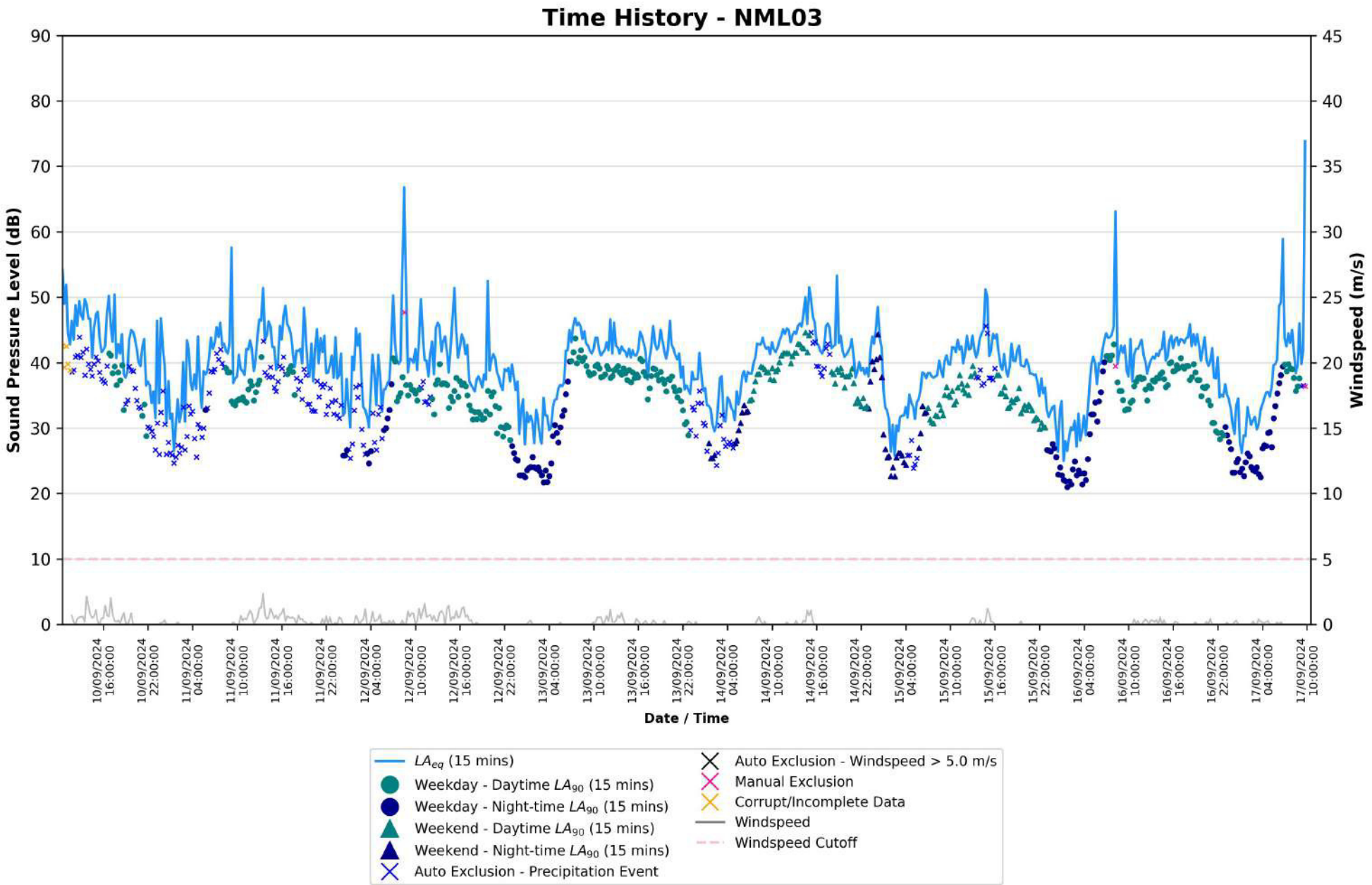
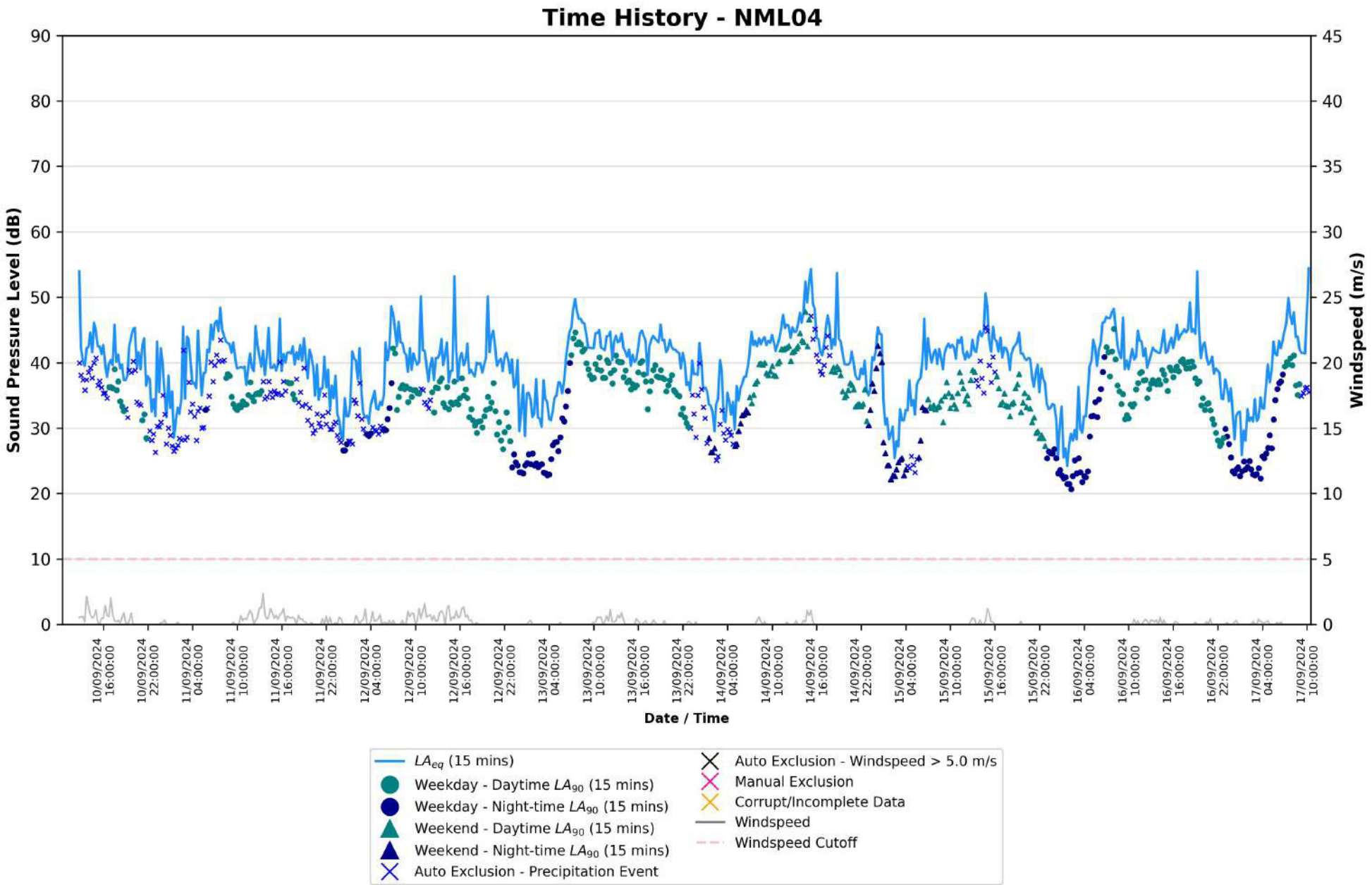
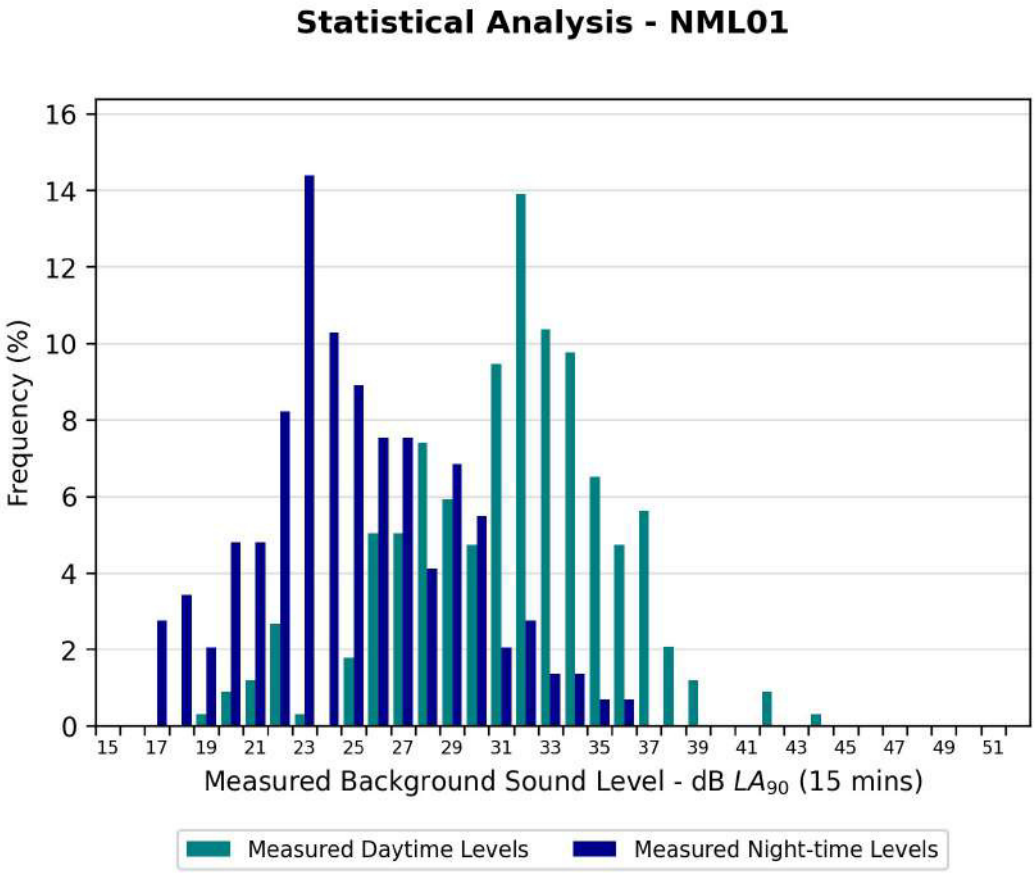
16819 - Fyrish BESS - Measured Sound Levels:

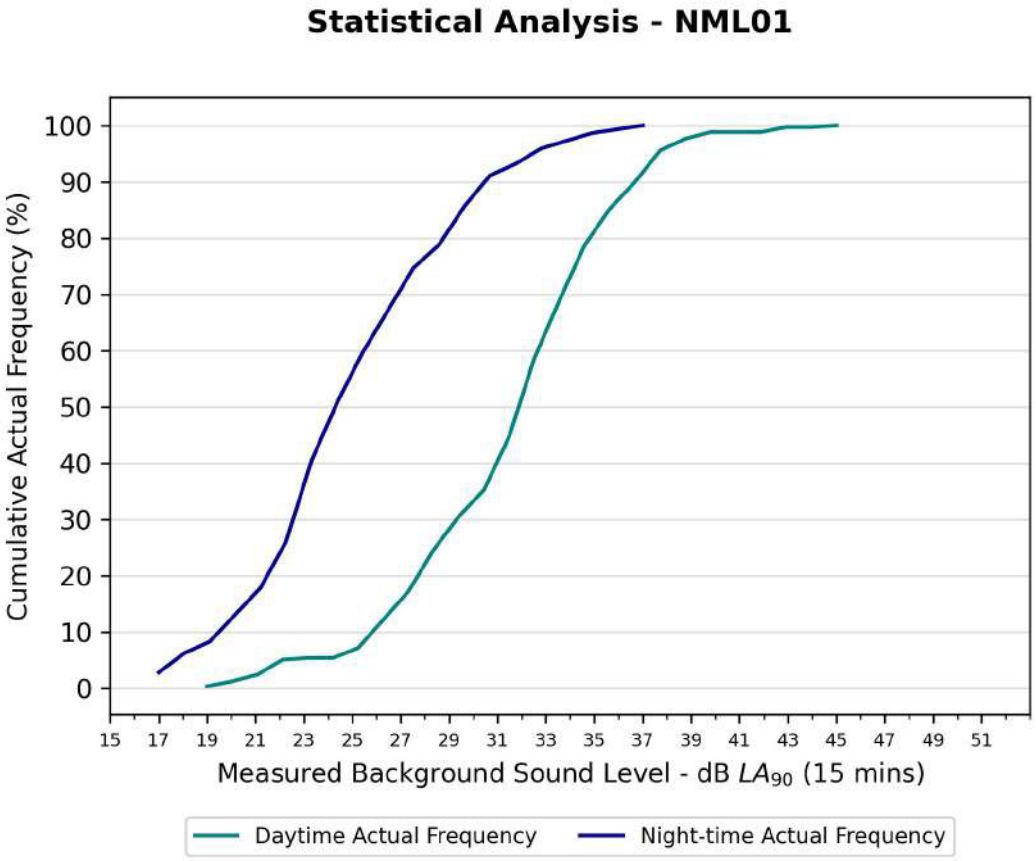


16819 - Fyrish BESS - Measured Sound Levels:

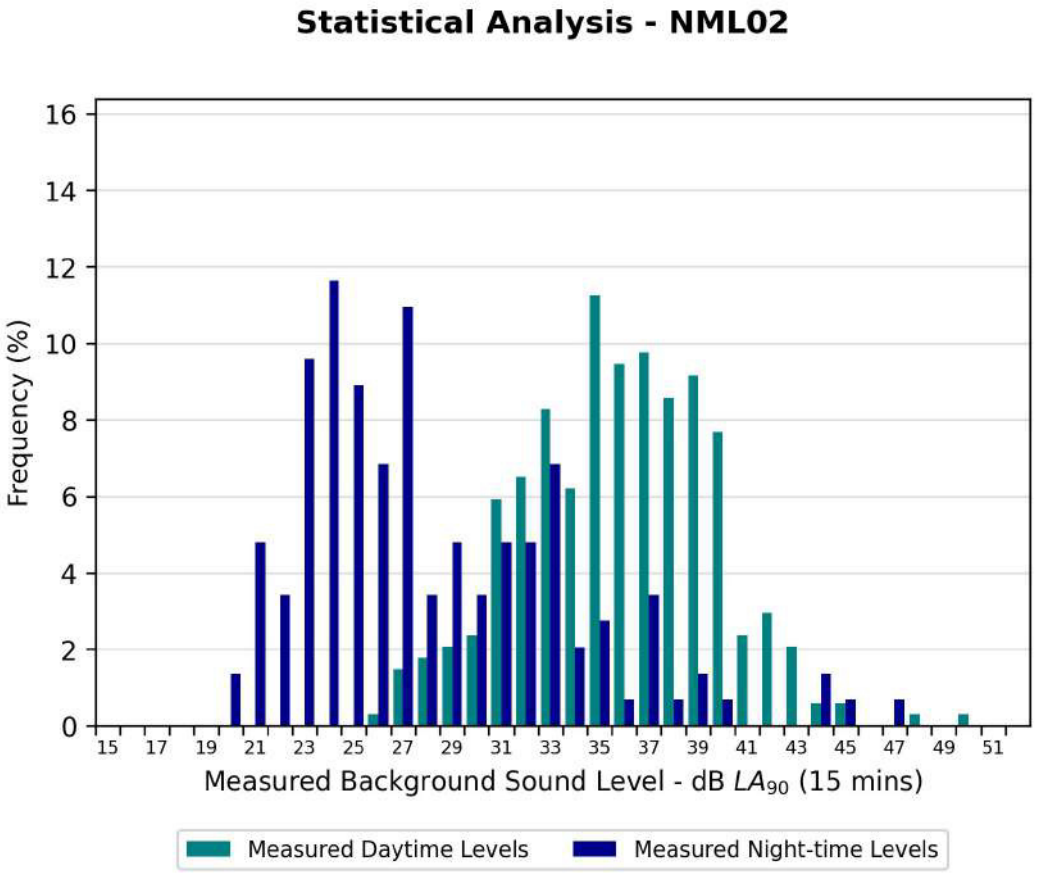


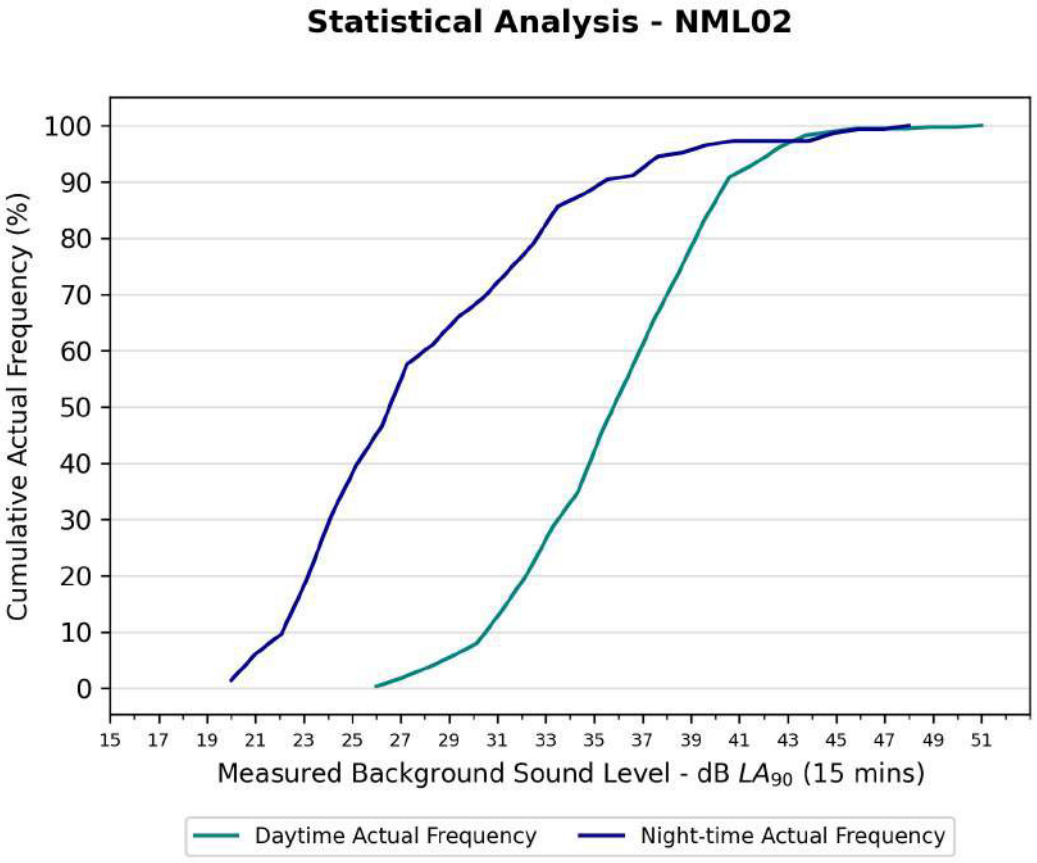
16819 - Fyrish BESS - Measured Sound Levels:



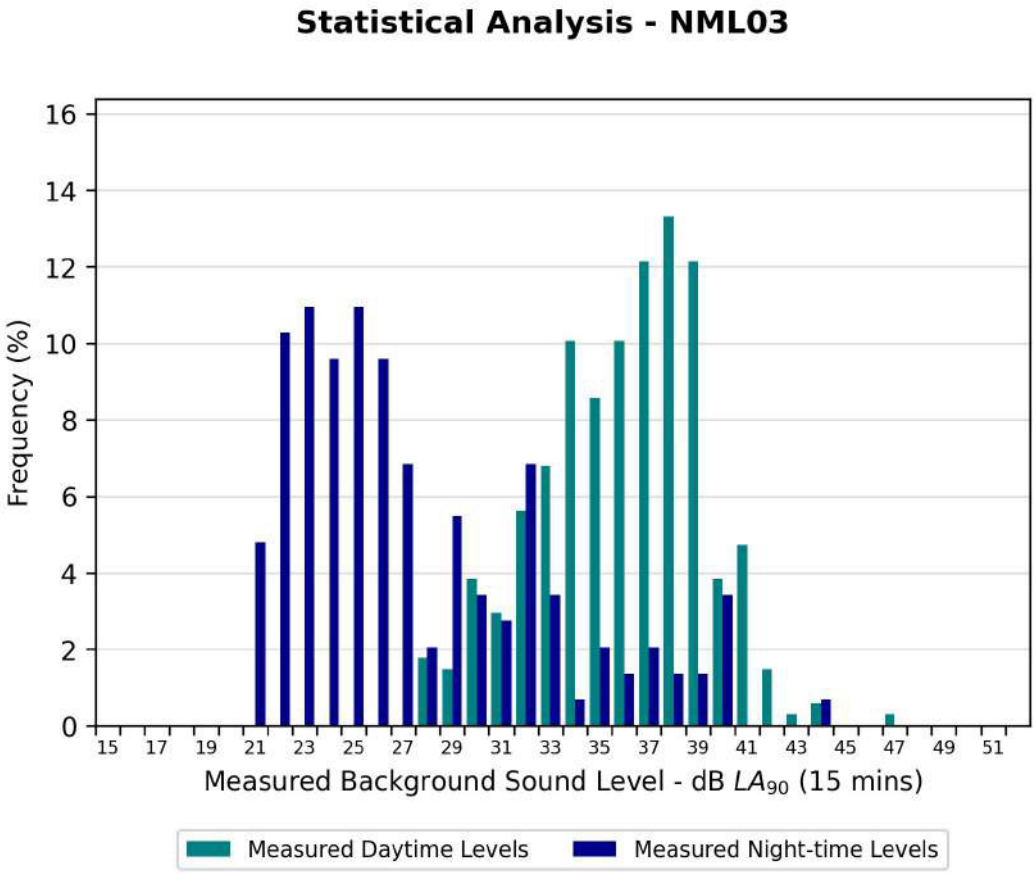


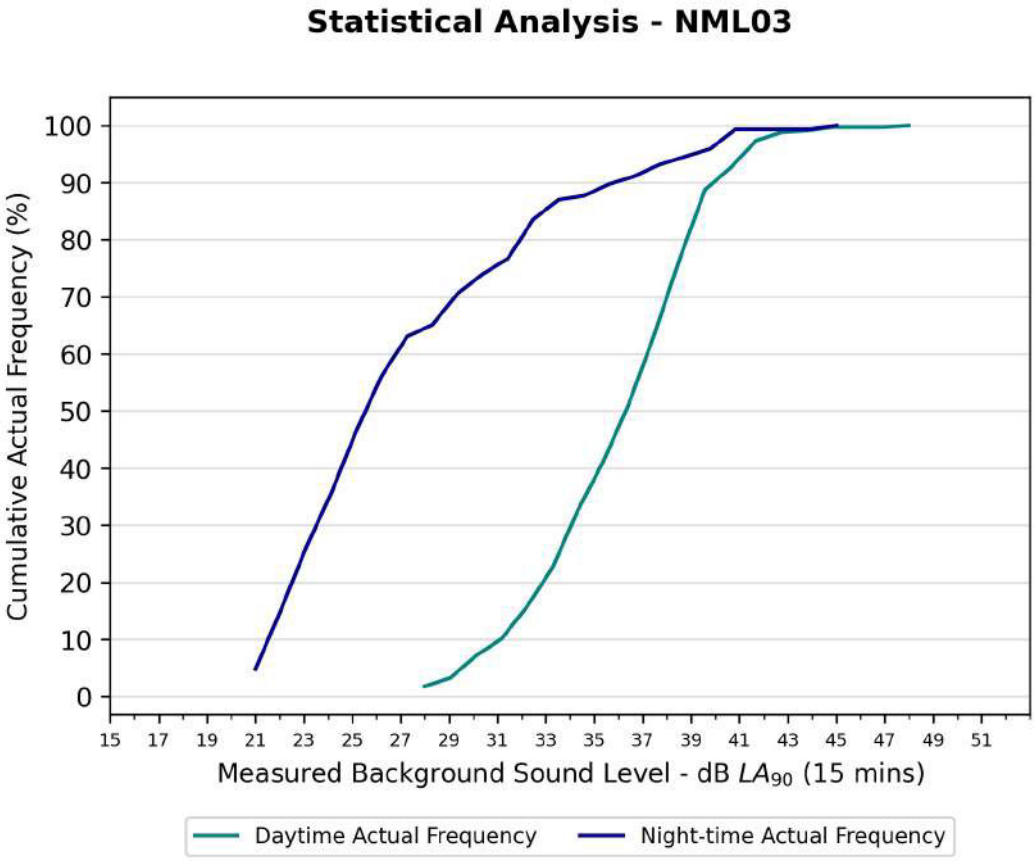
16819 - Fyrish BESS - Measured Sound Levels:



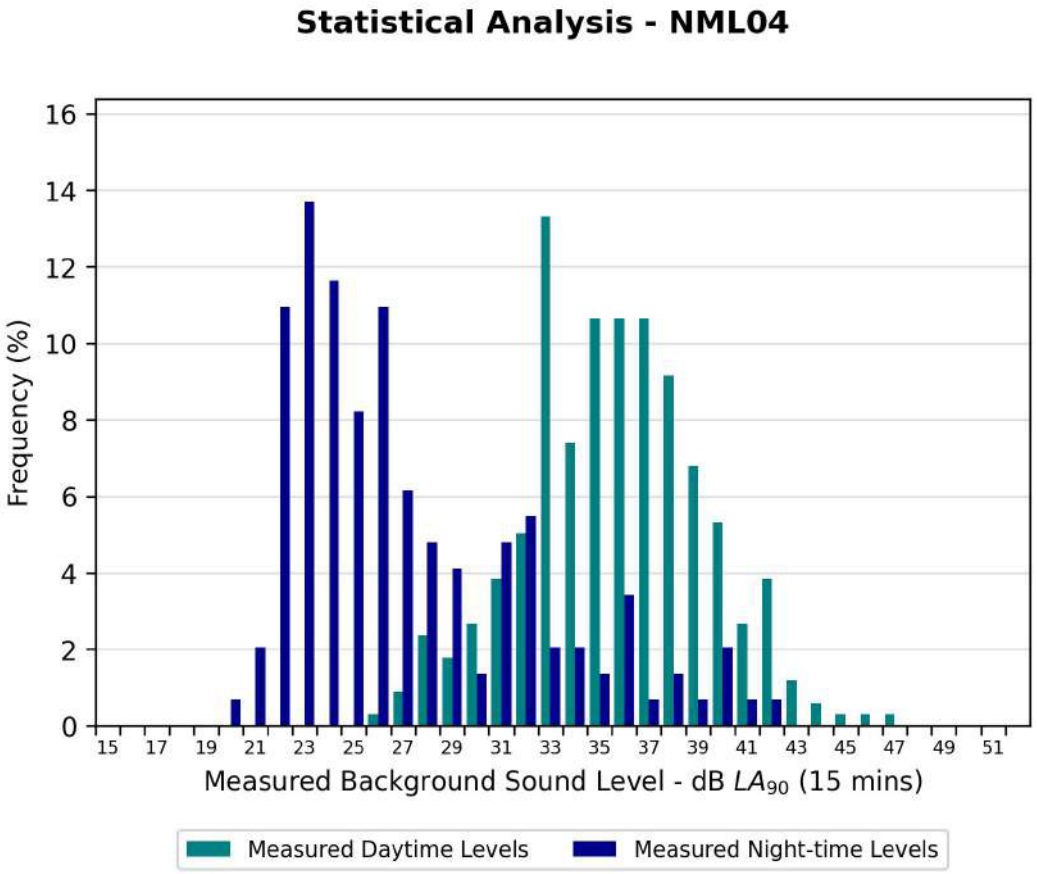


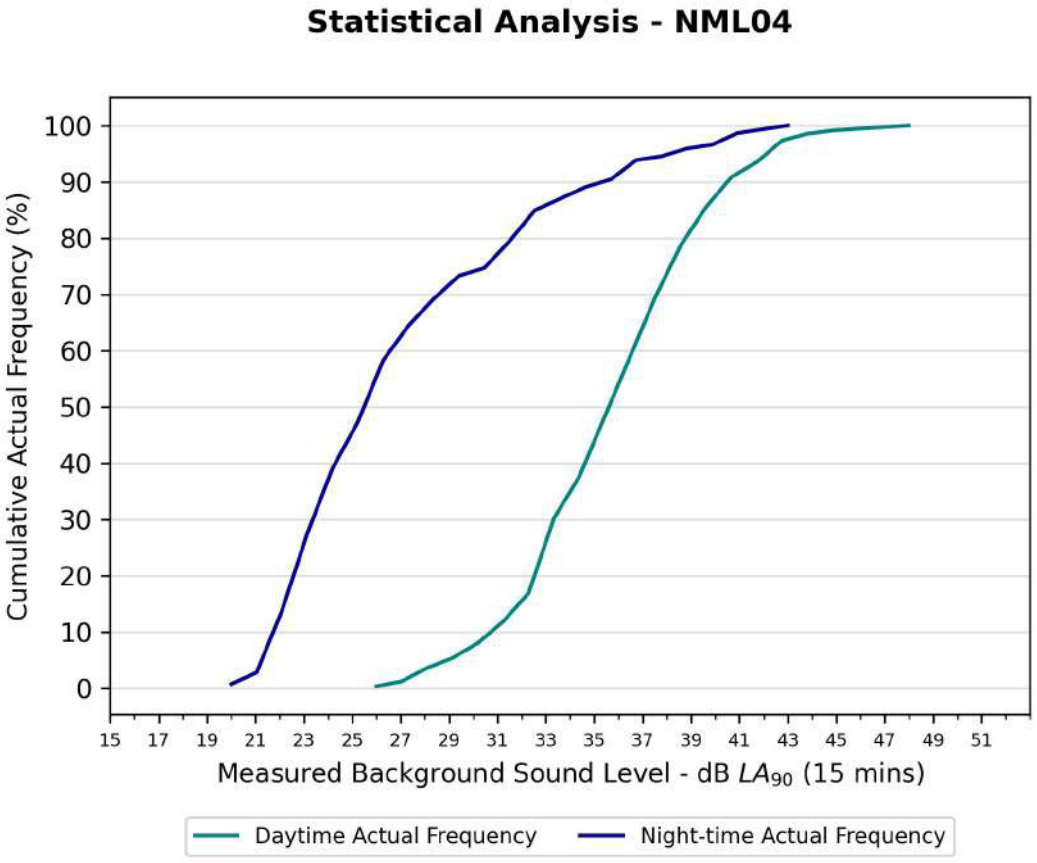
16819 - Fyrish BESS - Measured Sound Levels:





16819 - Fyrish BESS - Measured Sound Levels:





16819 - Fyrish BESS - Measured Sound Levels:

Relevant Statistics

NML01

		COUNT	MEAN	MEDIAN	RANGE
DAYTIME	LA90 (15 MINS)	334	32	32	20 - 43
	LAEQ (15 MINS)	334	38	39	24 - 59
NIGHT-TIME	LA90 (15 MINS)	146	25	25	17 - 37
	LAEQ (15 MINS)	146	30	28	18 - 50

NML02

		COUNT	MEAN	MEDIAN	RANGE
DAYTIME	LA90 (15 MINS)	338	36	36	26 - 51
	LAEQ (15 MINS)	338	42	42	31 - 60
NIGHT-TIME	LA90 (15 MINS)	146	29	27	21 - 48
	LAEQ (15 MINS)	146	34	33	24 - 52

16819 - Fyrish BESS - Measured Sound Levels:

Relevant Statistics

NML03

		COUNT	MEAN	MEDIAN	RANGE
DAYTIME	LA90 (15 MINS)	336	36	37	28 - 45
	LAEQ (15 MINS)	336	42	42	35 - 58
NIGHT-TIME	LA90 (15 MINS)	146	28	26	21 - 44
	LAEQ (15 MINS)	146	34	33	25 - 59

NML04

		COUNT	MEAN	MEDIAN	RANGE
DAYTIME	LA90 (15 MINS)	338	36	36	27 - 48
	LAEQ (15 MINS)	338	42	42	34 - 54
NIGHT-TIME	LA90 (15 MINS)	146	28	26	21 - 43
	LAEQ (15 MINS)	146	35	34	24 - 49

Noise Monitoring Field Data Sheet

MONITORING LOCATION

Location Name	NML01 – Fyrish House
Description	Representative of receptors to the northwest of the Proposed Development
Comments	Measurements were undertaken by TNEI to establish the baseline sound levels at the noise sensitive receptors surrounding the proposed Fyrish BESS site. The noise meter was located in a free field position, greater than 3.5 m from any hard reflecting surface excluding the ground.
Approximate National Grid Reference	261831, 869003
Survey Period	10/09/2024 – 17/09/2024
Noise sources noted during installation, maintenance and removal	8/8 oktas, raining. Main noise sources are rain induced and wind in foliage. Road noise audible.
Notes	Advanced Rion meter used. Kestrel and Rain Gauge installed.

NOISE MONITORING EQUIPMENT DETAILS

Survey	Kit Number	Model	Serial Number	Last Calibrated/ Conformance Checked
Sound Level Meter	SLM 030	NL-52	00643022	14/02/2024
Pre-Amplifier	SLM 030	NH-25	43050	14/02/2024
Microphone	SLM 030	UC-59	06802	14/02/2024
Calibrator	Cal 002	Rion NC-74	34973250	18/12/2023

DATA

File Name	Start Time	End Time	Cal. at Start	Cal. at End	Drift	Observations
0101	11:45 BST 10/09/2024	10:38 BST 17/09/2024	94.0	94.0	0.0	10/09/2024: Birdsong, distant road traffic, rain induced noise, light wind in foliage 17/09/2024 Birdsong, distant road traffic, looks like grass has been cut and kit moved slightly

PHOTOGRAPHS

North

East

South

West

Noise Monitoring Field Data Sheet

MONITORING LOCATION

Location Name	NML02 – South of The Dairy House
Description	Representative of receptors to the southwest of the Proposed Development
Comments	Measurements were undertaken by TNEI to establish the baseline sound levels at the noise sensitive receptors surrounding the proposed Fyrish BESS site. The noise meter was located in a free field position, greater than 3.5 m from any hard reflecting surface excluding the ground.
Approximate National Grid Reference	262395, 868226
Survey Period	10/09/2024 – 17/09/2024
Noise sources noted during installation, maintenance and removal	7/8 oktas. Heavy rain. Wind in foliage dominant source.
Notes	Standard Rion meter used.

NOISE MONITORING EQUIPMENT DETAILS

Survey	Kit Number	Model	Serial Number	Last Calibrated/ Conformance Checked
Sound Level Meter	SLM 058	NL-52	00721000	22/08/2024
Pre Amplifier	SLM 058	NH-25	22106	22/08/2024
Microphone	SLM 058	UC-59	21938	22/08/2024
Calibrator	Cal 002	Rion NC-74	34973250	18/12/2023

DATA

File Name	Start Time	End Time	Cal. at Start	Cal. at End	Drift	Observations
0201	11:15 BST 10/09/2024	10:27 BST 17/09/2024	94.0	94.1	0.1	10/09/2024: Birdsong, distant road traffic, heavy rain. Wind in foliage dominant source. 17/09/2024 Distant road noise, bird song, light wind in foliage

PHOTOGRAPHS

North

East

South

West

Noise Monitoring Field Data Sheet

MONITORING LOCATION

Location Name	NML03 – Lock Cottage (Clashnabuiac)
Description	Representative of receptors to the south of the Proposed Development
Comments	Measurements were undertaken by TNEI to establish the baseline sound levels at the noise sensitive receptors surrounding the proposed Fyrish BESS site. The noise meter was located in a free field position, greater than 3.5 m from any hard reflecting surface excluding the ground.
Approximate National Grid Reference	262990, 868582
Survey Period	10/09/2024 – 17/09/2024
Noise sources noted during installation, maintenance and removal	4/8 oktas. Light rain occasionally. Mostly wind in foliage. Quiet road noise in distance.
Notes	Advanced Rion meter used.

NOISE MONITORING EQUIPMENT DETAILS

Survey	Kit Number	Model	Serial Number	Last Calibrated/ Conformance Checked
Sound Level Meter	SLM 032	NL-52	00643024	03/01/2024
Pre Amplifier	SLM 032	NH-25	43052	03/01/2024
Microphone	SLM 032	UC-59	06804	03/01/2024
Calibrator	Cal 002	Rion NC-74	34973250	18/12/2023

DATA

File Name	Start Time	End Time	Cal. at Start	Cal. at End	Drift	Observations
0301	10:30 BST 10/09/2024	9:52 BST 17/09/2024	94.0	94.1	0.1	10/09/2024: Birdsong, distant road traffic. Light rain, mostly wind in foliage. 17/09/2024 Birdsong, distant road traffic, industrial machinery noise audible but not constant

PHOTOGRAPHS

North

East

South

West

Noise Monitoring Field Data Sheet

MONITORING LOCATION

Location Name	NML04 – Wester Contullich
Description	Representative of receptors to the northeast of the Proposed Development
Comments	Measurements were undertaken by TNEI to establish the baseline sound levels at the noise sensitive receptors surrounding the proposed Fyrish BESS site. The noise meter was located in a free field position, greater than 3.5 m from any hard reflecting surface excluding the ground.
Approximate National Grid Reference	263142, 869202
Survey Period	10/09/2024 – 17/09/2024
Noise sources noted during installation, maintenance and removal	Birdsong, distant road traffic, wind in foliage
Notes	Advanced Rion meter used.

NOISE MONITORING EQUIPMENT DETAILS

Survey	Kit Number	Model	Serial Number	Last Calibrated/ Conformance Checked
Sound Level Meter	SLM 055	NL-52	00520923	05/08/2024
Pre Amplifier	SLM 055	NH-25	11770	05/08/2024
Microphone	SLM 055	UC-59	21320	05/08/2024
Calibrator	Cal 002	Rion NC-74	34973250	18/12/2023

DATA

File Name	Start Time	End Time	Cal. at Start	Cal. at End	Drift	Observations
0401	12:45 BST 10/09/2024	10:15 BST 17/09/2024	94.0	94.1	0.1	10/09/2024: Birdsong. Distant road traffic. Wind in foliage 17/09/2024 Birdsong, road traffic noise dominant, light wind in foliage, distant aircraft overhead.

PHOTOGRAPHS

North

East

South

West

CERTIFICATE OF CALIBRATION

0653

Date of Issue: 18 December 2023

Certificate Number: UCRT23/2584

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

[redacted]

Customer	TNEI 7th Floor West One Forth Banks Newcastle Upon Tyne NE1 3PA
Order No.	5001
Test Procedure	Procedure TP 1 Calibration of Sound Calibrators
Description	Acoustic Calibrator

Identification

Manufacturer	*Instrument*	*Model*	*Serial No.*
Rion	Calibrator	NC-74	34973250

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.	UKAS23/12850
Date Received	14 December 2023
Date Calibrated	18 December 2023

Previous Certificate

Dated	19 January 2023
Certificate No.	UCRT23/1090
Laboratory	0653

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	*Manufacturer*	*Type*
	Brüel & Kjær	4134

Results

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

94.01 ± 0.10 dB rel 20 µPa

Functional Tests and Observations

The frequency of the sound produced was	1002.88	±	0.12 Hz
The total distortion was	1.07	±	0.08 % Distortion

During the measurements environmental conditions were

Temperature	22	to	23	°C
Relative Humidity	36	to	45	%
Barometric Pressure	101.7	to	101.8	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: [redacted]

R 1

CERTIFICATE OF CALIBRATION

Date of Issue: 14 February 2024

Certificate Number: TCRT24/1150

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

[redacted]

Customer
TNEI
7th Floor West One
Forth Banks
Newcastle Upon Tyne
NE1 3PA

Order No. 5001

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

Identification

Manufacturer	*Instrument*	*Type*	*Serial No. / Version*
Rion	Sound Level Meter	NL-52	00643022
Rion	Firmware		2.0
Rion	Pre Amplifier	NH-25	43050
Rion	Microphone	UC-59	06802
Rion	Calibrator	NC-74	34762316
	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.

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 13 February 2024 ANV Job No. TRAC24/02069

Date Calibrated 14 February 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*
	17 November 2021	214286	NSAI National Metrology Lab

CERTIFICATE OF CALIBRATION

Certificate Number
TCRT24/1150

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		Customers Calibrator
Calibrator adaptor type if applicable		NC-74-002
Calibrator cal. date		14 February 2024
Calibrator cert. number		UCRT24/1237
Calibrator cal cert issued by		ANV Measurement Systems
Calibrator SPL @ STP	94.03	dB Calibration reference sound pressure level
Calibrator frequency	1002.41	Hz Calibration check frequency
Reference level range	25 - 130	dB

Accessories used or corrected for during calibration - None
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	23.03	22.89	± 0.30 °C
Humidity	52.9	49.8	± 3.00 %RH
Ambient Pressure	100.03	100.07	± 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		
	12.9	dB	UR	16.7	dB	UR	22.3	dB	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: [redacted]

R 1

Additional Comments

The instrument was realigned due to 1.4dB drift in calibration mode.