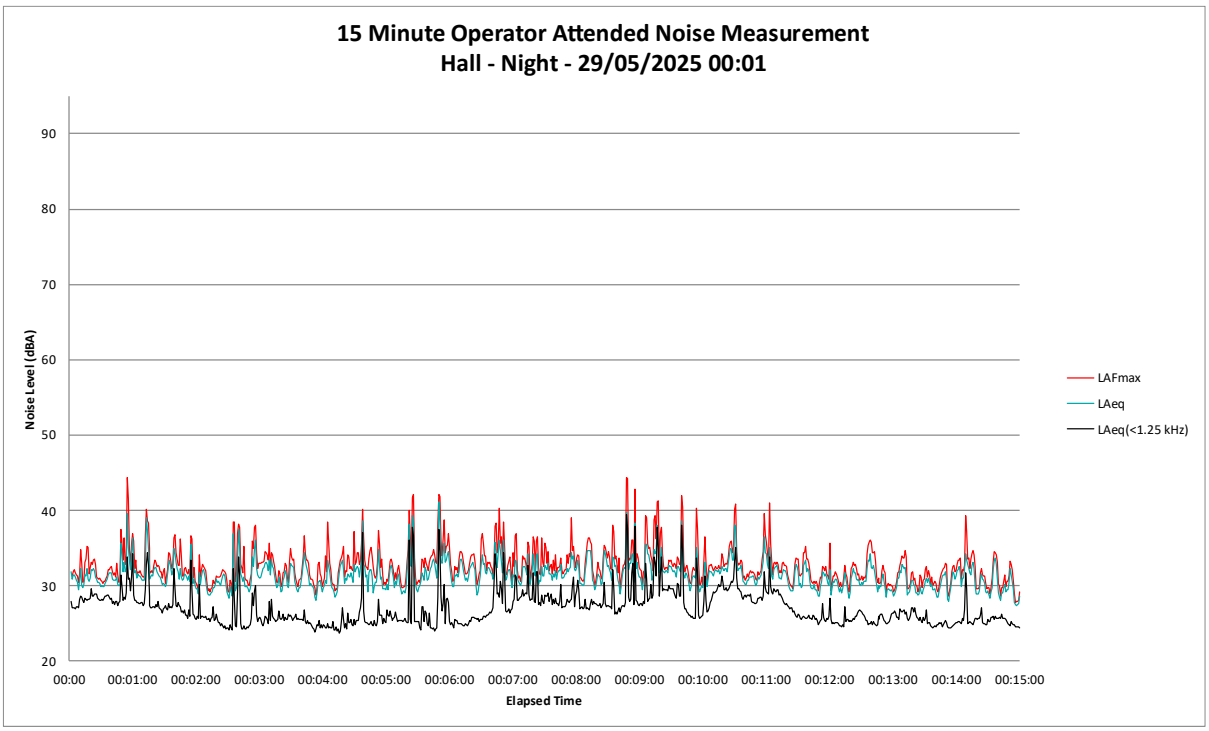


Figure B13 – Day Period – 'Lowrey' Operator Attended Noise Survey Results

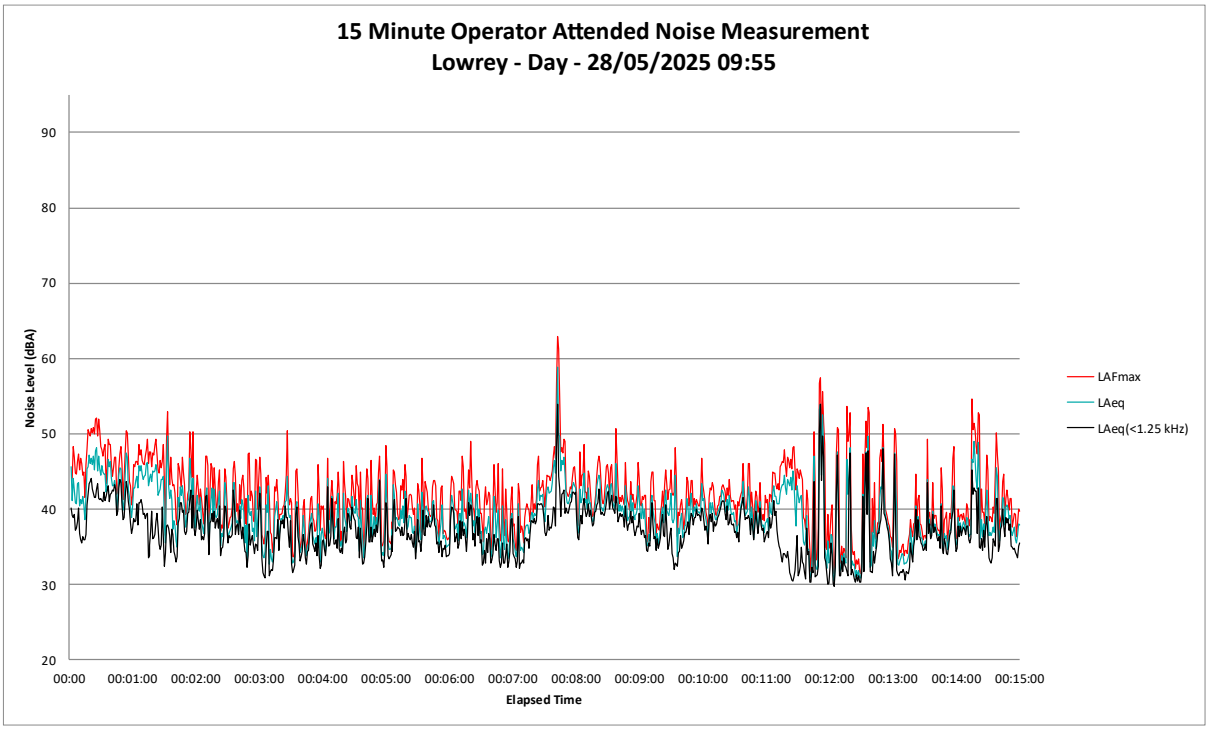


Figure B14 – Evening Period – 'Lowrey' Operator Attended Noise Survey Results

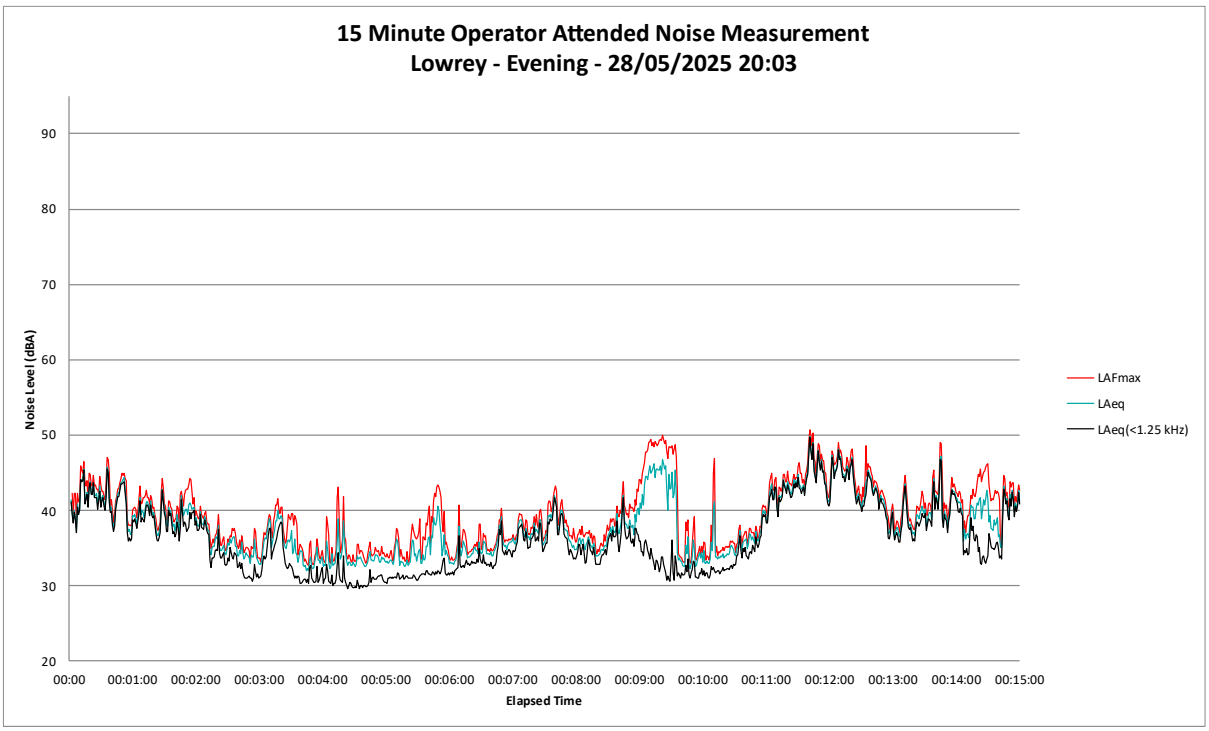


Figure B15 – Night Period – 'Lowrey' Operator Attended Noise Survey Results

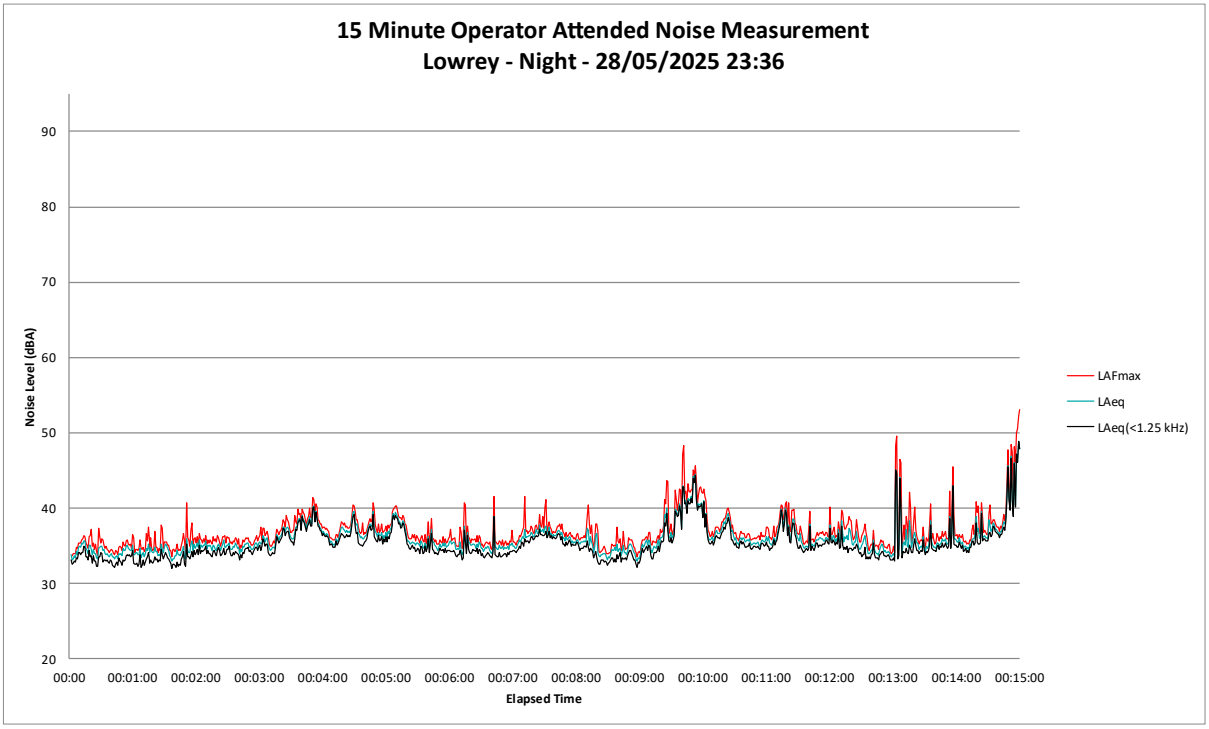


Figure B16 – Day Period – 'Pryce-Jones' Operator Attended Noise Survey Results

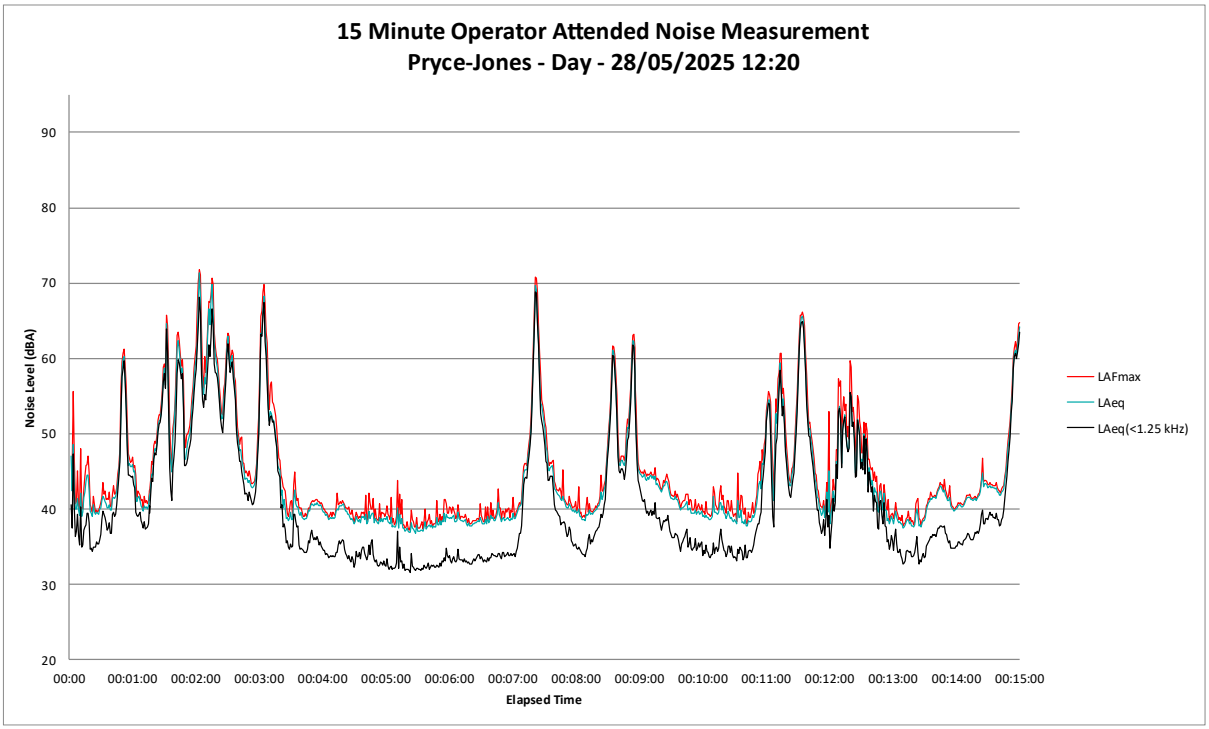


Figure B17 – Evening Period – 'Pryce-Jones' Operator Attended Noise Survey Results

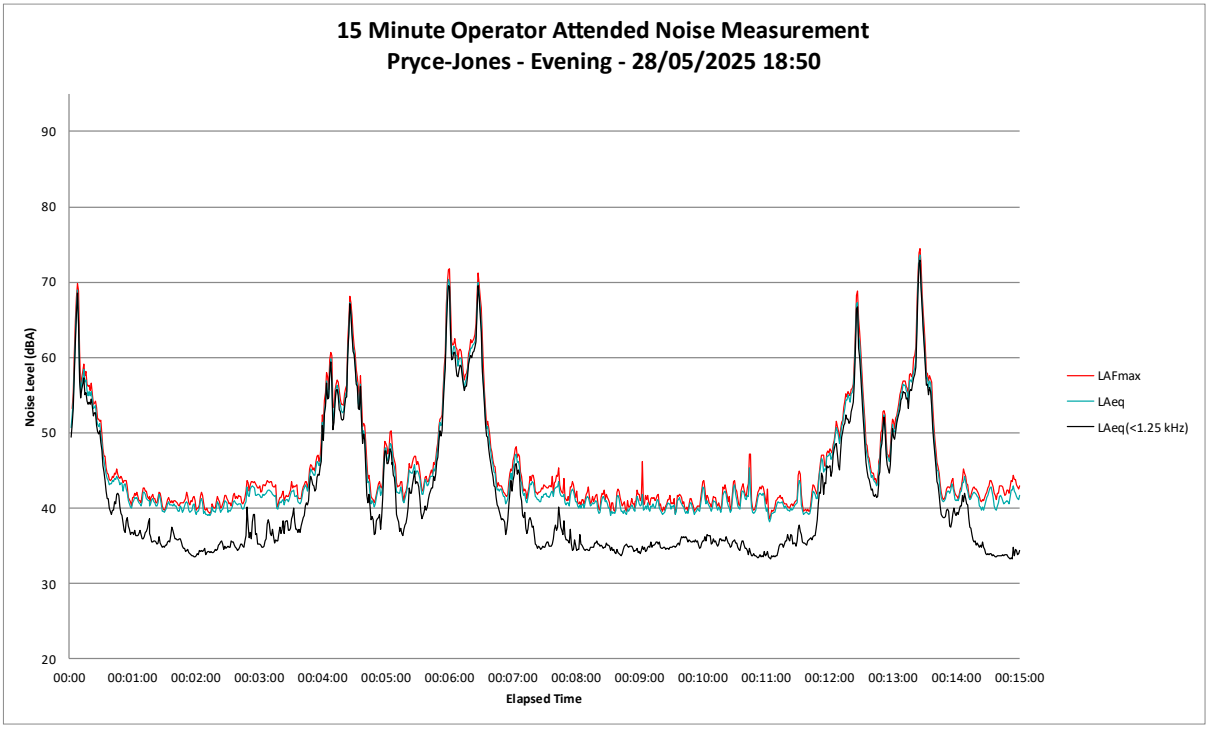


Figure B18 – Night Period – 'Pryce-Jones' Operator Attended Noise Survey Results

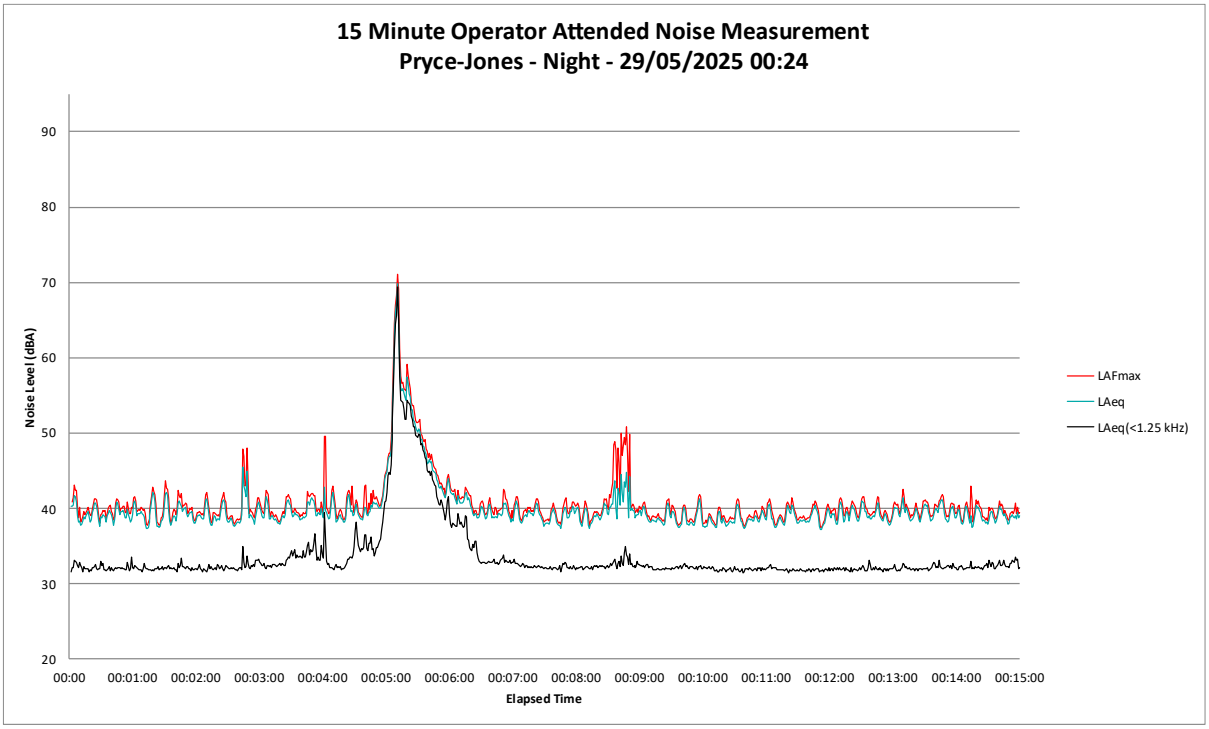


Figure B19 – Day Period – 'Van der Drift' Operator Attended Noise Survey Results

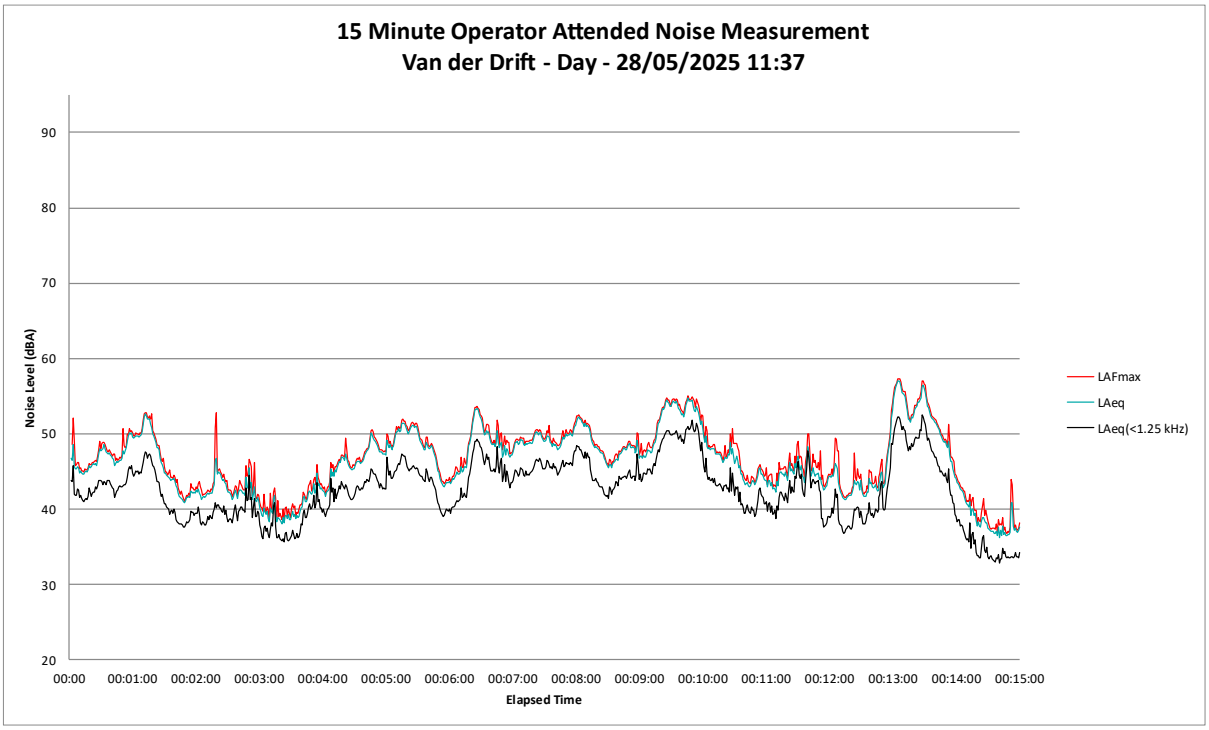


Figure B20 – Evening Period – 'Van der Drift' Operator Attended Noise Survey Results

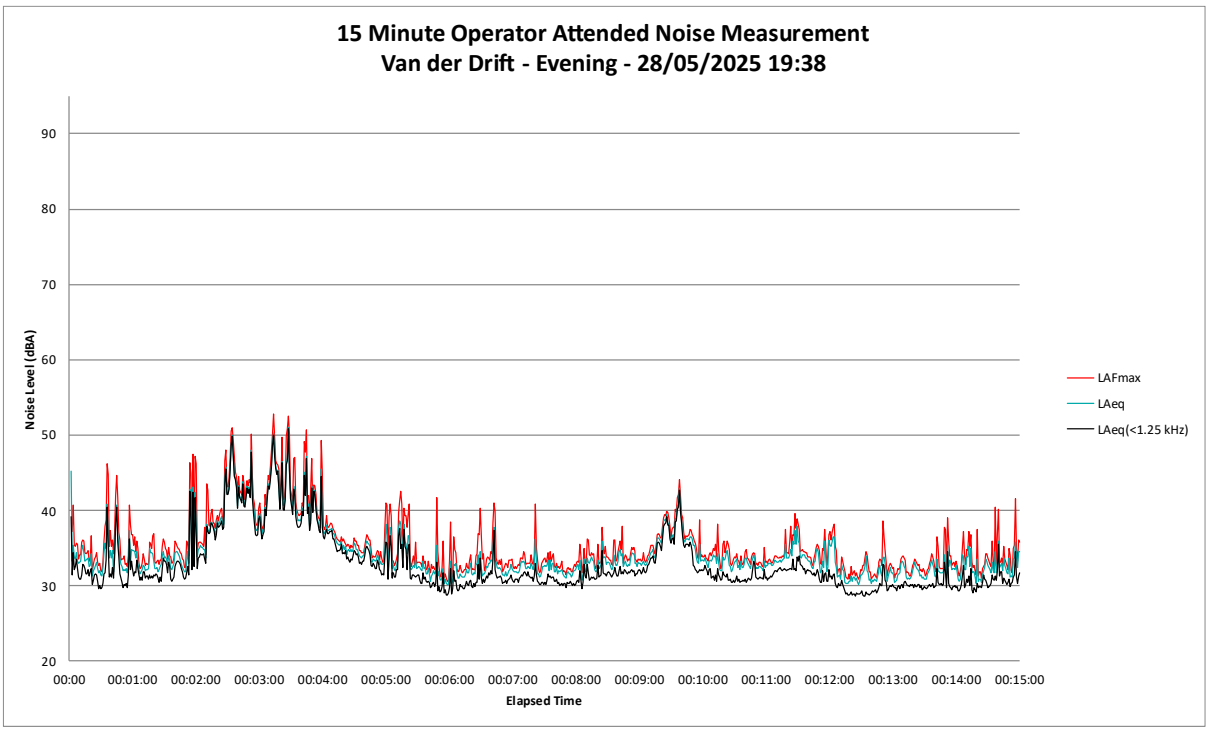


Figure B21 – Night Period – 'Van der Drift' Operator Attended Noise Survey Results

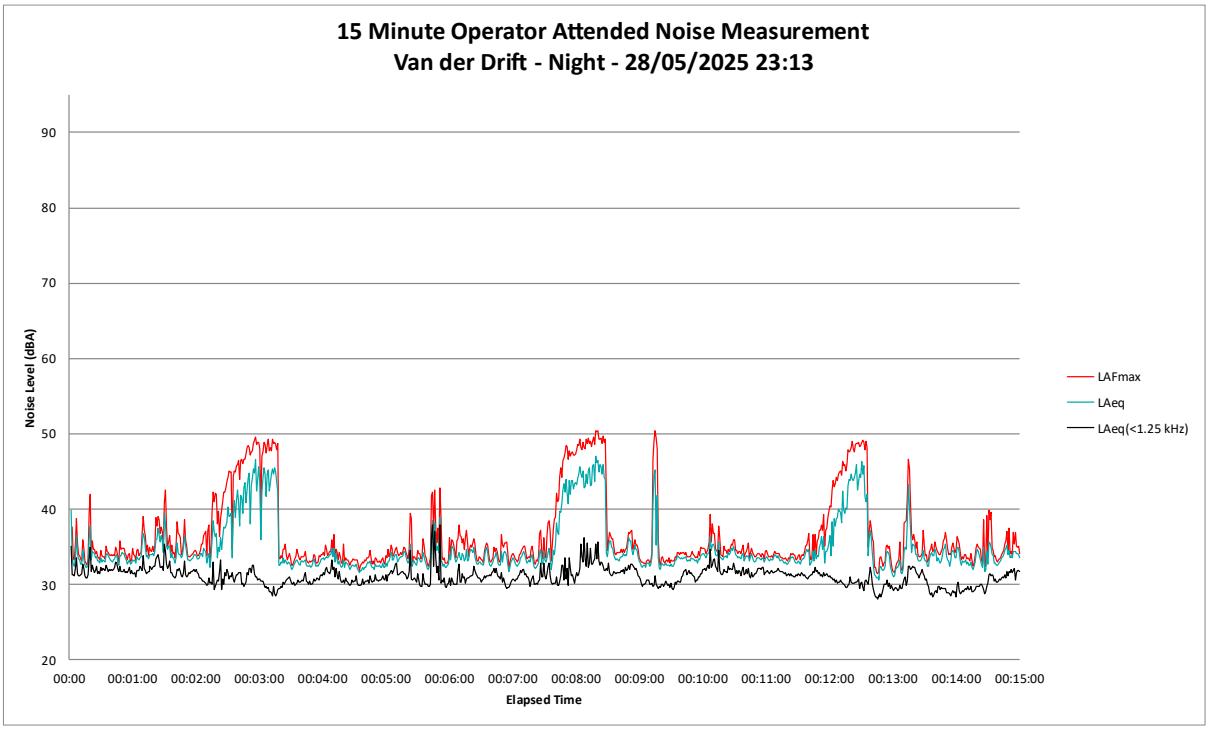


Figure B22 – Day Period – 'Greenwood' Operator Attended Noise Survey Results

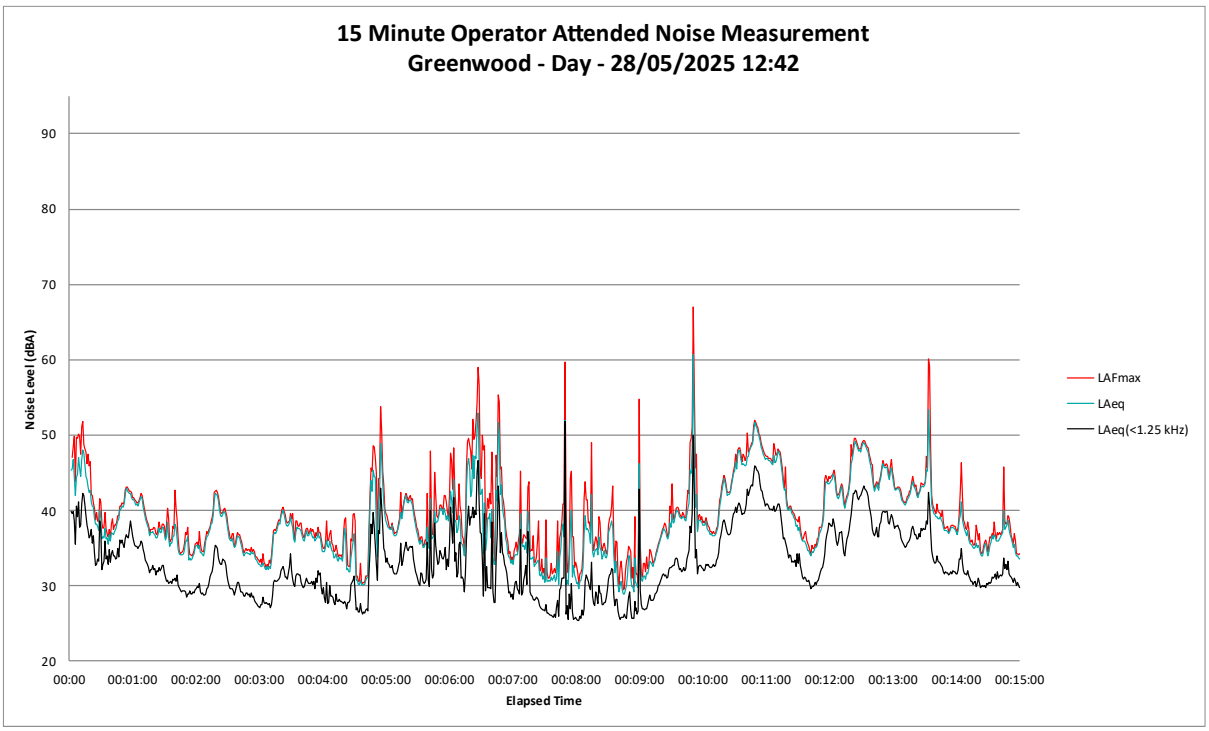


Figure B23 – Evening Period – 'Greenwood' Operator Attended Noise Survey Results

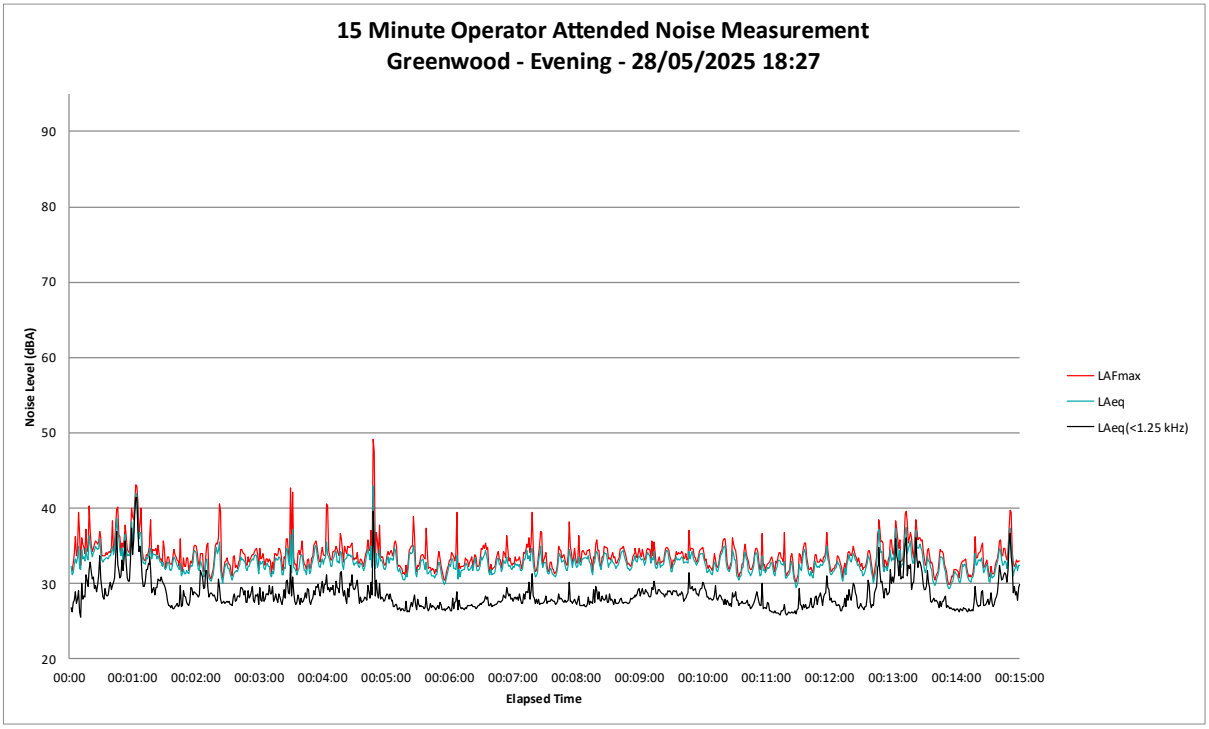
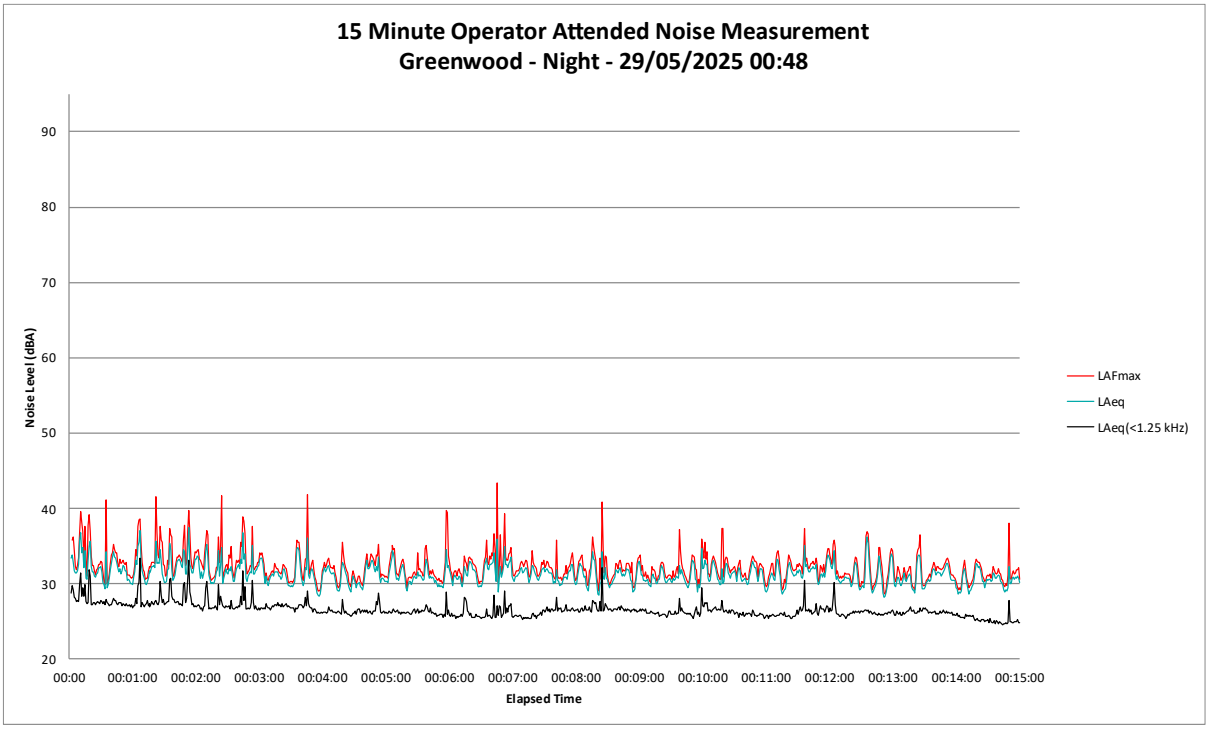
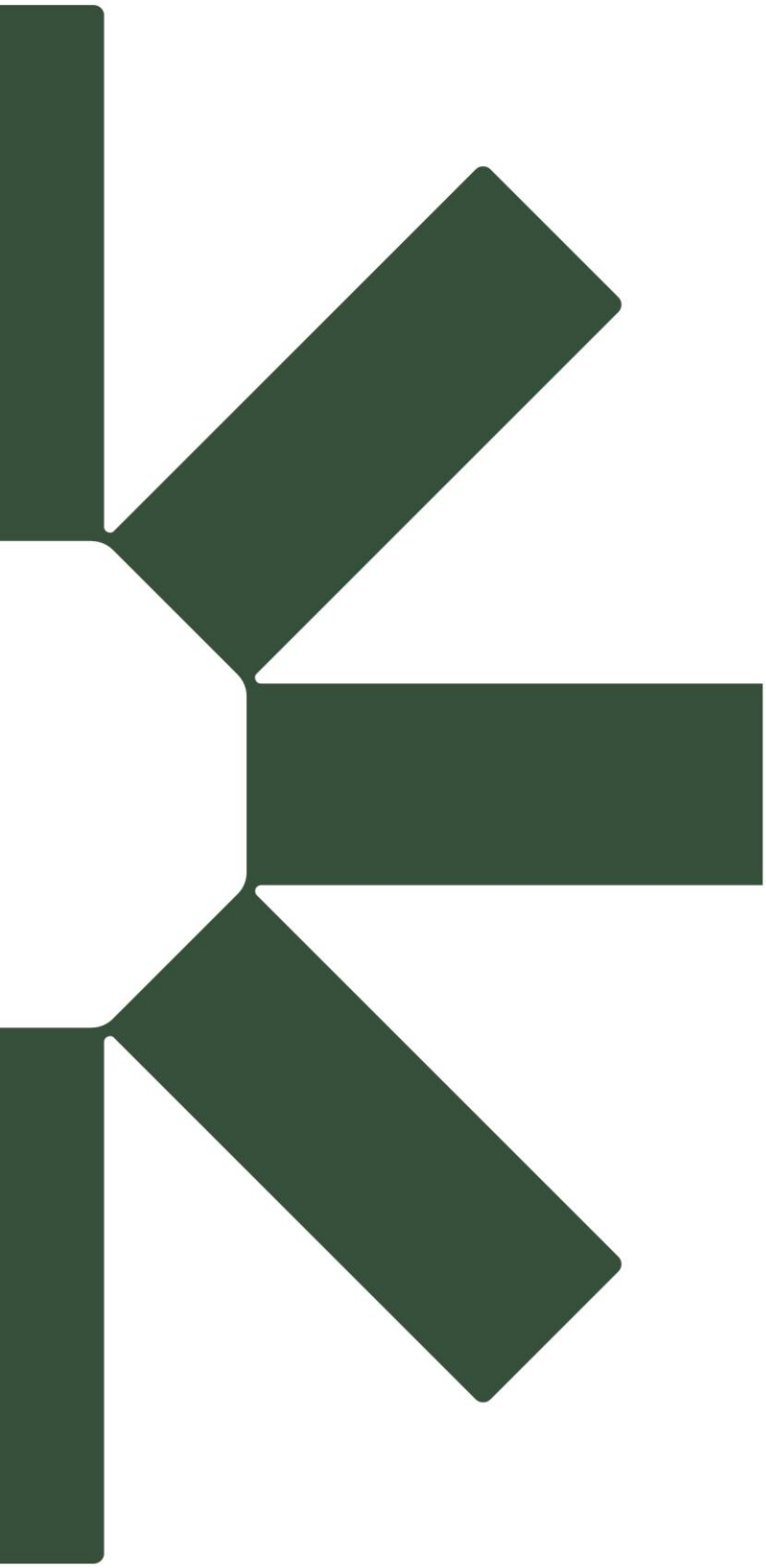


Figure B24 – Night Period – 'Greenwood' Operator Attended Noise Survey Results





Making Sustainability Happen