



Dalfad Wind Farm

Environmental Impact Assessment Report

Technical Appendix 9.2: Baseline Survey

APPENDIX 9.2 – BASELINE SURVEY

1. INTRODUCTION

- 1.1 This Technical Appendix sets out the details for the baseline noise survey undertaken for the Proposed Development noise assessment. It supports **Chapter 9: Noise** of the EIA Report and should be read, where necessary, alongside **Chapter 9** and its other technical appendices.
- 1.2 **Technical Appendix 9.1 Assessment Methodology** describes the assessment methods, criteria and general assumptions. **Technical Appendix 9.3: Noise Calculations, Predictions and Assessment** presents the acoustic source data, calculation inputs and detailed prediction results for each assessment element. **Technical Appendix 9.4: Noise Curtailment Strategy** presents an indicative noise curtailment strategy for the operational wind turbine noise assessment.
- 1.3 Baseline noise measurements were carried out at five locations in line with *ETSU-R-97 The Assessment and Rating of Noise from Wind Farms* (ETSU, 1996). Methodology employed for the noise survey was in accordance with the *IOA Good Practice Guide to the Application of ETSU-R-97* (IOA, 2013) and its supplementary guidance notes (SGN), including *Supplementary Guidance Note 1: Data Collection* (IOA, 2014). Following publication of *Assessment and Rating of Wind Turbine Noise* (ARWTN) (DESNZ, 2026), the survey data and processing methodology were reviewed and are considered suitable for use within the ARWTN assessment framework.
- 1.4 Measured noise levels have been correlated with hub height wind speeds measured by a SoDAR and standardised to 10 m to define background noise curves with reference to SGN 2: *Data Processing and Derivation of ETSU-R-97 Background Curves* (IOA, 2014) and SGN 4: *Wind Shear* (IOA, 2014).

2. SURVEY METHODOLOGY AND INSTRUMENTATION

Measurement Locations

- 2.1 Baseline noise measurements were undertaken at five residential locations in the vicinity of the Proposed Development over a period of 4 weeks between 30th April and 28th May 2026. Locations were selected to provide representative coverage of noise-sensitive receptors around the Site, taking account of the predicted geographical extent of

operational wind turbine noise, the distribution of residential properties and the need to minimise the influence of atypical local sources, where practicable.

- 2.2 Measurement locations were discussed and agreed with East Ayrshire Council (EAC), being selected as set out in **Table 1** to provide a robust representative background noise coverage for relevant receptors in the vicinity of the Proposed Development.

Table 1 – Baseline Noise Measurement Location Details

Location Name	Easting	Northing	Receptors Represented
M1 – Whiteholm	262404	623930	R7-R10
M2 – Springhill	263577	624715	R6, R13-R21
M3 – Boghead	264193	619996	R1, R2, R4, R5
M4 – Stonebriggs	263595	619274	R3
M5 – Nether Guelt	262464	619938	R11, R12, R22, R23

- 2.3 Measurement locations are also shown at **Figure 9.1**.
- 2.4 The sound level meters were field-calibrated upon installation and collection, with no notable sensitivity drift. A description of the noise environment and measurement results at each measurement location is provided at **Appendix A**.

Instrumentation

- 2.5 Rion NL-52 sound level meters corresponding to the Class 1 standard in BS EN 61672, were used for the noise measurements, alongside a Brüel and Kjær 4231 Class 1 sound level calibrator, as set out in **Table 2**.

Table 2 – Noise Survey Equipment Details

Measurement Location	Equipment	Serial Number	Date of prior calibration
M1 – Whiteholm	Rion NL-52	01032451	15/04/2026
M2 – Springhill	Rion NL-52	00810320	15/01/2026
M3 – Boghead	Rion NL-52	00921232	23/07/2024
M4 – Stonebriggs	Rion NL-52	00620893	24/10/2024
M5 – Nether Guelt	Rion NL-52	00231708	13/03/2026
All	Brüel & Kjær 4231	3009009	09/06/2025

- 2.6 Sound Level Meter calibration certificates are valid for 24-months, while Field Calibrator calibration certificates are valid for 12-months. All equipment had a valid calibration certificate at the time of the measurements. The calibration certificates for equipment are provided at **Appendix B**.

- 2.7 The microphones were fitted with double skin windshields based on the recommended design in *ETSU W/13/00386/REP Noise Measurements in Windy Conditions* (Davis, 1996) and mounted on a tripod at a height of 1.2-1.5 m.
- 2.8 Wind speeds were measured at a number of heights between 10 m and 200 m using a SoDAR sited within the wind farm Proposed Development Site.

Assessment Periods

- 2.9 The measured data were separated into the quiet day and night periods defined by ARWTN. Measurements outside these periods were not used to derive the wind-dependent background sound level relationships.
- 2.10 For the fixed-plant assessment, the daytime and night-time data were reviewed separately taking into consideration the reference periods and contextual principles of BS 4142. This processing was undertaken independently from the derivation of the wind turbine background noise curves.

Data Validation and Exclusions

- 2.11 The acoustic and meteorological datasets were synchronised into corresponding 10-minute periods. Periods were excluded where the data were affected by:
- rainfall;
 - invalid or incomplete sound or wind data;
 - equipment disturbance or malfunction;
 - atypical local activities not representative of the prevailing acoustic environment, e.g. dawn chorus birdsong;
 - substantial contamination from existing wind turbine noise; or
 - other conditions unsuitable for deriving representative background sound levels.
- 2.12 Potentially atypical periods were identified through review of survey data, weather records and audio recordings, where available. Exclusions were applied only where there was a reasonable basis for considering the data unsuitable or unrepresentative.
- 2.13 The retained and excluded data are identified on the regression plots in **Appendix C**. It should be noted that a noise floor was detected in the data at Boghead which is visible in

the night-time data at lower wind speeds. This was determined to be related to an extraneous noise source and the equipment was moved partway through the survey to a location unaffected by the noise.

3. MEASUREMENT RESULTS

- 3.1 **Appendix C** shows the measured background noise level over a range of wind speeds for each measurement location during the quiet daytime hours and night-time periods, correlated with the standardised 10 m height wind speed. A 3rd order polynomial regression line has been plotted through the average measured noise data to derive the prevailing background noise levels.
- 3.2 The results presented in **Appendix C** also show the measured data that was excluded due to the filtering described above.
- 3.3 The resulting derived prevailing background noise levels at each location are summarised in **Table 3** and **Table 4**.

Table 3 – Measured Night Background Noise Levels, dB L_{A90}

Location & ID	Standardised 10 m Height Wind Speed, m/s							
	3	4	5	6	7	8	9	10
M1 – Whiteholm	22.7	23.9	25.8	28.2	31.1	34.3	37.7	41.3
M2 – Springhill	18.1	19.4	21.4	24.1	27.4	31.1	35.3	39.9
M3 – Boghead	26.8	27.7	28.8	30.1	31.7	33.6	35.7	38.0
M4 – Stonebriggs	22.2	23.6	25.2	26.8	28.5	30.3	32.3	34.3
M5 – Nether Guelt	20.5	22.6	25.4	28.7	32.2	35.8	39.4	42.6

Table 4 – Measured Day Background Noise Levels, dB L_{A90}

Location & ID	Standardised 10 m Height Wind Speed, m/s							
	3	4	5	6	7	8	9	10
M1 – Whiteholm	27.0	28.3	29.8	31.5	33.0	34.4	35.5	36.1
M2 – Springhill	23.1	24.9	26.9	29.0	31.0	32.6	33.5	33.6
M3 – Boghead	33.0	33.6	34.2	34.8	35.3	35.9	36.5	37.1
M4 – Stonebriggs	34.2	35.3	35.6	35.5	35.1	34.7	34.5	34.9
M5 – Nether Guelt	23.0	24.2	25.9	28.2	30.8	33.7	36.9	40.3

4. CONCLUSIONS

- 4.1 Baseline noise measurements were undertaken at five residential receptor locations in the vicinity of the Proposed Development, selected to be representative of receptor groups with the potential to experience operational noise effects.

- 4.2 The survey methodology, instrumentation, calibration procedures and data processing were undertaken in accordance with relevant good practice guidance for wind farm noise assessments. Unsuitable data were excluded from the derivation of the background noise level curves.
- 4.3 The measured baseline noise levels demonstrate a clear correlation with increasing wind speed at all monitoring locations during both quiet day and night periods, except at Stonebriggs during the daytime where noise levels did not appear to be correlated with wind speed and remained relatively constant with increasing wind speed.
- 4.4 The derived quiet day and night background noise curves are considered suitable for use in deriving operational wind turbine noise limits for the Proposed Development, as set out in **Chapter 9** and **Technical Appendix 9-3**.

APPENDIX A DESCRIPTION OF MEASUREMENT LOCATIONS

M1 – Whiteholm

The monitoring position was in the rear garden of a farmhouse, accessed from the same track as Springhill and surrounded by livestock fields. The observed sound environment included wind through fields and vegetation, birdsong, sheep and cattle in a nearby shed. A telehandler passed during installation.



M2 – Springhill

The monitoring position was within the walled rear garden of a farmhouse at the end of a long track, surrounded by livestock fields. The observed sound environment comprised wind through fields and vegetation, birdsong and sheep in nearby fields.



M3 – Boghead

The monitoring position was at a large farm and homestead just off the A70 Muirkirk Road, near a telecommunications mast. The observed sound environment included birdsong, wind across the fields and occasional passing vehicles.



M4 – Stonebriggs

The monitoring position was in the rear garden of a house within the T French & Sons yard. The observed sound environment included birdsong, road traffic and occasional vehicle pass-bys, activity in the adjoining yard and workshops, including music or radio, voices, parked and moving cars, and mechanical or operational noise, as well as dogs barking and wind.



M5 – Nether Guelt

The monitoring position was within the stone-walled garden of a large rural property with several farm buildings, south of Whiteholm and Springhill. It was placed as far from trees as reasonably practicable, with alternative positions constrained by livestock, field use and other noise sources. Sounds observed during installation included dogs barking, insects or bees, and birdsong.



APPENDIX B CALIBRATION CERTIFICATES



CERTIFICATE OF CALIBRATION

Date of Issue: 15 April 2026

Certificate Number: TCRT26/2260

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

Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems

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Approved Signatory

K. Mistry

Customer Hayes McKenzie Partnership
Unit 3
Oakridge Office Park
Whaddon
Salisbury
SP5 3HT

Order No. 1001/357
Description Sound Level Meter / Pre-amp / Microphone / Associated Calibrator
Identification

Manufacturer	Instrument	Type	Serial No. / Version
Rion	Sound Level Meter	NL-52	01032451 (HMP55)
Rion	Firmware		2.0
Rion	Pre Amplifier	NH-25	32479
Rion	Microphone	UC-59	05842
Rion	Calibrator	NC-75	34334830
	Calibrator adaptor type if applicable		NC-75-022

Performance Class 1

Test Procedure TP 2.SLM 61672-3 TPS-49

Procedures from IEC 61672-3:2006 were used to perform the periodic tests.

Pattern Approved to IEC 61672-1:2002 YES **Approval Number** 21.21 / 13.02

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 23 March 2026

ANV Job No. TRAC26/03686

Date Calibrated 15 April 2026

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. As public evidence was available, from an independent testing organisation responsible for approving the results of pattern evaluation tests performed in accordance with IEC 61672-2:2003, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2002, the sound level meter submitted for testing conforms to the class 1 requirements of IEC 61672-1:2002.

Previous Certificate	Dated	Certificate No.	Laboratory
	19 March 2024	TCRT24/1249	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.

CERTIFICATE OF CALIBRATION



Certificate Number

TCRT26/2260

Page 2 of 2 Pages

Sound Level Meter Instruction manual and data used to adjust the sound levels indicated.

SLM instruction manual title	Sound Level Meter	NL-42 / NL-52
SLM instruction manual ref / issue		11-03
SLM instruction manual source	Manufacturer	
Internet download date if applicable	N/A	
Case corrections available	Yes	
Uncertainties of case corrections	Yes	
Source of case data	Manufacturer	
Wind screen corrections available	Yes	
Uncertainties of wind screen corrections	Yes	
Source of wind screen data	Manufacturer	
Mic pressure to free field corrections	Yes	
Uncertainties of Mic to F.F. corrections	Yes	
Source of Mic to F.F. corrections	Manufacturer	
Total expanded uncertainties within the requirements of IEC 61672-1:2002	Yes	
Specified or equivalent Calibrator	Specified	
Customer or Lab Calibrator	Lab Calibrator	
Calibrator adaptor type if applicable	NC-75-022	
Calibrator cal. date	31 March 2026	
Calibrator cert. number	UCRT26/3209	
Calibrator cal cert issued by	ANV Measurement Systems	
Calibrator SPL @ STP	93.98	dB Calibration reference sound pressure level
Calibrator frequency	1000.00	Hz Calibration check frequency
Reference level range	25 - 130	dB

Accessories used or corrected for during calibration - Extension Cable (No Wind Shield)

Note - if a pre-amp extension cable is listed then it was used between the SLM and the pre-amp.

Environmental conditions during tests	Start	End	
Temperature	23.00	22.93	± 0.30 °C
Humidity	45.5	44.5	± 3.00 %RH
Ambient Pressure	100.25	100.27	± 0.03 kPa

Response to associated Calibrator at the environmental conditions above.

Initial indicated level	94.0	dB	Adjusted indicated level	94.0	dB
The uncertainty of the associated calibrator supplied with the sound level meter ±				0.10	dB

Self Generated Noise This test is currently not performed by this Lab.

Microphone installed (if requested by customer) = Less Than	N/A	dB	A Weighting
Uncertainty of the microphone installed self generated noise ±	N/A	dB	

Microphone replaced with electrical input device - UR = Under Range indicated

Weighting	A	C	Z
	15.0	19.9	26.1
	dB	dB	dB
	UR	UR	UR

Uncertainty of the electrical self generated noise ± 0.12 dB

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with the Guide to the Expression of Uncertainty in Measurement published by ISO.

For the test of the frequency weightings as per paragraph 12. of IEC 61672-3:2006 the actual microphone free field response was used.

The acoustical frequency tests of a frequency weighting as per paragraph 11 of IEC 61672-3:2006 were carried out using an electrostatic actuator.

END

Calibrated by: TK

R 2

Additional Comments

Prior to calibration the meter was realigned (2.5 dB drift).



CERTIFICATE OF CALIBRATION

Date of Issue: 15 January 2026

Certificate Number: TCRT26/2010

Issued by:

ANV Measurement Systems

Beaufort Court

17 Roebuck Way

Milton Keynes MK5 8HL

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Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems

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Approved Signatory

K. Mistry

Customer
Hayes McKenzie Partnership
Unit 3
Oakridge Office Park
Whaddon
Salisbury
SP5 3HT

Order No. 1001/348

Description Sound Level Meter / Pre-amp / Microphone / Associated Calibrator

Identification

Manufacturer	Instrument	Type	Serial No. / Version
Rion	Sound Level Meter	NL-52	00810320 (HMP 37)
Rion	Firmware		2.0
Rion	Pre Amplifier	NH-25	98923
Rion	Microphone	UC-59	18638
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 tests.

Pattern Approved to IEC 61672-1:2002 YES **Approval Number** 21.21 / 13.02

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 09 January 2026

ANV Job No. TRAC26/01569

Date Calibrated 15 January 2026

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. As public evidence was available, from an independent testing organisation responsible for approving the results of pattern evaluation tests performed in accordance with IEC 61672-2:2003, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2002, the sound level meter submitted for testing conforms to the class 1 requirements of IEC 61672-1:2002.

Previous Certificate	Dated	Certificate No.	Laboratory
	10 January 2024	TCRT24/1031	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.

CERTIFICATE OF CALIBRATION



Certificate Number

TCRT26/2010

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Sound Level Meter Instruction manual and data used to adjust the sound levels indicated.

SLM instruction manual title	Sound Level Meter	NL-42 / NL-52
SLM instruction manual ref / issue		11-03
SLM instruction manual source	Manufacturer	
Internet download date if applicable	N/A	
Case corrections available	Yes	
Uncertainties of case corrections	Yes	
Source of case data	Manufacturer	
Wind screen corrections available	Yes	
Uncertainties of wind screen corrections	Yes	
Source of wind screen data	Manufacturer	
Mic pressure to free field corrections	Yes	
Uncertainties of Mic to F.F. corrections	Yes	
Source of Mic to F.F. corrections	Manufacturer	
Total expanded uncertainties within the requirements of IEC 61672-1:2002	Yes	
Specified or equivalent Calibrator	Specified	
Customer or Lab Calibrator	Lab Calibrator	
Calibrator adaptor type if applicable	NC-74-002	
Calibrator cal. date	17 December 2025	
Calibrator cert. number	UCRT25/2751	
Calibrator cal cert issued by	ANV Measurement Systems	
Calibrator SPL @ STP	94.03	dB Calibration reference sound pressure level
Calibrator frequency	1002.03	Hz Calibration check frequency
Reference level range	25 - 130	dB

Accessories used or corrected for during calibration - Extension Cable (No Wind Shield)

Note - if a pre-amp extension cable is listed then it was used between the SLM and the pre-amp.

Environmental conditions during tests	Start	End	
Temperature	23.66	23.77	± 0.30 °C
Humidity	43.9	44.4	± 3.00 %RH
Ambient Pressure	98.84	98.80	± 0.03 kPa

Response to associated Calibrator at the environmental conditions above.

Initial indicated level	94.1	dB	Adjusted indicated level	94.0	dB
The uncertainty of the associated calibrator supplied with the sound level meter ±				0.10	dB

Self Generated Noise This test is currently not performed by this Lab.

Microphone installed (if requested by customer) = Less Than N/A dB A Weighting

Uncertainty of the microphone installed self generated noise ± N/A dB

Microphone replaced with electrical input device - UR = Under Range indicated

Weighting	A	C	Z
	11.8	15.9	21.3
	dB	dB	dB
	UR	UR	UR

Uncertainty of the electrical self generated noise ± 0.12 dB

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor $k=2$, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with the Guide to the Expression of Uncertainty in Measurement published by ISO.

For the test of the frequency weightings as per paragraph 12. of IEC 61672-3:2006 the actual microphone free field response was used.

The acoustical frequency tests of a frequency weighting as per paragraph 11 of IEC 61672-3:2006 were carried out using an electrostatic actuator.

END

Calibrated by: K. Zablocki

R 1

Additional Comments

None



CERTIFICATE OF CALIBRATION

Date of Issue: 23 July 2024

Certificate Number: TCRT24/1573

Issued by:

ANV Measurement Systems

Beaufort Court

17 Roebuck Way

Milton Keynes MK5 8HL

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Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems

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Approved Signatory

K. Mistry

Customer
Hayes McKenzie Partnership Ltd
Unit 3
Oakridge Office Park
Whaddon
Salisbury
SP5 3HT

Order No. 1001/312

Description Sound Level Meter / Pre-amp / Microphone / Associated Calibrator

Identification	Manufacturer	Instrument	Type	Serial No. / Version
	Rion	Sound Level Meter	NL-52	00921232 [HMP57]
	Rion	Firmware		2.0
	Rion	Pre Amplifier	NH-25	33802
	Rion	Microphone	UC-59	25293
	Rion	Calibrator	NC-75	34334830
		Calibrator adaptor type if applicable		NC-75-022

Performance Class 1

Test Procedure TP 2.SLM 61672-3 TPS-49

Procedures from IEC 61672-3:2006 were used to perform the periodic tests.

Type Approved to IEC 61672-1:2002 YES **Approval Number** 21.21 / 13.02

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 01 July 2024

ANV Job No. TRAC24/07322

Date Calibrated 23 July 2024

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. As public evidence was available, from an independent testing organisation responsible for approving the results of pattern evaluation tests performed in accordance with IEC 61672-2:2003, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2002, the sound level meter submitted for testing conforms to the class 1 requirements of IEC 61672-1:2002.

Previous Certificate	Dated	Certificate No.	Laboratory
	28 July 2022	TCRT22/1474	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.

CERTIFICATE OF CALIBRATION



Certificate Number

TCRT24/1573

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Sound Level Meter Instruction manual and data used to adjust the sound levels indicated.

SLM instruction manual title	Sound Level Meter	NL-42 / NL-52
SLM instruction manual ref / issue		11-03
SLM instruction manual source	Manufacturer	
Internet download date if applicable	N/A	
Case corrections available	Yes	
Uncertainties of case corrections	Yes	
Source of case data	Manufacturer	
Wind screen corrections available	Yes	
Uncertainties of wind screen corrections	Yes	
Source of wind screen data	Manufacturer	
Mic pressure to free field corrections	Yes	
Uncertainties of Mic to F.F. corrections	Yes	
Source of Mic to F.F. corrections	Manufacturer	
Total expanded uncertainties within the requirements of IEC 61672-1:2002	Yes	
Specified or equivalent Calibrator	Specified	
Customer or Lab Calibrator	Lab Calibrator	
Calibrator adaptor type if applicable	NC-75-022	
Calibrator cal. date	10 July 2024	
Calibrator cert. number	UCRT24/1958	
Calibrator cal cert issued by	ANV Measurement Systems	
Calibrator SPL @ STP	94.00	dB Calibration reference sound pressure level
Calibrator frequency	1000.00	Hz Calibration check frequency
Reference level range	25 - 130	dB

Accessories used or corrected for during calibration - Extension Cable (No Wind Shield)

Note - if a pre-amp extension cable is listed then it was used between the SLM and the pre-amp.

Environmental conditions during tests	Start	End	
Temperature	24.43	24.41	± 0.30 °C
Humidity	56.9	57.3	± 3.00 %RH
Ambient Pressure	100.96	100.98	± 0.03 kPa

Response to associated Calibrator at the environmental conditions above.

Initial indicated level	94.0	dB	Adjusted indicated level	94.0	dB
The uncertainty of the associated calibrator supplied with the sound level meter ±				0.10	dB

Self Generated Noise This test is currently not performed by this Lab.

Microphone installed (if requested by customer) = Less Than N/A dB A Weighting

Uncertainty of the microphone installed self generated noise ± N/A dB

Microphone replaced with electrical input device - UR = Under Range indicated

Weighting	A	C	Z
	12.3	16.0	21.6
	dB	dB	dB
	UR	UR	UR

Uncertainty of the electrical self generated noise ± 0.12 dB

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor $k=2$, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with the Guide to the Expression of Uncertainty in Measurement published by ISO.

For the test of the frequency weightings as per paragraph 12. of IEC 61672-3:2006 the actual microphone free field response was used.

The acoustical frequency tests of a frequency weighting as per paragraph 11 of IEC 61672-3:2006 were carried out using an electrostatic actuator.

END

Calibrated by: K. Zablocki

R 1

Additional Comments

Prior to calibration the instrument's microphone and pre-amp were replaced and the meter was realigned.



CERTIFICATE OF CALIBRATION

Date of Issue: 24 October 2024

Certificate Number: TCRT24/1782

Issued by:

ANV Measurement Systems

Beaufort Court

17 Roebuck Way

Milton Keynes MK5 8HL

Telephone 01908 642846 Fax 01908 642814

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Web: www.noise-and-vibration.co.uk

Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems

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Approved Signatory

B. Bogdan

Customer
Hayes McKenzie Partnership Ltd
Unit 3
Oakridge Office Park
Whaddon
Salisbury
SP5 3HT

Order No. 1001/321

Description Sound Level Meter / Pre-amp / Microphone / Associated Calibrator

Manufacturer	Instrument	Type	Serial No. / Version
Rion	Sound Level Meter	NL-52	00620893 [HMP41]
Rion	Firmware		2.0
Rion	Pre Amplifier	NH-25	76939
Rion	Microphone	UC-59	03786
Rion	Calibrator	NC-75	34334830
	Calibrator adaptor type if applicable		NC-75-022

Performance Class 1

Test Procedure TP 2.SLM 61672-3 TPS-49

Procedures from IEC 61672-3:2006 were used to perform the periodic tests.

Type Approved to IEC 61672-1:2002 NO **Approval Number** N/A

Whilst the NL-52 is Type Approved on its own, it is not Type Approved in combination with the Hayes McKenzie 450mm wind shield.

Date Received 22 October 2024

ANV Job No. TRAC24/10453

Date Calibrated 24 October 2024

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 & wind shield combination 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
	21 October 2022	TCRT22/1647	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.

CERTIFICATE OF CALIBRATION



Certificate Number

TCRT24/1782

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Sound Level Meter Instruction manual and data used to adjust the sound levels indicated.

SLM instruction manual title	Sound Level Meter	NL-42 / NL-52
SLM instruction manual ref / issue		11-03
SLM instruction manual source	Manufacturer	
Internet download date if applicable	N/A	
Case corrections available	Yes	
Uncertainties of case corrections	Yes	
Source of case data	Manufacturer	
Wind screen corrections available	Yes	
Uncertainties of wind screen corrections	Yes	
Source of wind screen data	Manufacturer	
Mic pressure to free field corrections	Yes	
Uncertainties of Mic to F.F. corrections	Yes	
Source of Mic to F.F. corrections	Manufacturer	
Total expanded uncertainties within the requirements of IEC 61672-1:2002	Yes	
Specified or equivalent Calibrator	Specified	
Customer or Lab Calibrator	Lab Calibrator	
Calibrator adaptor type if applicable	NC-75-022	
Calibrator cal. date	22 October 2024	
Calibrator cert. number	UCRT24/2394	
Calibrator cal cert issued by	ANV Measurement Systems	
Calibrator SPL @ STP	94.02	dB Calibration reference sound pressure level
Calibrator frequency	1000.00	Hz Calibration check frequency
Reference level range	25 - 130	dB

Accessories used or corrected for during calibration - Extension Cable (No Wind Shield)

A pre-amp extension cable was used between the SLM and the pre-amp. The SLM was set for WS-15 compensation.

Environmental conditions during tests	Start	End	
Temperature	23.20	23.30	± 0.30 °C
Humidity	48.4	51.3	± 3.00 %RH
Ambient Pressure	100.95	100.76	± 0.03 kPa

Response to associated Calibrator at the environmental conditions above.

Initial indicated level	94.1	dB	Adjusted indicated level	94.0	dB
The uncertainty of the associated calibrator supplied with the sound level meter ±				0.10	dB

Self Generated Noise This test is currently not performed by this Lab.

Microphone installed (if requested by customer) = Less Than	N/A	dB A Weighting
Uncertainty of the microphone installed self generated noise ±	N/A	dB

Microphone replaced with electrical input device - UR = Under Range indicated

Weighting	A	C	Z
	12.1	16.2	23.1
	dB	dB	dB
	UR	UR	UR

Uncertainty of the electrical self generated noise ± 0.12 dB

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with the Guide to the Expression of Uncertainty in Measurement published by ISO.

For the test of the frequency weightings as per paragraph 12. of IEC 61672-3:2006 the actual microphone free field response was used.

The acoustical frequency tests of a frequency weighting as per paragraph 11 of IEC 61672-3:2006 were carried out using an electrostatic actuator.

END

Calibrated by: B. Bogdan

R 2

Additional Comments

The NL-52 with the Hayes McKenzie 450mm windshield has been tested as a Class 1 instrument in accordance with the customers instruction.



CERTIFICATE OF CALIBRATION

Date of Issue: 13 March 2026

Certificate Number: TCRT26/2197

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

Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems

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Approved Signatory

K. Mistry

Customer
Hayes McKenzie Partnership
Unit 3
Oakridge Office Park
Whaddon
Salisbury
SP5 3HT

Order No. 1001/355

Description Sound Level Meter / Pre-amp / Microphone / Associated Calibrator

Identification	Manufacturer	Instrument	Type	Serial No. / Version
	Rion	Sound Level Meter	NL-52	00231708 (HMP49)
	Rion	Firmware		2.0
	Rion	Pre Amplifier	NH-25	21656
	Rion	Microphone	UC-59	16860
	Rion	Calibrator	NC-75	34334830
		Calibrator adaptor type if applicable		NC-75-022

Performance Class 1

Test Procedure TP 2.SLM 61672-3 TPS-49

Procedures from IEC 61672-3:2006 were used to perform the periodic tests.

Pattern Approved to IEC 61672-1:2002 YES **Approval Number** 21.21 / 13.02

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 06 March 2026

ANV Job No. TRAC26/03665

Date Calibrated 13 March 2026

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. As public evidence was available, from an independent testing organisation responsible for approving the results of pattern evaluation tests performed in accordance with IEC 61672-2:2003, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2002, the sound level meter submitted for testing conforms to the class 1 requirements of IEC 61672-1:2002.

Previous Certificate	Dated	Certificate No.	Laboratory
	05 March 2024	UCRT24/1372	0653

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.

CERTIFICATE OF CALIBRATION



Certificate Number

TCRT26/2197

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Sound Level Meter Instruction manual and data used to adjust the sound levels indicated.

SLM instruction manual title	Sound Level Meter	NL-42 / NL-52
SLM instruction manual ref / issue		11-03
SLM instruction manual source	Manufacturer	
Internet download date if applicable	N/A	
Case corrections available	Yes	
Uncertainties of case corrections	Yes	
Source of case data	Manufacturer	
Wind screen corrections available	Yes	
Uncertainties of wind screen corrections	Yes	
Source of wind screen data	Manufacturer	
Mic pressure to free field corrections	Yes	
Uncertainties of Mic to F.F. corrections	Yes	
Source of Mic to F.F. corrections	Manufacturer	
Total expanded uncertainties within the requirements of IEC 61672-1:2002	Yes	
Specified or equivalent Calibrator	Specified	
Customer or Lab Calibrator	Lab Calibrator	
Calibrator adaptor type if applicable	NC-75-022	
Calibrator cal. date	24 February 2026	
Calibrator cert. number	UCRT26/3058	
Calibrator cal cert issued by	ANV Measurement Systems	
Calibrator SPL @ STP	93.99	dB Calibration reference sound pressure level
Calibrator frequency	1000.00	Hz Calibration check frequency
Reference level range	25 - 130	dB

Accessories used or corrected for during calibration - Extension Cable (No Wind Shield)

Note - if a pre-amp extension cable is listed then it was used between the SLM and the pre-amp.

Environmental conditions during tests	Start	End	
Temperature	22.87	22.71	± 0.30 °C
Humidity	41.4	43.7	± 3.00 %RH
Ambient Pressure	99.01	99.02	± 0.03 kPa

Response to associated Calibrator at the environmental conditions above.

Initial indicated level	94.2	dB	Adjusted indicated level	94.0	dB
The uncertainty of the associated calibrator supplied with the sound level meter ±				0.10	dB

Self Generated Noise This test is currently not performed by this Lab.

Microphone installed (if requested by customer) = Less Than N/A dB A Weighting

Uncertainty of the microphone installed self generated noise ± N/A dB

Microphone replaced with electrical input device - UR = Under Range indicated

Weighting	A	C	Z
	11.4	16.3	21.8

Uncertainty of the electrical self generated noise ± 0.12 dB

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor $k=2$, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with the Guide to the Expression of Uncertainty in Measurement published by ISO.

For the test of the frequency weightings as per paragraph 12. of IEC 61672-3:2006 the actual microphone free field response was used.

The acoustical frequency tests of a frequency weighting as per paragraph 11 of IEC 61672-3:2006 were carried out using an electrostatic actuator.

END

Calibrated by: K. Zablocki

R 3

Additional Comments

None



CERTIFICATE OF CALIBRATION



0653

Date of Issue: 09 June 2025

Certificate Number: UCRT25/1857

Calibrated at & Certificate 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

Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems

Page 1 of 2 Pages	
Approved Signatory	
K. Mistry	

Customer Hayes McKenzie Partnership Ltd
Unit 3
Oakridge Office Park
Whaddon
Salisbury
SP5 3HT

Order No. 1001/336

Test Procedure Procedure TP 1 Calibration of Sound Calibrators

Description Acoustic Calibrator

Identification	Manufacturer	Instrument	Model	Serial No.
	Brüel & Kjær	Calibrator	4231	3009009 SAL 4

The calibrator has been tested as specified in Annex B of IEC 60942:2003. As public evidence was available from a testing organisation (PTB) responsible for approving the results of pattern evaluation tests, to demonstrate that the model of sound calibrator fully conformed to the requirements for pattern evaluation described in Annex A of IEC 60942:2003, the sound calibrator tested is considered to conform to all the class 1 requirements of IEC 60942:2003.

ANV Job No. UKAS25/06444

Date Received 06 June 2025

Date Calibrated 09 June 2025

Previous Certificate	Dated	07 June 2024
	Certificate No.	UCRT24/1835
	Laboratory	0653

This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service. It provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.

CERTIFICATE OF CALIBRATION	Certificate Number UCRT25/1857
UKAS Accredited Calibration Laboratory No. 0653	Page 2 of 2 Pages

Measurements

The sound pressure level generated by the calibrator in its WS2 configuration was measured five times by the Insert Voltage Method using a microphone as detailed below. The mean of the results obtained is shown below. It is corrected to the standard atmospheric pressure of 101.3 kPa (1013 mBar) using original manufacturers information.

Test Microphone	<i>Manufacturer</i>	<i>Type</i>
	Brüel & Kjær	4134

Results

The level of the calibrator output under the conditions outlined above was

94.20 ± 0.10 dB rel 20 µPa

Functional Tests and Observations

The frequency of the sound produced was	999.98 ± 0.12 Hz
The total distortion was	0.38 ± 0.06 % Distortion

During the measurements environmental conditions were

Temperature	22	to	23	°C
Relative Humidity	48	to	54	%
Barometric Pressure	100.9	to	101.0	kPa

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

The uncertainties refer to the measured values only with no account being taken of the ability of the instrument to maintain its calibration.

A small correction factor may need to be applied to the sound pressure level quoted above if the device is used to calibrate a sound level meter which is fitted with a free-field response microphone. See manufacturers handbook for details.

END

Note:

Calibrator adjusted prior to calibration?	NO
Initial Level	N/A dB
Initial Frequency	N/A Hz

Additional Comments The results on this certificate only relate to the items calibrated as identified above.
None

Calibrated by: TK/BB

R 2

APPENDIX C APPENDIX D. DERIVED PREVAILING BASELINE NOISE LEVELS









