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**SOUTH WEST WOOD PRODUCTS LTD,
FOREST PRODUCTS CENTRE, CWMAVAN**

NOISE IMPACT ASSESSMENT

Technical Report: R8849-1 Rev 1

Date: 3rd December 2020

For: South West Wood Products Ltd

24 Acoustics Document Control Sheet

Project Title: South West Wood Products Ltd, Forest Products Centre, Cwmavan
Noise Impact Assessment

Report Ref: R8849-3 Rev 1

Date: 3rd December 2020

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Document Status and Approval Schedule

Revision	Description	Prepared By	Approved By
0	Approved for Issue	Reuben Peckham	Steve Gosling
1	Amended	Reuben Peckham	Steve Gosling

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EXECUTIVE SUMMARY

24 Acoustics Ltd has been retained by South West Wood Products to provide an assessment of the potential impact of noise from their operations at the Forest Products Centre in Cwmavan, SA13 2RX.

The assessment has been undertaken following detailed noise surveys at the nearest residential receptors to the site. An acoustic propagation model of the operations has also been developed.

The assessment has concluded that the noise impact associated with the operations will be low at all times at all receptors and therefore there are considered no noise grounds for refusal of this permit application.

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1.0 INTRODUCTION

1.1 24 Acoustics Ltd has been retained by South West Wood Products to provide an assessment of the potential impact of noise from their operations at the Forest Products Centre in Cwmavan, SA13 2RX.

1.2 This report presents the results and findings of the assessment, following noise surveys and observations undertaken on the site in November and December 2020. All noise levels in this report are provided in dB relative to 20 μ Pa. A glossary of the acoustic terminology used is provided in Appendix A.

2.0 SITE DESCRIPTION AND OPERATION

2.1 The Forest Products Centre is located east of Cwmafan. The operation involves the storage and processing of waste woods with a throughput of up to 100,000 tonnes per annum and a storage capacity on site of 10,000 tonnes.

2.2 The site utilises the following plant:

- Doppstadt 435 Shredder;
- Finlay 883 Screen/ Star Shredder
- 2 Hyundai 730 Loading Shovels/ wheeled loaders.

2.3 The typical hours of operation at the site are:

- 07.00 – 22.00 Monday to Friday
- 07.00 – 16.00 Saturdays
- 08.00 – 13.00 Sundays and bank/public holidays

- 2.5 The site is located in a semi-rural area. The nearest residential properties to the site are the houses at Heol Undeb approximately 250 m to the north-west and those at Forest Lodge Lane approximately 220 m to the south-west.

3.0 NOISE IMPACT ASSESSMENT CRITERIA

British Standard 4142:2014+A1:2019

- 3.1 British Standard 4142:2014+A1:2019 [Reference 1] provides a methodology for the assessment of commercial sound at (the exterior of) residential properties. The standard advocates a comparison between the prevailing typical L_{A90} background noise level and the L_{Aeq} source noise level. For rating purposes, if the noise source is tonal, or impulsive, in character, a rating correction of up to 15 dBA is applied. Several methods of determining the rating penalty are described. The standard states that a difference between the rating level and the background level of around +10 dBA is an indication of a 'significant adverse impact', depending on the context and a difference of around +5 dBA is likely to be an indication of an adverse impact again depending on the context. Where the rating level does not exceed the background noise (sound) level, this is an indication of the specific sound source having a low impact (depending upon the context).
- 3.2 The context is important in this circumstance as it is 24 Acoustics' understanding that an industrial user has operated out of this site for many years and therefore there is some precedence of industrial noise from the site forming part of the prevailing ambient acoustic environment in the area.

4.0 SITE NOISE SURVEYS

Background Noise Surveys

- 4.1 Long-term unattended noise surveys were undertaken on the site between 26th November and 2nd December 2020. Measurements were undertaken at the following locations (as identified in Figure 1):
- Location 1. Land to the immediate south of the houses in Heol Undeb;
 - Location 2. Nearest property at Forest Lodge Lane.

- 4.2 The measurements were undertaken in samples of five minutes using two Class 1 accuracy Rion NL52 sound level meters which were calibrated before and after the surveys using a Bruel and Kjaer Type 4231 acoustic calibrator. No drift in calibration was recorded. The monitor was installed on a tripod at a height of 1.2 m above local grade. A windshield was fitted.
- 4.3 An environmental weather station was also installed during the long-term noise surveys. A weather vane and anemometer were installed on a pole on the site at a height of 3 m above local grade. This was time-synchronised with the sound level meter and recorded wind speed and direction during the surveys.

Source Term (Plant) Noise Surveys

- 4.4 Attended noise measurements of site plant were undertaken at a similar South West Wood Products site (Eclipse Works near Glastonbury) on 18th February 2016. Sound pressure measurements were undertaken on individual plant items and this data used to obtain the sound power level of each item of plant (using standard acoustical theory). These measurements were undertaken in terms of the overall A-weighted and linear octave band sound pressure levels using a Class 1 accuracy Norsonic Nor-118 sound level meter which was calibrated before and after the surveys using a Bruel and Kjaer Type 4231 acoustic calibrator.
- 4.5 All measurements were made in accordance with BS 7445: 1991 "Description and measurement of environmental noise Part 2 - Acquisition of data pertinent to land use" [Reference 2]. Calibration certificates of all instrumentation used is provided in Appendix B.

Noise Survey Results- Background Noise Levels

- 4.6 The results of the long-term unattended noise survey undertaken are shown graphically in Appendix C together with the corresponding wind speed and direction data.
- 4.7 The background noise survey data has been filtered for the following meteorological conditions (to determine the appropriate representative background noise level during daytime operations):
- Average wind speed less than 5 m/s;
 - Southerly component wind direction (generating favourable propagation from the site to the receptors);

4.8 The corresponding background noise levels, under the conditions described above, are shown in Tables 1 and 2 below.

Day and Date	Time Period	Noise Level, dB LA90, 1 hour		
		Minimum	Maximum	Typical
Thursday 26/11/2020	07:00 - 22:00	50	50	50
Friday 27/11/2020	07:00 - 22:00	50	50	50
Monday 30/11/2020	07:00 - 22:00	49	49	49
Tuesday 1/12/2020	07:00 - 22:00	48	49	48
Wednesday 2/12/2020	07:00 - 22:00	49	49	49
Representative Weekday				49
Saturday 28/11/2020	07:00 - 16:00	50	50	50
Representative Saturday				49
Sunday 29/11/2020	08:00 - 13:00	49	50	49
Representative Sunday				49

Table 1: Background Noise Levels, Location 1, Heol Undeb

Day and Date	Time Period	Noise Level, dB LA90, 1 hour		
		Minimum	Maximum	Typical
Thursday 26/11/2020	07:00 - 22:00	41	48	42
Friday 27/11/2020	07:00 - 22:00	40	48	43
Monday 30/11/2020	07:00 - 22:00	37	46	40
Tuesday 1/12/2020	07:00 - 22:00	38	47	40
Wednesday 2/12/2020	07:00 - 22:00	43	44	43
Representative Weekday				42
Saturday 28/11/2020	07:00 - 16:00	44	47	45
Representative Saturday				42
Sunday 29/11/2020	08:00 - 13:00	42	43	42
Representative Sunday				42

Table 2: Background Noise Levels, Location 2, Forest Lodge Lane

4.9 Please note that shaded areas refer to part-samples. BS 4124 does not provide an objective means of defining the typical/ representative background noise level. 24 Acoustics uses the average less one standard deviation.

Noise Survey Results- Plant Noise Surveys

4.10 The noise survey data recorded locally around each plant item was used to calculate the sound power level of each individual plant using standard acoustical theory. This data was then used to populate an acoustic propagation model of the plant (described in Section 5 below). The sound power levels of each plant item are provided in full in Appendix D and summarised in Table 3 below.

Plant	Sound Power Level, dBA
Finlay Screener/ Star Shredder	99
Doppstadt 435	108
2*JCB Loader 437- 360/ Front Loader	98

Table 3: Summary of Derived Plant Sound Power Levels (Prior to Noise Control)

5.0 ACOUSTIC PROPOGATION MODEL

5.1 In order to quantify the noise emission from the site and to rank the dominant plant items within the operation an acoustic model of the operations has been developed. This has used the derived plant data reported in Section 4 above. Immi 2017 noise mapping software has been used and this has used the propagation methodology advocated in ISO 9613 [Reference 3] to calculate the noise level from the operations at the residential neighbours. The following propagation assumptions have been used:

- Ambient temperature of 10 degrees C;
- Relative humidity of 70%;
- Soft ground propagation (G=1) on land/ hard ground propagation (G=0) over water.

5.2 The model has assumed a worst-case scenario of all plant operating continuously during a worst-case assessment hour.

5.3 Noise contour maps showing the propagation of noise across the site are provided in Figure 2. Table 4 below summarises the noise survey results at each receptor location.

Receptor	Noise Level, dB L _{Aeq, 1 hour}
1. Heol Undeb	43
2. Forest Lodge Lane	45

Table 4: Calculated Operational Noise Levels

6.0 NOISE IMPACT ASSESSMENT

6.1 An assessment was undertaken to determine the level of noise impact from the operations at the proposed development site in accordance with the requirements of BS 4142:2014+A1:2019.

6.2 BS 4142 states that certain acoustic features can increase the significance of impact of that expected from a basic comparison between the specific sound level and the background sound level. Where such features are present at the assessment location a character correction should be applied to the specific sound level to determine the rating level. The rating correction is determined based upon the impulsivity and tonality of the sound noise level. The subjective method described in the standard describes the following rating corrections:

Tonality:	Tone just perceptible at receptor:	+ 2 dBA;
	Tone clearly perceptible at receptor:	+ 4 dBA;
	Tone highly perceptible at receptor:	+ 6 dBA.
Impulsivity:	Impulsivity just perceptible at receptor:	+ 3 dBA;
	Impulsivity clearly perceptible at receptor:	+ 6 dBA;
	Impulsivity highly perceptible at receptor:	+ 9 dBA.

6.3 The standard states that where tonal and impulsive characteristics are present in the specific sound within the same reference period then these two corrections can both be taken into account. If one feature is dominant then it might be appropriate to apply a single correction. Where both features are likely to affect perception and response, the corrections ought normally to be added in a linear fashion. It also states that if intermittency is readily distinctive against the residual acoustic environment, a penalty of 3 dB can be applied.

6.4 Noise from the operations was not considered characteristic or distinctive in nature and, therefore, it is considered that a rating correction in accordance with BS 4142 is not required. Tables 5 and 6 below summarise the BS 4142 noise impact assessment for the weekday, Saturday and Sunday periods of operation at each receptor respectively.

	Periods of Proposed Operation		
	Weekday	Saturday	Sundays
Typical Background Noise Level, dB LA90, 1 hour	49	49	49
Specific Source Noise Level, dB LAeq, 1 hour	43	43	43
Rating Character Correction, dB	0	0	0
Rating Noise Level, dB	43	43	43
BS 4142 Assessment Level, dB	-6	-6	-6

Table 4: BS 4142 Noise Impact Assessment, Location 1 Heol Undeb

	Periods of Proposed Operation		
	Weekday	Saturday	Sundays
Typical Background Noise Level, dB LA90, 1 hour	42	42	42
Specific Source Noise Level, dB LAeq, 1 hour	45	45	45
Rating Character Correction, dB	0	0	0
Rating Noise Level, dBA	45	45	45
BS 4142 Assessment Level, dB	+3	+3	+3

Table 5: BS 4124 Noise Impact Assessment, Location 2, Forest Lodge Lane

- 6.5 The assessment indicates that the BS 4142 assessment level will be no greater than + 3 dB at the residential properties in Forest Lodge Lane. This will fall between a low and adverse impact, subject to context. Given the existing industrial nature of the site, however, the context is such that it is considered that it will generate a low impact. A low/negligible noise impact will be experienced at all times at Heol Undeb. This is primarily as a result of higher background noise levels caused by the adjacent river.
- 6.6 BS 4142:2014 requires a statement of uncertainty to be provided. In this case the assessment has been undertaken both subjectively and objectively. There is usually an uncertainty of +/- 3 dB associated with an acoustic prediction model undertaken in accordance with ISO 9613, however, in this case the model has been validated using on – site measurements. The greatest uncertainty/ variability in the noise impact is believed to occur as a result of the wind direction, however, the assessment has been performed under downwind propagation conditions and is therefore considered to represent a worst case. As a result uncertainty associated with the assessment is considered to be minimised.

7.0 CONCLUSIONS

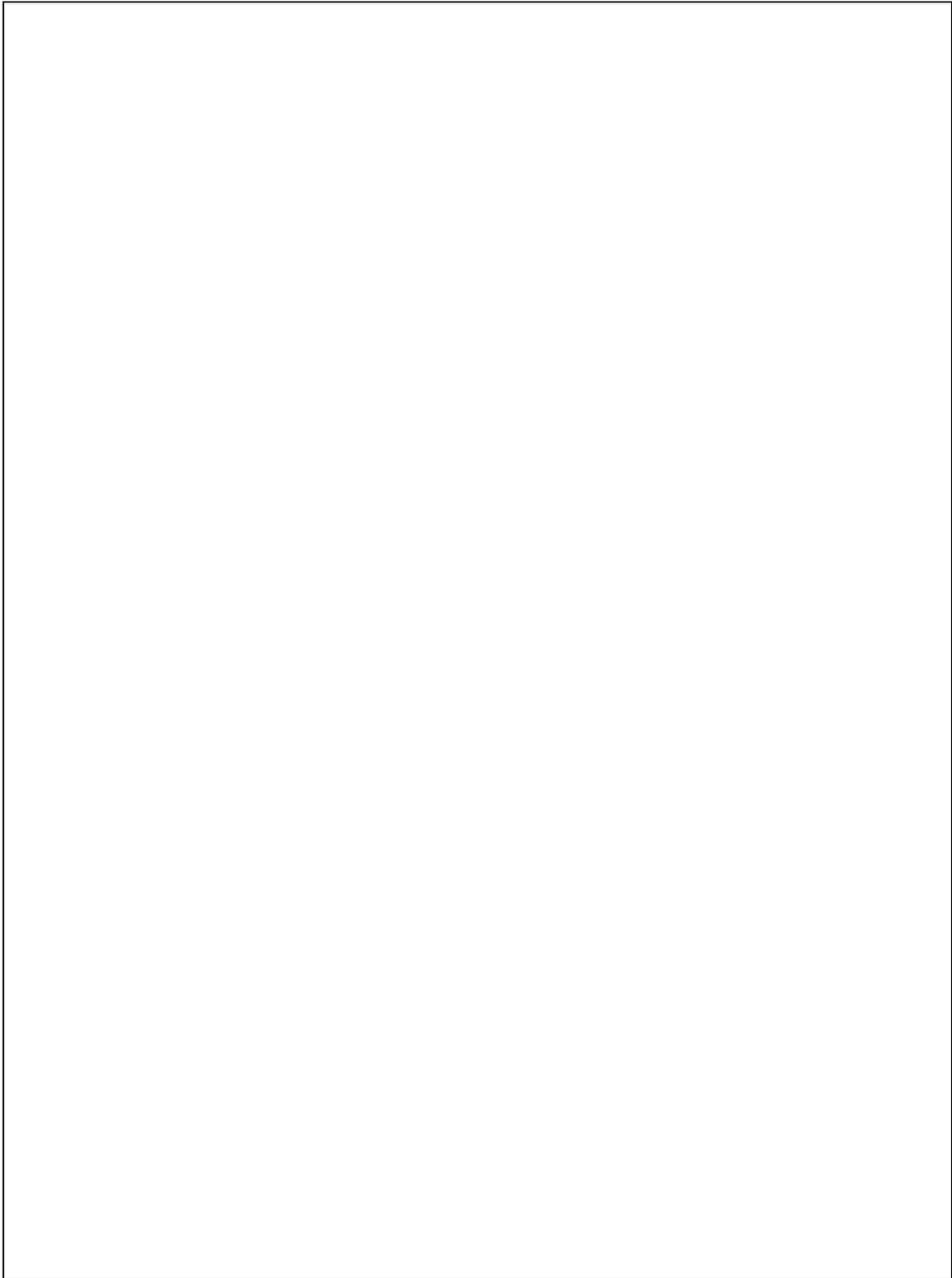
- 7.1 24 Acoustics Ltd has been retained by South West Wood Products to provide an assessment of the potential impact of noise from their operations at the Forest Products Centre in Cwmavan, SA13 2RX.
- 7.2 The assessment has been undertaken following detailed noise surveys at the nearest residential receptors to the site. An acoustic propagation model of the operations has also been developed.
- 7.3 The assessment has concluded that the noise impact associated with the operations will be low at all times at all receptors and therefore there are considered no noise grounds for refusal of this permit application.

REFERENCES

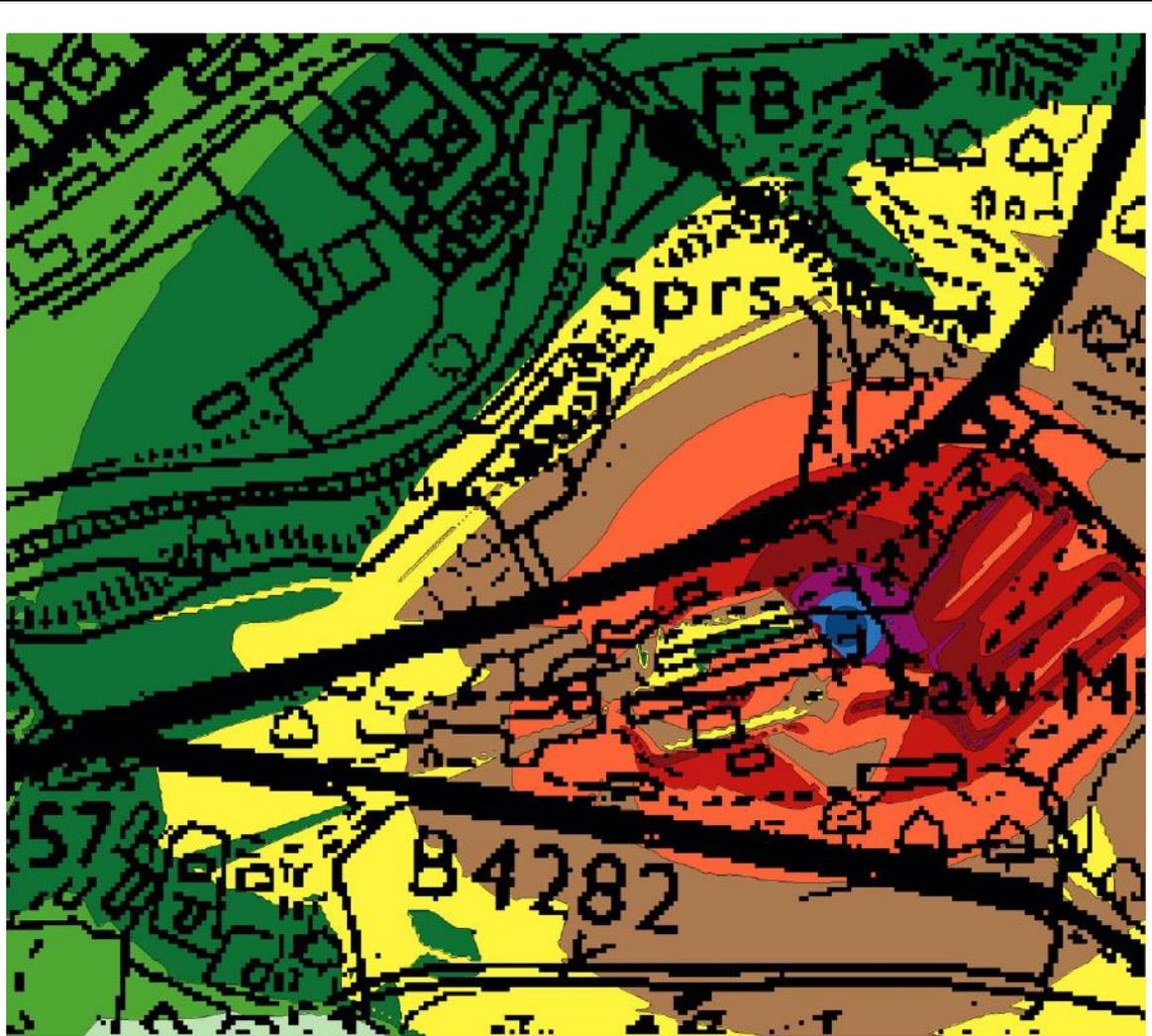
1. British Standards Institution. British Standard 4142: Methods for rating and assessing industrial and commercial sound, 2014.
2. British Standards Institution. BS 7445: 'Description and measurement of environmental noise Part 2 - Acquisition of data pertinent to land use', 1991.
3. International Standards Institution. ISO 9613. Acoustics- Attenuation during Propagation of Sound Outdoors, Parts 1 and 2, 1993.



Project: South West Wood Products Cwmavan	Title: Site Location and Noise Survey Locations		 24Acoustics
DWG No: Figure 1	Scale: N.T.S.	Rev: -	
Date: December 2020	Drawn By: RP	Job No: 8849	



Project: South West Wood Products Cwmavan	Title: Proposed Site Layout		 24Acoustics
DWG No: Figure 2	Scale: N.T.S.	Rev: -	
Date: December 2020	Drawn By: RP	Job No: 8849	



Project: South West Wood Products Cwmavan		Title: Site Noise Contours, dB LAeq, 1 hour		 24Acoustics
DWG No: Figure 3		Scale: N.T.S.	Rev: -	
Date: December 2020		Drawn By: RP	Job No: 8849	

APPENDIX A: Acoustic Terminology

Noise is defined as unwanted sound. The range of audible sound is from 0 to 140 dB. The frequency response of the ear is usually taken to be around 18 Hz (number of oscillations per second) to 18000 Hz. The ear does not respond equally to different frequencies at the same level. It is more sensitive in the mid-frequency range than the lower and higher frequencies and because of this, the low and high frequency components of a sound are reduced in importance by applying a weighting (filtering) circuit to the noise measuring instrument. The weighting which is most widely used and which correlates best with subjective response to noise is the dBA weighting. This is an internationally accepted standard for noise measurements.

For variable sources, such as traffic, a difference of 3 dBA is just distinguishable. In addition, a doubling of traffic flow will increase the overall noise by 3 dBA. The 'loudness' of a noise is a purely subjective parameter, but it is generally accepted that an increase/ decrease of 10 dBA corresponds to a doubling/ halving in perceived loudness.

External noise levels are rarely steady, but rise and fall according to activities within an area. In attempt to produce a figure that relates this variable noise level to subjective response, a number of noise indices have been developed. These include:

- i) The L_{Amax} noise level

This is the maximum noise level recorded over the measurement period.

- ii) The L_{Aeq} noise level

This is "equivalent continuous A-weighted sound pressure level, in decibels" and is defined in British Standard BS 7445 as the "value of the A-weighted sound pressure level of a continuous, steady sound that, within a specified time interval, T , has the same mean square sound pressure as a sound under consideration whose level varies with time".

It is a unit commonly used to describe construction noise and noise from industrial premises and is the most suitable unit for the description of other forms of environmental noise. In more straightforward terms, it is a measure of energy within the varying noise.

iii) The L_{A10} noise level

This is the noise level that is exceeded for 10% of the measurement period and gives an indication of the noisier levels. It is a unit that has been used over many years for the measurement and assessment of road traffic noise.

iv) The L_{A90} noise level

This is the noise level that is exceeded for 90% of the measurement period and gives an indication of the noise level during the quieter periods. It is often referred to as the background noise level and is used in the assessment of disturbance from industrial noise.

APPENDIX B: Instrumentation Calibration Certificates

Acoustic Calibration Services Limited
Unit 6H, Diamond Industrial Centre
Works Road, Letchworth Garden City
Hertfordshire SG6 1LW
Tel: 01462610085 Mobile: 0771 886 4944
Email: trevjohnlewis@aol.com
or
cal@acousticcalibration.co.uk
web: www.acousticcalibration.co.uk

ACSL
Acoustic Calibration Services Limited

CERTIFICATE OF CALIBRATION

Model: Rion NL-32 **Serial No:** 00851400

Organisation: 24 Acoustics Ltd, 3 Bassett Avenue, Southampton
SO16 7DP

Job Number: 2751 **Customer Order Reference:** M Bennett

The Sound Level Meter was assessed for conformance with International Standards IEC 60651 and IEC 60804 using test procedures described in BS 7580 Part 1. The meter claims Type 1 accuracy conformance and it was against these requirements that all the results were evaluated.

The sound level meter was fitted with a Rion UC-53A Microphone, Serial Number 308863 and a Rion NH-21 preamplifier, Serial Number 16817. The microphone was replaced with a suitable input device in order to apply electrical signals to the preamplifier and the obtained results were corrected for when a WS-10 windshield is being used.

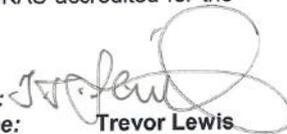
A B&K 4231 Acoustic Calibrator Serial No: 2705996 was utilised in establishing the initial acoustic calibration setting of the meter.

The sound level meter passed all applied tests with no deviations from Type 1 specification, in accordance with IEC 60651 and IEC 60804. Accordingly, the meter meets the requirements of BS 7580 Part 1.

The sound level meter should be set to read 93.8 dB when used with the associated acoustic calibrator, microphone and preamplifier as detailed above at reference atmospheric pressure.

All ACSL's calibration instrumentation is fully traceable to National Standards. The acoustic references are calibrated by laboratories which are UKAS accredited for the purpose.

Certificate No: 15607
Date of Issue: 9th April 2019

Signature: 
Print Name: Trevor Lewis

Registered Office: Robert Lewis Accountants, 4 Capricorn Centre, Cranes Farm Road, Basildon, Essex SS14 3JJ
Registered No: 4143457 VAT No: GB 770505441 Directors: Trevor J Lewis, Owen R Clingan MIOA

NL32D
NL32F



CERTIFICATE OF CALIBRATION

Date of Issue: 12 November 2019

Certificate Number: TCRT19/1841

Issued by:
ANV Measurement Systems
Beaufort Court
17 Roebuck Way
Milton Keynes MK5 8HL
Telephone 01908 642846 Fax 01908 642814
E-Mail: info@noise-and-vibration.co.uk
Web: www.noise-and-vibration.co.uk

Page 1 of 3 Pages
Approved Signatory

K. Mistry



Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems

Customer 24 Acoustics Ltd
Armstrong House
3 Bassett Avenue
Southampton
SO16 7DP

Order No. 315837
Description Sound Level Meter / Pre-amp / Microphone / Associated Calibrator
Identification

Manufacturer	Instrument	Type	Serial No. / Version
Rion	Sound Level Meter	NL-32	00982867
Rion	Firmware		1.400AN1003
Rion	Pre Amplifier	NH-21	28279
Rion	Microphone	UC-53A	314837
Rion	Calibrator	NC-74	34536109
	Calibrator adaptor type if applicable		NC-74-002

Performance Class 1
Test Procedure TP 2.SLM 61672-3 TPS-49
Procedures from IEC 61672-3:2006 were used to perform the periodic test.
Type Approved to IEC 61672-1:2002 No **Approval Number**
If YES above there is public evidence that the SLM has successfully completed the applicable pattern evaluation tests of IEC 61672-2:2003
Date Received 12 November 2019 **ANV Job No.** TRAC19/11495
Date Calibrated 12 November 2019

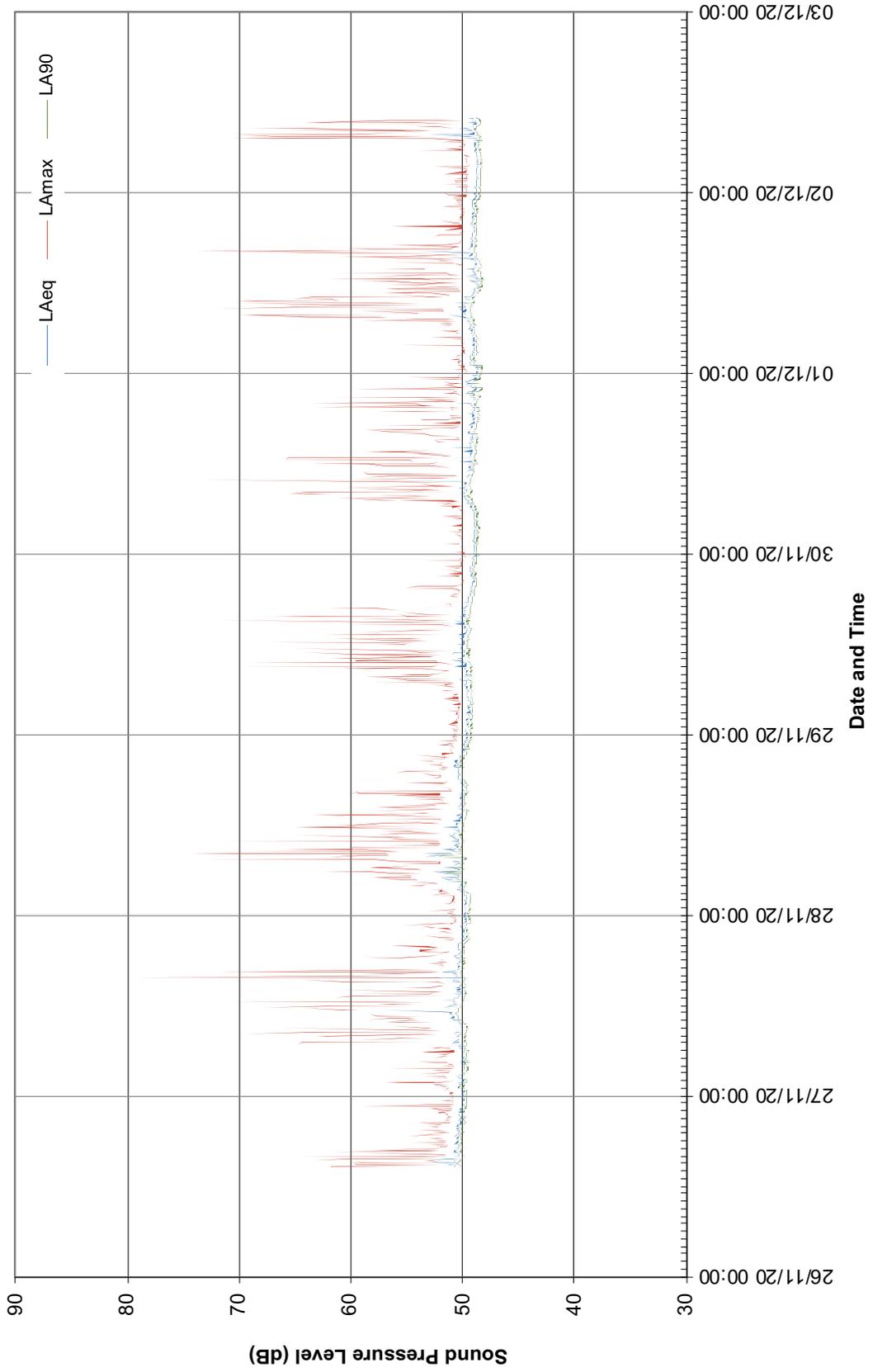
The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2006, for the environmental conditions under which the tests were performed. However, no general statement or conclusion can be made about conformance of the sound level meter to the full requirements of IEC 61672-1:2002 because evidence was not publicly available, from an independent testing organisation responsible for pattern approvals, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2002 and because the periodic tests of IEC 61672-3:2006 cover only a limited subset of the specifications in IEC 61672-1:2002.

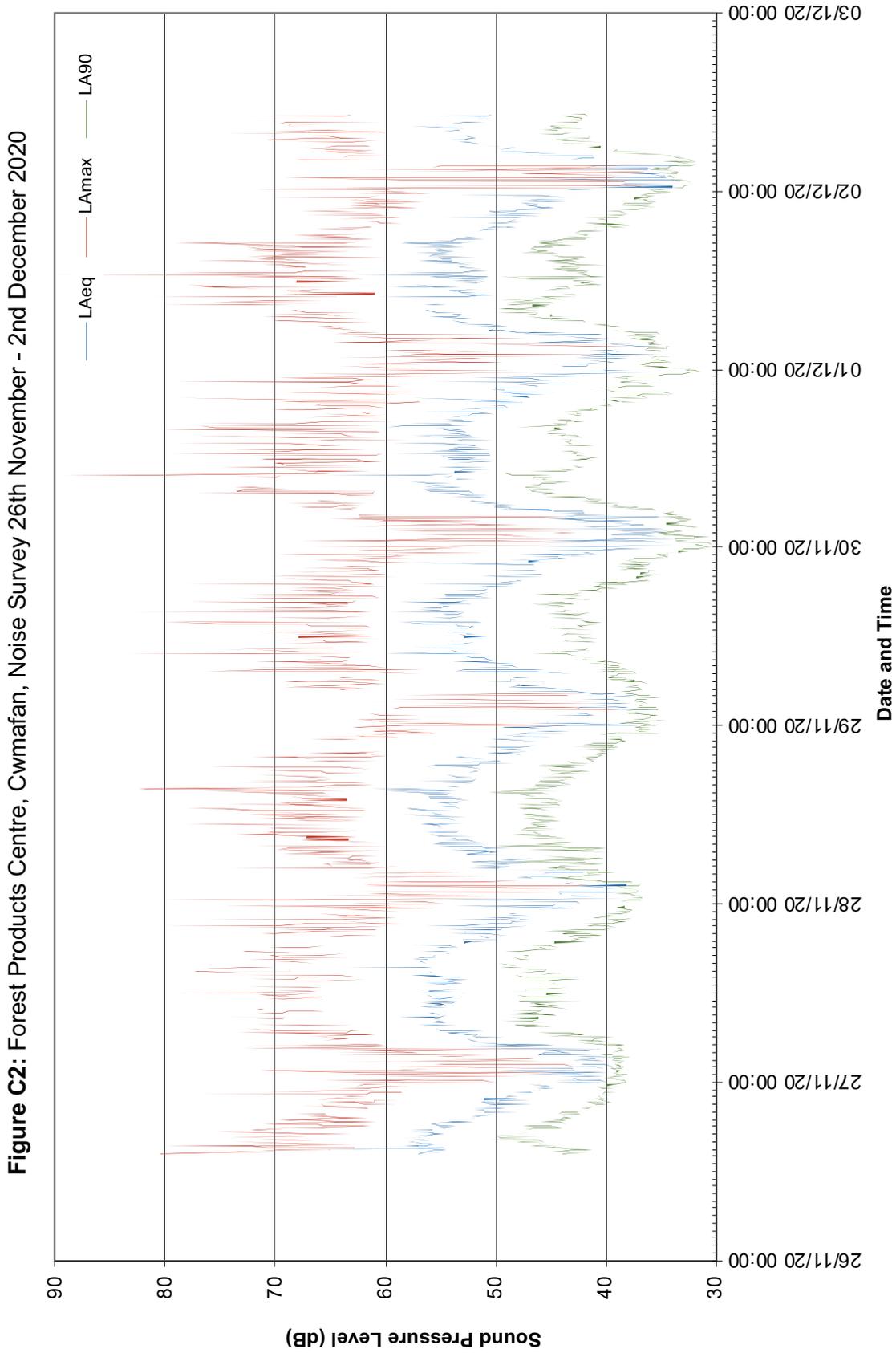
Previous Certificate	Dated	Certificate No.	Laboratory
	24 October 2017	TCRT17/1699	ANV Measurement Systems

This certificate provides traceability of measurement to recognised national standards, and to units of measurement realised at the National Physical Laboratory or other recognised national standards laboratories. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.

APPENDIX C: Noise and Meteorological Survey Results

Figure C1: Forest Products Centre, Cwmafan Noise Survey, Location 1, 26th November - 2nd December 2020





APPENDIX D: Plant Sound Power Levels

Plant	L _{WA}	Octave Band (Hz) and Sound Power Level, dB								
		31.5	63	125	250	500	1.0 k	2.0 k	4.0 k	8.0 k
Finlay Screen/ Star Shredder	99	102	109	102	94	96	94	91	86	80
Doppstadt 435 Shredder	108	106	119	112	103	106	102	100	97	90
JCB Loader 437	98	90	95	97	101	96	92	89	85	80

Table D1: Derived Plant Sound Power Levels