

The Lighthouse Green Fuels Order

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Abbreviations

Abbreviation	In full
Decibel (dB)	The ratio of sound pressures which people can hear is a ratio of $10^6:1$ (one million: one). For convenience, therefore, a logarithmic measurement scale is used. The resulting parameter is called the 'sound pressure level' (L) and the associated measurement unit is the decibel (dB). As the decibel is a logarithmic ratio, the laws of logarithmic addition and subtraction apply.
dB(A)	The unit used to define a weighted sound pressure level, which correlates well with the subjective response to sound. The 'A' weighting follows the frequency response of the human ear, which is less sensitive to low and very high frequencies than it is to those in the range 500Hz to 4kHz. In some statistical descriptors the 'A' weighting forms part of a subscript, such as L_{A10} , L_{A90} , and L_{Aeq} for the 'A' weighted equivalent continuous noise level.
ES	Environmental Statement
LGF	Lighthouse Green Fuels
NSR	Noise sensitive receptor Noise (and vibration) sensitive receptors include residential properties, sensitive commercial and community uses (such as offices, educational premises, medical facilities, places of worship) and public open spaces, including public rights of way (PRoW) and sensitive ecological receptors.
SAF	Sustainable aviation fuel
SLM	Sound level meter
Sound pressure level (SPL)	The sound power emitted by a source results in pressure fluctuations in the air, which are heard as sound. The sound pressure level (L) is ten times the logarithm of the ratio of the measured sound pressure (detected by a microphone) to the reference level of 2×10^{-5} Pa (the threshold of hearing). Thus $L \text{ (dB)} = 10 \log (P_1/P_{ref})^2$ where P_{ref} , the lowest pressure detectable by the ear, is 0.00002 pascals (i.e. 2×10^{-5} Pa). The threshold of hearing is 0dB, while the threshold of pain is approximately 120dB. Normal speech is approximately 60dB _{L_A} and a change of 3dB is only just detectable. A change of 10dB is subjectively twice, or half, as loud.
Statistical noise levels	For levels of noise that vary widely with time, for example road traffic noise, it is necessary to employ an index which allows for this variation. The L_{p10} , the level exceeded for 10% of the time period under consideration and can be used for the assessment of road traffic noise (note that L_{pAeq} is used in BS 8233 for assessing traffic noise). The L_{90} , the level exceeded for 90% of the time, has been adopted to represent the background noise level. The L_1 , the level exceeded for 1% of the time, is

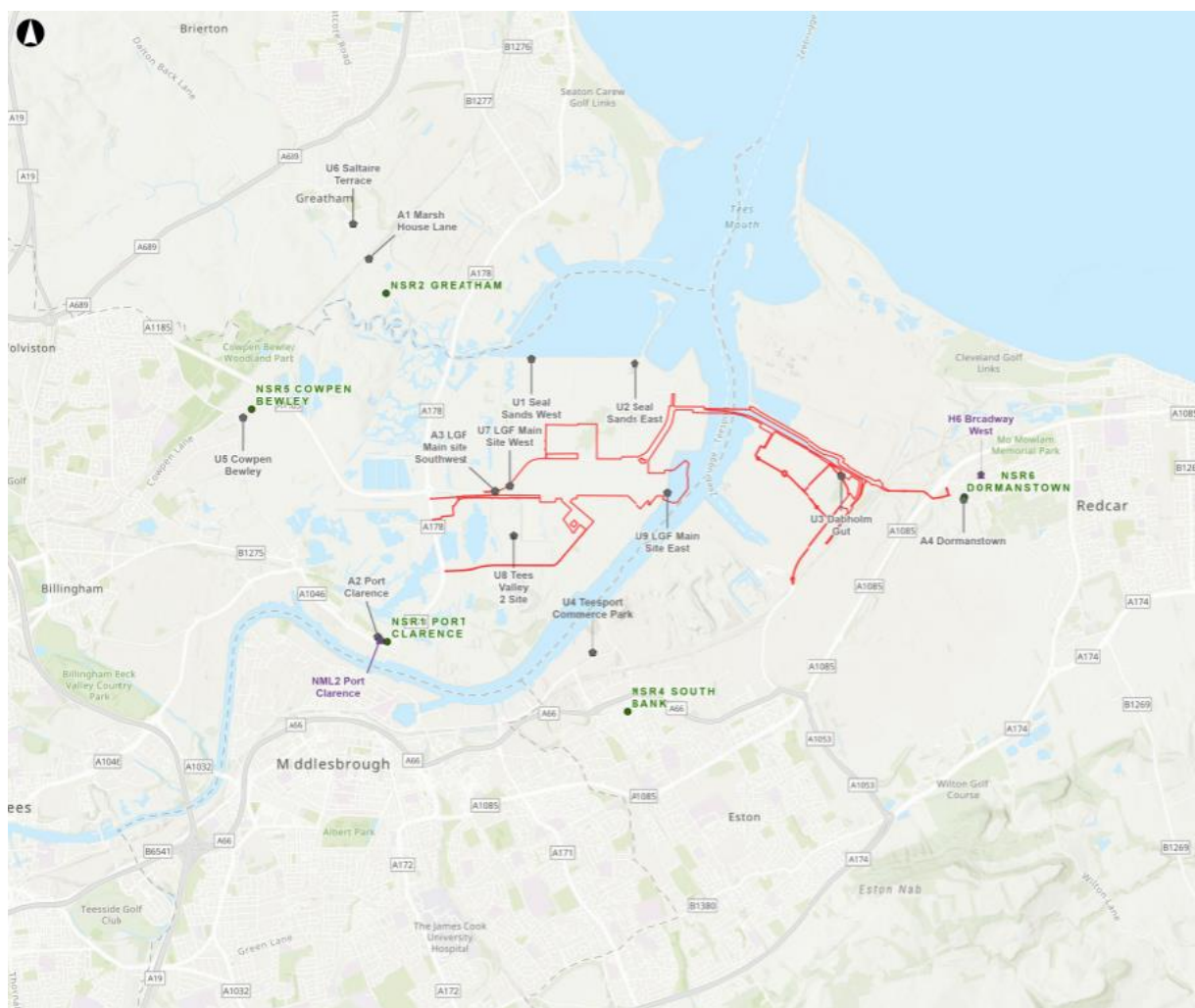
Abbreviation	In full
	representative of the maximum levels recorded during the sample period. A weighted statistical noise levels are denoted L_{A10}, dBL_{A90}. The reference time period (T) is normally included, e.g. $dBL_{A10, 5min}$ or $dBL_{A90, 8hr}$.

1 Introduction

- 1.1.1 Arup was commissioned by LGF Projects Ltd to undertake a baseline sound survey, as part of Lighthouse Green Fuels (hereafter referred to as the “Proposed Development”) Environmental Statement (ES). The survey consists of the following elements:
- Unattended environmental noise measurements at nine locations in and around the Proposed Development; and
 - Daytime attended environmental noise measurements at four locations around the Proposed Development.
- 1.1.2 The survey was carried out by Arup staff. Attended measurements were conducted on 26 March 2026. Unattended measurements were recorded continuously between 26 March 2026 to 8 April 2026, and 22 to 29 April 2026.
- 1.1.3 This appendix details the methodology and results of the 2026 Arup sound survey.
- 1.1.4 This appendix also includes baseline survey data from a previous survey collected by Lighthouse Green Fuels Ltd in 2024 (unpublished).

2 Site description

2.1.1 The Main Site of the Proposed Development is to be located in Seal Sands, off Seal Sands Road in Stockton-on-Tees Borough. The Proposed Development comprises the construction, operation (including maintenance where relevant) and decommissioning of a Sustainable Aviation Fuel (SAF) Production Facility in Teesside along with the pipeline infrastructure to allow the export of SAF product and the necessary utility connections. The Proposed Development Boundary, sound survey measurement locations and NSRs are shown in Inset 2.1.



Inset 2.1 Site map of proposed development boundary and survey locations

3 Measurement locations

3.1.1 Table 3.1 and Table 3.2 list the descriptions, grid references and addresses of measurement locations used in the 2026 Arup sound survey.

Table 3.1 Measurement location descriptions

Measurement location	Description	Area representing	Unattended noise monitoring	Attended noise measurements
A1	Marsh House Lane	Marsh House Farm, Greatham		✓
A2	Westlowthian Street, Port Clarence	Saltview Terrace, Port Clarence		✓
A3	LGF Main Site Southwest	RSPB Saltholme		✓
A4	Broadway West, Dormanstown	Dormanstown		✓
U1	Emergency Access Road, Seal Sands West	Teesmouth National Nature Reserve	✓	
U2	Emergency Access Road, Seal Sands East	Teesmouth National Nature Reserve	✓	
U3	Dabholm Gut	Dabholm Gut, Bran Sands Lagoon	✓	
U4	Teesport Commerce Park	South Bank	✓	
U5	Chapel Cottage, Cowpen Bewley	Cowpen Bewley	✓	
U6	34A Saltaire Terrace	Greatham	✓	
U7	LGF Main Site West	LGF Main Site, Teesmouth National Nature Reserve	✓	
U8	Tees Valley 2 Site, Huntsman Drive	RSPB Dorman's Pool Nature Reserve & Saltholme	✓	
U9	LGF Main Site East	LGF Main Site Quayside	✓	
NML2	RSPB/Teesside Environmental Trust land to north of Samphire Street	Saltview Terrace, Port Clarence	✓	

Table 3.2 Measurement location grid references and addresses

Measurement location	Grid reference	Address
A1	NZ 49858 26781	Marsh House Lane, Greatham, Hartlepool, Tees Valley, England, TS25 2HB, United Kingdom
A2	NZ 49967 21725	Westlowthian Street, Billingham, Stockton-on-Tees, Tees Valley, England, TS2 1SH, United Kingdom
A3	NZ 51559 23695	Billingham, Stockton-on-Tees, Tees Valley, England, TS2 1TP, United Kingdom
A4	NZ 57845 23518	Broadway West, Dormanstown, Redcar, Redcar and Cleveland, Tees Valley, England, TS10 5PJ, United Kingdom
U1	NZ 52038 25447	Emergency Access Rd, Stockton-on-Tees, Middlesbrough TS2 1FB
U2	NZ 53423 25388	Emergency Access Rd, Stockton-on-Tees, Middlesbrough TS2 1FB
U3	NZ 56211 23855	Dabholm Road, Redcar and Cleveland, Tees Valley, England, TS6 6UD, United Kingdom
U4	NZ 52852 21527	South Bank, Redcar and Cleveland, Tees Valley, England, TS6 6UZ, United Kingdom
U5	NZ 48162 24684	Cowpen Lane, Cowpen Bewley, Billingham, Stockton-on-Tees, Tees Valley, England, TS23 4HS, United Kingdom
U6	NZ 49645 27258	Saltaire Terrace, Greatham, Hartlepool, Tees Valley, England, TS25 2EZ, United Kingdom
U7	NZ 51748 23752	Seal Sands site, Billingham, Stockton-on-Tees, Tees Valley, England, TS2 1FB, United Kingdom
U8	NZ 51790 23084	Teesside Power Ltd, TV2 Site, Huntsman Drive, TS2 1UE, United Kingdom
U9	NZ 53844 23628	Vopak Storage, Tees Dock Road, Redcar and Cleveland, Tees Valley, England, TS6 6AF, United Kingdom
NML2	NZ 50000 21682	Samphire Street, Billingham, Stockton-on-Tees, Tees Valley, England, TS2 1SH, United Kingdom

4 Instrumentation

- 4.1.1 The sound level meters (SLMs), microphones and sound pressure level calibrators used by Arup are Class 1 instruments, conforming to BS EN 61672-1:2013 [Ref 3]. All instrumentation was within calibration and has fully traceable calibration to national and international standards, which are undertaken by an accredited calibration laboratory. Calibration certificates can be provided upon request.
- 4.1.2 The SLMs were checked for correct calibration before and after each series of measurements. No significant fluctuation in level was noted.
- 4.1.3 The instrumentation is as described in Table 4.1 and Table 4.2.

Table 4.1 Attended measurement instrumentation

Equipment	Description	Manufacturer	Model number	Serial number
RION NL-52 (ANV-01534)	SLM	RION	NL-52	00620964
	Calibrator	RION	NC-74	34625642

Table 4.2 Unattended measurement instrumentation

Measurement Location	Equipment	Description	Manufacturer	Model number	Serial number
All	RION NC-74	Calibrator	RION	NC-74	34625642
U1	RION NL-53 (ANV-01418)	SLM	RION	NL-52	00620964
U2	RION NL-53 (ANV-01960)	SLM	RION	NL-53	00741227
U3	RION NL-53 (ANV-01388)	SLM	RION	NL-53	00741228
U4	RION NL-53 (ANV-01882)	SLM	RION	NL-53	01130788
U5	RION NL-53 (ANV-01529)	SLM	RION	NL-53	00240895
U6	RION NL-52 (ANV-01534)	SLM	RION	NL-52	00620964
U7	RION NL-52 (ANV-01285)	SLM	RION	NL-52	01032445
U8	RION NL-52 (ANV-01694)	SLM	RION	NL-52	00620880
U9	RION NL-52 (ANV-01527)	SLM	RION	NL-52	00420711

5 Measurement methodology

- 5.1.1 At each measurement location, the L_{Aeq} , L_{A90} and L_{AFmax} metric parameters were measured and recorded. All broadband measurements were A-weighted and had a fast time weighting (with a time constant of 0.125s).
- 5.1.2 Three sets of 15-minute measurements were made at the attended locations (except where specified), and continuous measurements of 10 minutes were made at the unattended locations.
- 5.1.3 At each measurement location, the SLM was stored inside enhanced weather cases with the microphone set on a pole at 1.2-1.5m above local ground level. All measurements were taken under acoustically free-field conditions, except where otherwise stated. The appropriate windshield for the SLM was fitted to the microphone throughout to minimise wind-induced noise.

6 Measurement results

6.1 Attended measurements

- 6.1.1 The summary tables for each measurement location provided below are the arithmetic average of the individual measurements during the measured time period for typical L_{A90} , a logarithmic average for L_{Aeq} and a range for L_{AFmax} .

Location A1

- 6.1.2 **Location description:** Marsh House Lane, Greatham. Located next to roadblocks just past railway crossing.

Measurement period: Thursday 26/03/26 16:41 to Thursday 26/03/26 19:05

Weather conditions:

Wind speed: Less than 5m/s

Wind direction: Westerly

Summary: Dry, mild cloud cover and light breeze

Environment and observations: The dominant noise source was road traffic noise from vehicles travelling or parking along Marsh House Lane. There were occasional railway train passbys, along with rail crossing barrier alarm ringing.

Table 6.1 Summary of measurement results at A1

Period	Sound Pressure Level, dB(A) (re 20 uPa)		
	Typical $L_{A90,15min}$	Range of L_{AFmax}	Average $L_{Aeq,15min}$
Day	36	80-86	57



(Imagery ©2026, Map data ©2026 Google)

Inset 6.1 **Location A1 map**

Table 6.2 **Measurement results at A1**

Time		Sound Pressure Level, dB(A) (re 20 µPA)		
Start [hh:mm]	Start [hh:mm]	L _{A90,15min}	L _{AFmax}	L _{Aeq,15min}
16:41	16:56	36	80	55
18:25	18:40	41	86	60
18:50	19:05	34	84	59

Location A2

6.1.3 Location description: Corner of Eastlowthian Street and Westlowthian Street near residential properties. In front of barrier to an open field.

Measurement period: Thursday 26/03/26 15:38 to Thursday 26/03/26 18:05

Weather conditions:

Wind speed: Less than 5m/s

Wind direction: Westerly

Summary: Dry, mild cloud cover and light breeze

Environment and observations: The dominant noise source was road traffic noise on Port Clarence Road to the south, with occasional aircraft flyover noise.

Table 6.3 Summary of measurement results at A2

Period	Sound Pressure Level, dB(A) (re 20 uPa)		
	Typical $L_{A90,15min}$	Range of L_{AFmax}	Average $L_{Aeq,15min}$
Day	47	61-78	53



(Imagery ©2026, Map data ©2026 Google)

Inset 6.2 Location A2 map

Table 6.4 Measurement results at A2

Time		Sound Pressure Level, dB(A) (re 20 uPA)		
Start [hh:mm]	Start [hh:mm]	$L_{A90,15min}$	L_{AFmax}	$L_{Aeq,15min}$
15:38	15:53	48	68	52
17:23	17:38	48	76	53
17:50	18:05	47	78	53

Location A3

6.1.4 Location description: Lay-by north of Dorman's Pool nature reserve.

Measurement period: Thursday 26/03/26 16:04 to Thursday 26/03/26 16:19

Weather conditions:

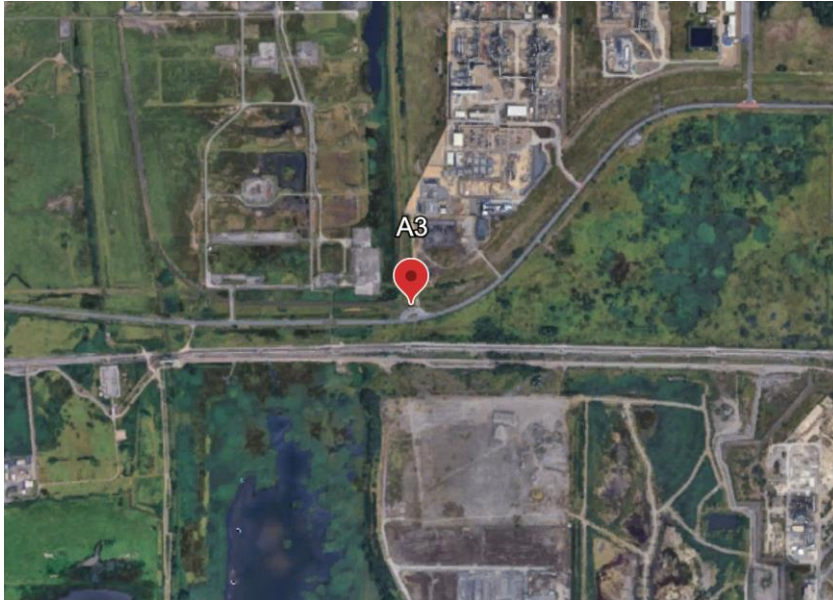
Wind speed: Less than 5m/s

Wind direction: Westerly

Summary: Dry, mild cloud cover and light breeze

6.1.5 Environment and observations: This measurement location was moved from its planned position to a lay-by just outside of the Main Site red line

boundary, as the original location was inside an ecologically sensitive area. The alternative measurement location proved to be dominated by road traffic noise from Seal Sands Road, unrepresentative of RSPB Dorman's Pool. Location U7 was also moved closer as a proxy to represent Dorman's RSPB Pool, therefore no further measurements were taken after the first 15-minute measurement at location A3, and location A3 was discarded.



(Imagery ©2026, Map data ©2026 Google)

Inset 6.3 **Location A3 map**

Location A4

6.1.6 Location description: Broadway West, Dormanstown, end of road with residential properties on either side.

Measurement period: Thursday 26/03/26 14:45 to Thursday 26/03/26 15:00

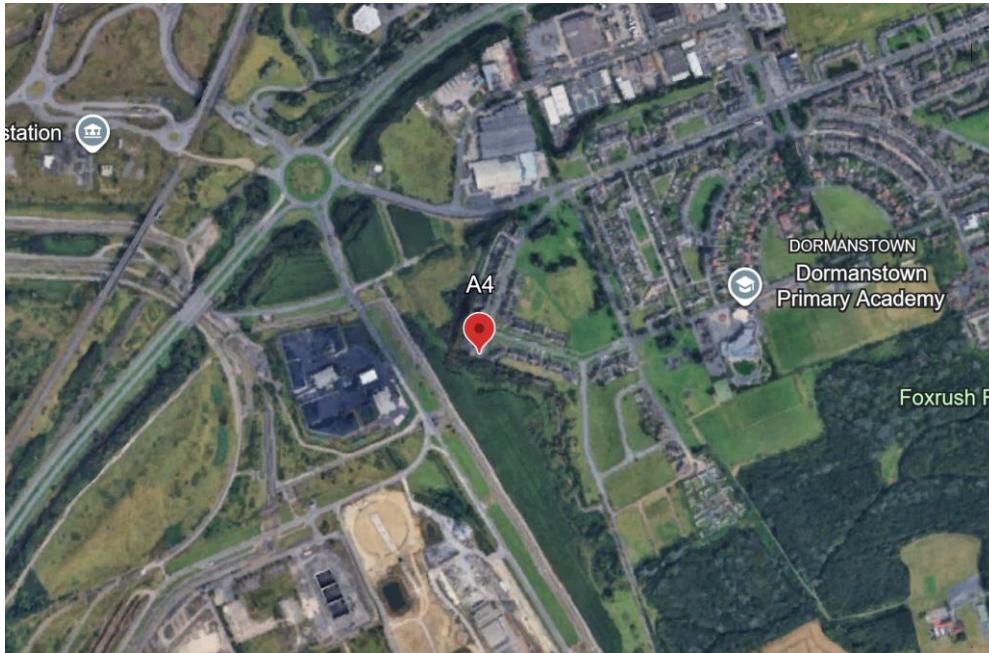
Weather conditions:

Wind speed: Less than 5m/s

Wind direction: Westerly

Summary: Dry, mild cloud cover and light breeze with occasional gusts

6.1.7 Environment and observations: Occupied residences to the west, unoccupied residence to the immediate east. The dominant noise source was industrial noise from southwest – a continuous hum with occasional banging. A single 15-minute measurement was made at this location due to safety concerns regarding of surveyors returning to make further measurements.



(Imagery ©2026, Map data ©2026 Google)

Inset 6.4 Location A4 map

Table 6.5 Measurement results at A4

Time		Sound Pressure Level, dB(A) (re 20 uPA)		
Start [hh:mm]	Start [hh:mm]	L _{A90,15min}	L _{Afmax}	L _{Aeq,15min}
14:45	15:00	54	75	56

6.2 Unattended measurements

Overview

6.2.1 Table 6.6 summarises the sound level metrics and time periods reported for each unattended measurement location.

Table 6.6 Results reported at each unattended measurement location and the purpose.

Sound level metric		Time periods	Purpose
L _{A90}	Typical	Day (07:00-23:00) Night (23:00 – 07:00)	Operational noise assessment for residential NSRs
L _{Amax}	Range	Day (07:00-23:00) Night (23:00 – 07:00)	Operational noise assessment for terrestrial ecological receptors
L _{Aeq}	Logarithmic average	Day (07:00-19:00) Evening (19:00 – 23:00) Night (23:00 – 07:00)	Operational noise assessment for terrestrial ecological receptors

- 6.2.2 The typical daytime and night-time background sound levels at each location were determined using statistical analysis of all the $LA_{90,10min}$ measurements, in line with BS 4142:2014 [Ref 1]. Histograms are plotted in the following sections to present the number of occurrences of each measured sound level, rounded to the nearest whole number.
- 6.2.3 Where no clear typical background sound level arose from statistical analysis, the measurement time history and professional judgement were used. Justification for the typical background sound levels at each measurement location are provided.
- 6.2.4 Measurements during periods of wind speeds greater than 5 m/s were omitted to ensure the determined background sound level was representative of typical meteorological conditions. Exceptions were made at the measurement locations along Seal Sands (U1 and U2), where wind noise is expected to contribute to the typical background sound levels.
- 6.2.5 Based on the size of the dataset (continuous measurements over the course of at least one week) and the robust statistical analysis methodology employed to determine typical background sound levels, the $LA_{90,10min}$ measurement data are considered appropriate to represent BS 4142 assessment periods $LA_{90,1hr}$ (daytime) and $LA_{90,15min}$ (night). This approach is supported by the ANC BS4142:2014+A1:2019 Technical Note [Ref 2], which states that:
- “BS 4142 is not prescriptive about the length of background sound measurement periods, only noting that the duration used should be adequate to represent the situation but not normally less than 15 minutes. This does not preclude measurements of less than 15 minutes, but where shorter measurements are taken, justification should be presented.
 - In this context, any measurement time interval is considered acceptable under the terms of BS 4142, providing the assessor can justify that it appropriately represents the background sound climate.”

Location U1

- 6.2.6 **Location description:** Seal Sands West on west side of Emergency Access Road

Measurement period: Wednesday 22/04/26 11:14 to Wednesday 29/04/26 11:02

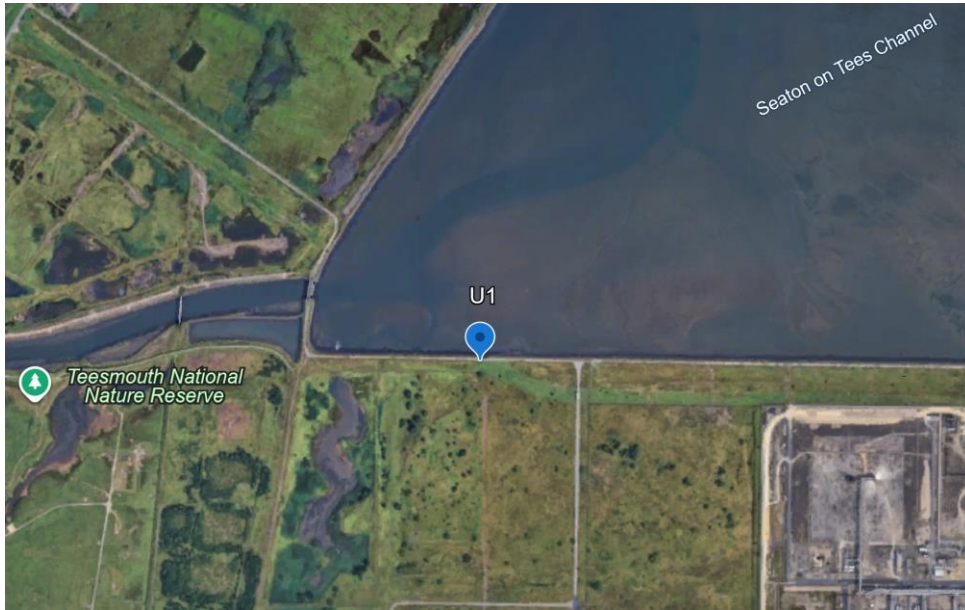
Weather conditions:

Wind speed: Less than 5m/s

Wind direction: North easterly

Summary: Dry, minimal to no cloud cover, consistent breeze

- 6.2.7 **Environment and observations:** Open, flat area south of Teesmouth Nature Reserve. Dominant noise sources included wind noise and a constant industrial hum from the east. Road traffic noise was expected from Seaton Carew Road to the west but was not audible at the time of installation due to wind noise and prevailing wind heading.



(Imagery ©2026, Map data ©2026 Google)

Inset 6.5 **Location U1 map**



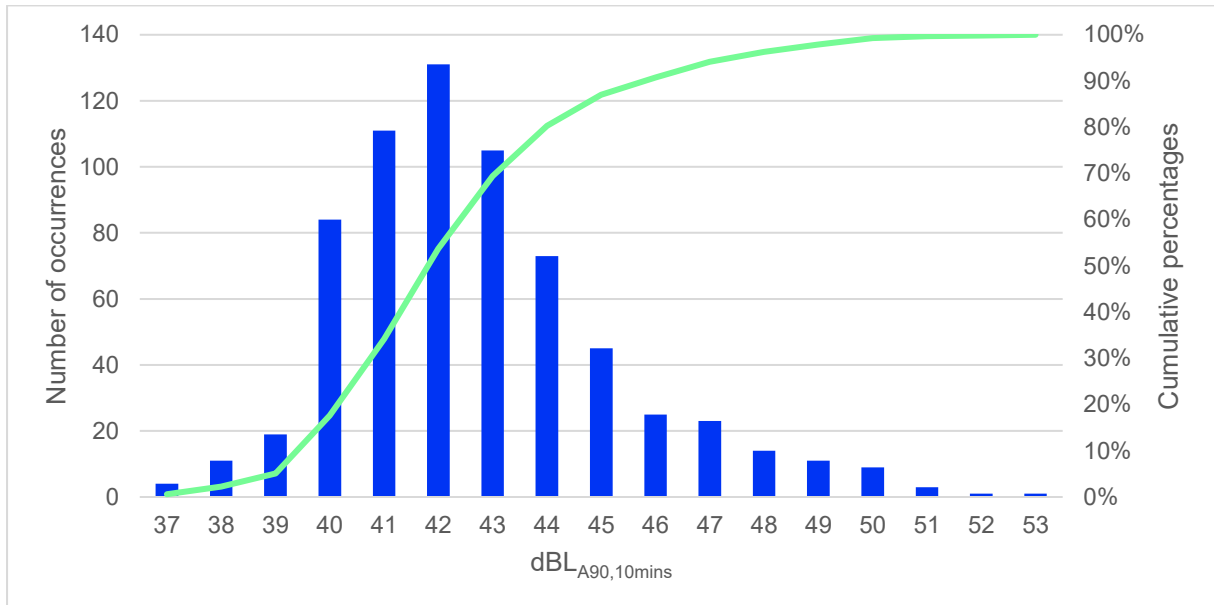
Inset 6.6 **Environmental sound measurement setup at location U1**

Table 6.7 **Summary of measurement results at U1**

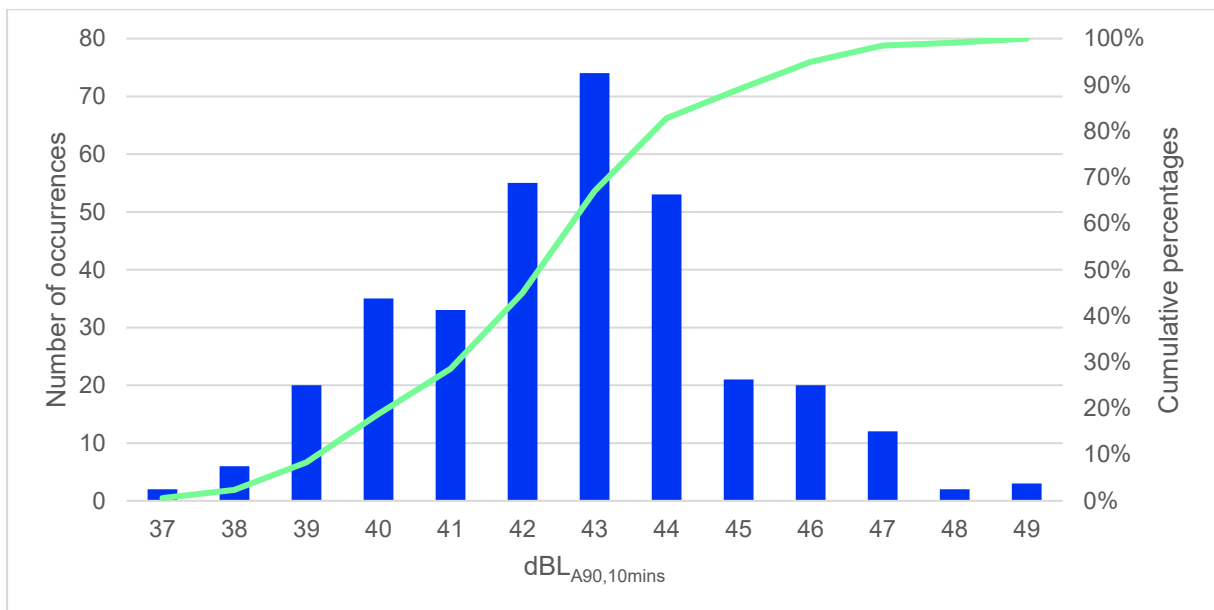
Location	Metric	Time period	Measured sound level, dB(A)
U1	Typical L_{AF90}	Day (07:00-23:00)	42
		Night (23:00-07:00)	43
	Range of L_{Amax}	Day (07:00-23:00)	44-76
		Night (23:00-07:00)	43-72
	Average L_{Aeq}	Day (07:00-19:00)	45
		Evening (19:00-23:00)	46
		Night (23:00-07:00)	45

6.2.8 Based on the statistical analysis of the $L_{A90,10min}$ measurements, the typical background sound level at U1 was determined to be $42dB_{LA90,1hr}$ during the daytime and $43dB_{LA90,15min}$ during the night-time. The similarity between the daytime and night-time background sound levels is likely driven by the continuous industrial noise in the vicinity.

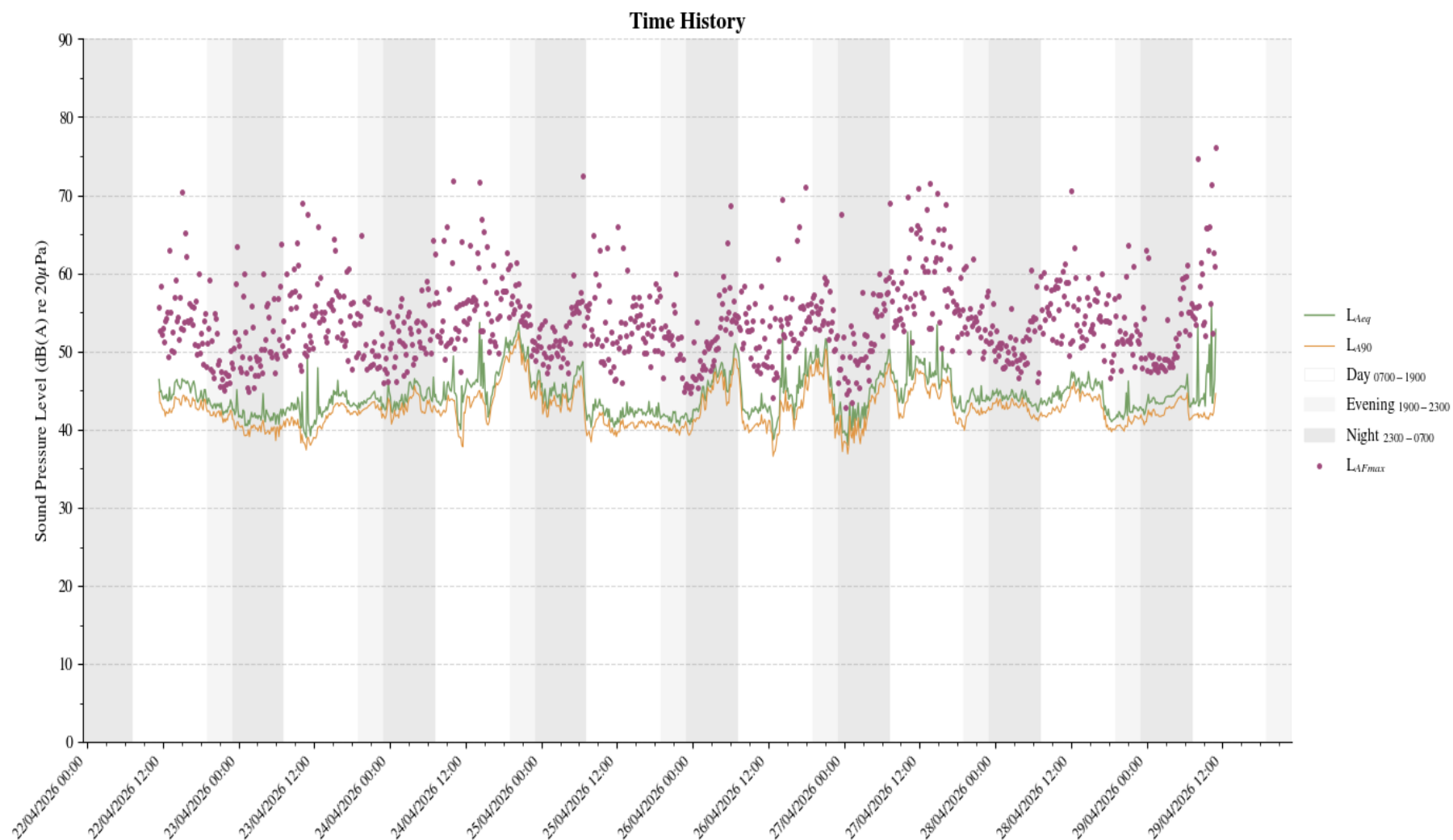
6.2.9 The time history graph supports this, as the L_{A90} appears to be relatively constant throughout the daytime and night-time on multiple days.



Inset 6.7 Histogram of the daytime $L_{A90,10min}$ measurements at U1



Inset 6.8 Histogram of the night-time $L_{A90,10min}$ measurements at U1



Inset 6.9

Graph plotting the time history of measurements at U1

Location U2

6.2.10 **Location description:** Seal Sands East on the east edge of emergency access road

Measurement period: Wednesday 22/04/26 11:46 to Wednesday 29/04/26 11:18

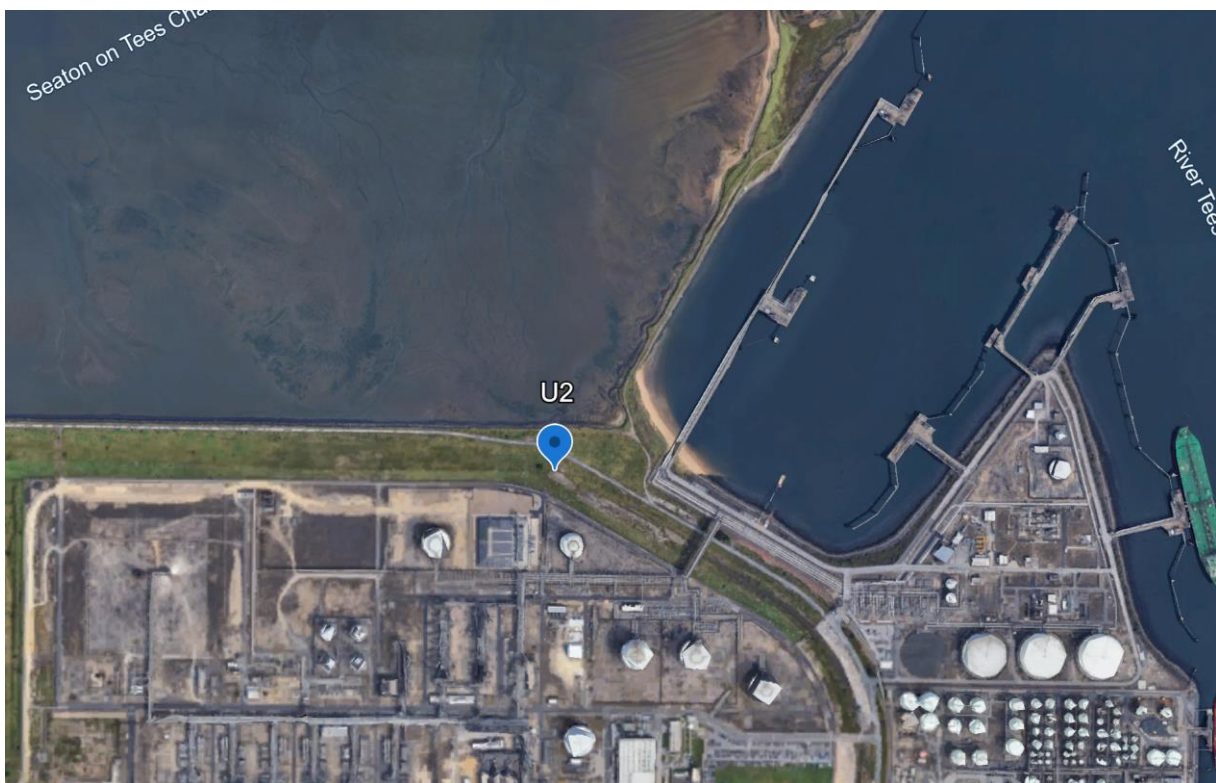
Weather conditions:

Wind speed: Less than 5m/s

Wind direction: North easterly

Summary: Dry, minimal to no cloud cover, strong consistent breeze

6.2.11 **Environment and observations:** Open, exposed area south of Teesmouth Nature Reserve. The dominant noise source was wind, followed by an industrial hum from the east. Constant industrial noise from the east, louder than at U1. Additional higher frequency hum heard from the Conoco Phillips site directly to the south. Bird noise (seagulls) occurring regularly.



(Imagery ©2026, Map data ©2026 Google)

Inset 6.10 Location U2 map



Inset 6.11 Environmental sound measurement setup at location U2

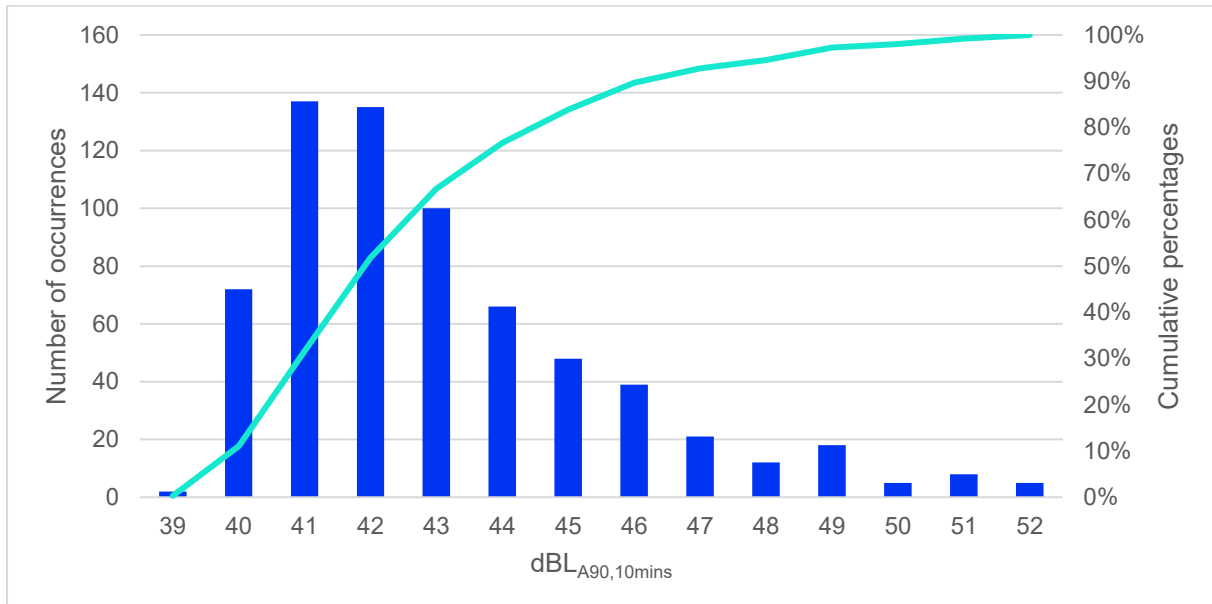
Table 6.8 Summary of measurement results at U2

Location	Metric	Time period	Measured sound level, dB(A)
U2	Typical LAF90	Day (07:00-23:00)	41
		Night (23:00-07:00)	45
	Range of LAmax	Day (07:00-23:00)	45-76
		Night (23:00-07:00)	46-75
	Average LAeq	Day (07:00-19:00)	45
		Evening (19:00-23:00)	48
		Night (23:00-07:00)	48

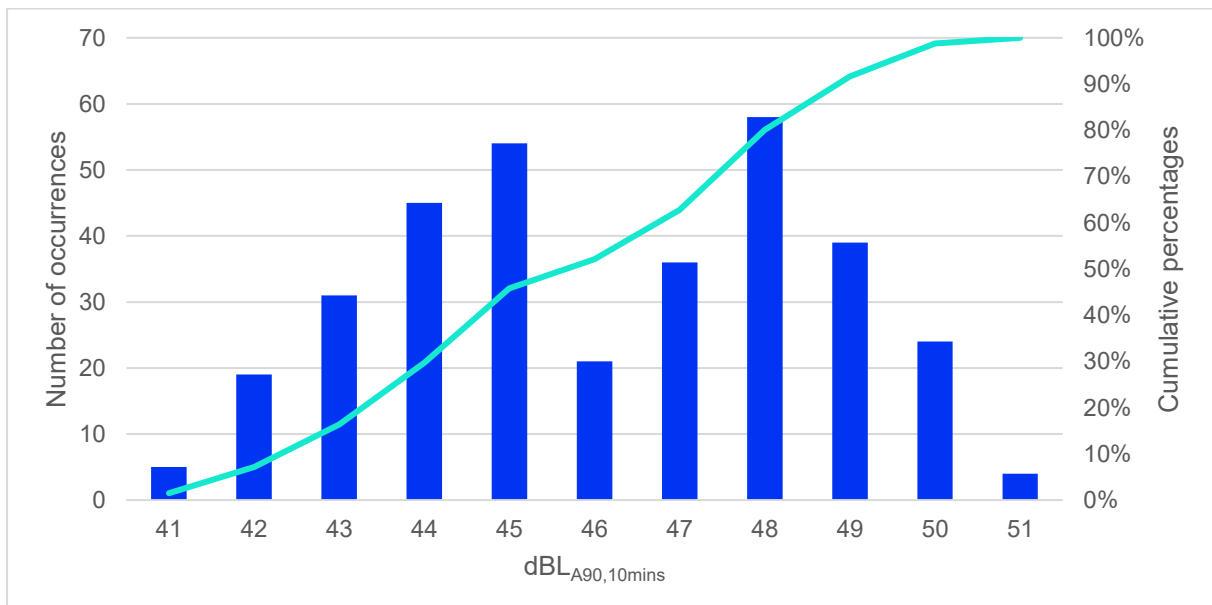
6.2.12 U2 had a similar baseline sound climate to U1. Based on the statistical analysis of the $L_{A90,10min}$ measurements, the typical background sound level at U2 was determined to be $41dB_{LA90,1hr}$ during the daytime and $45dB_{LA90,15min}$ during the night-time. The higher night-time background sound level is likely driven by the continuous industrial noise from the east and south.

6.2.13 During the night, there are two peaks in number of occurrences of measured $L_{A90,10min}$ at 45dB and 48dB. The lower of these have been taken as the typical night-time background sound level on a reasonable, precautionary basis.

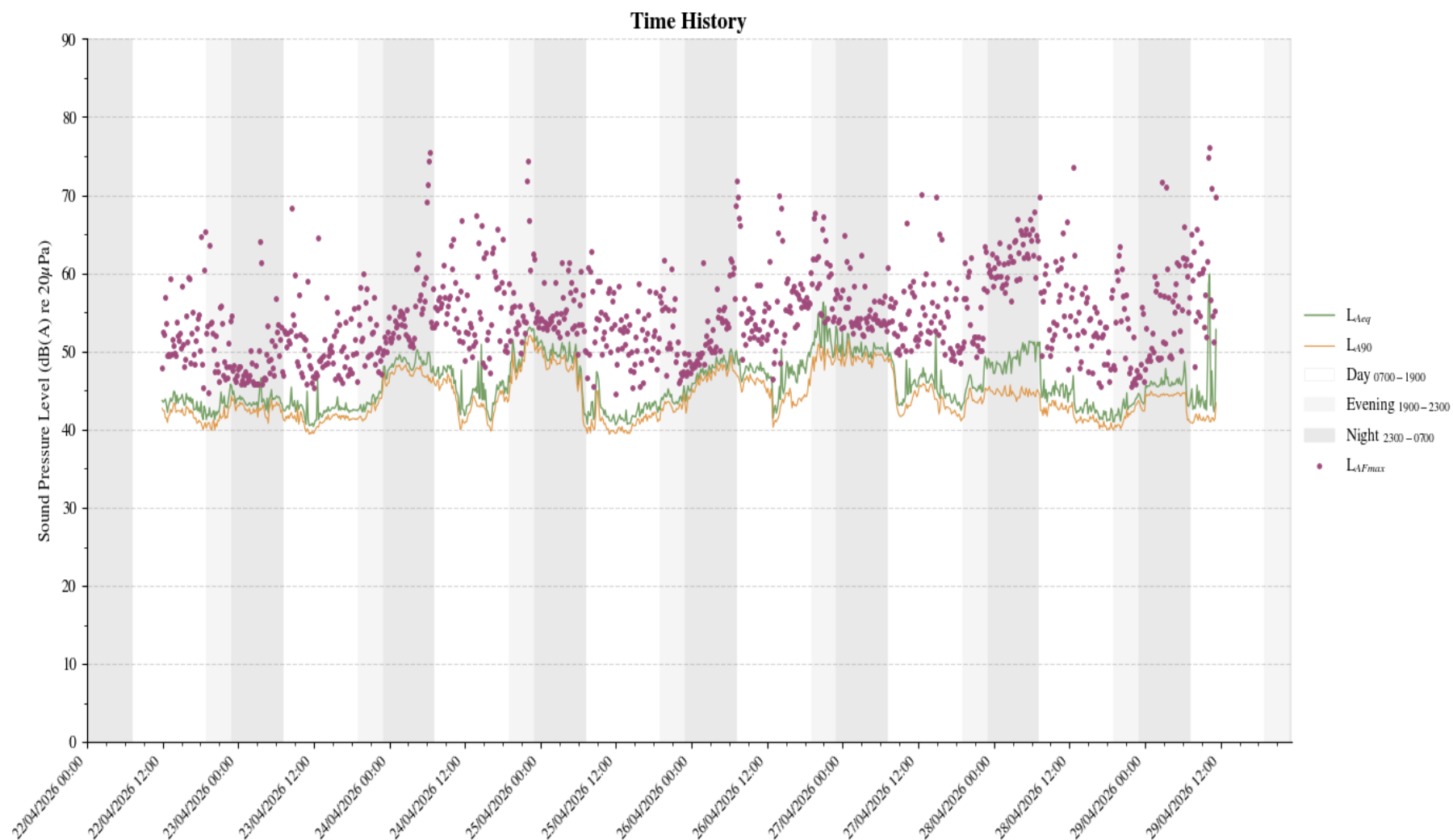
6.2.14 The time history graph supports this, as the L_{A90} appears to be relatively constant throughout the daytime and night-time on multiple days, with increased noise levels during the night-time on 24 to 27 April in particular.



Inset 6.12 Histogram of the daytime $L_{A90,10min}$ measurements at U2



Inset 6.13 Histogram of the night-time $L_{A90,10min}$ measurements at U2



Inset 6.14 Graph plotting the time history of measurements at U2

Location U3

6.2.15 **Location description:** Located along Dabholm Gut at the east end, on small access road

Measurement period: Wednesday 22/04/2026 13:33 to Wednesday 29/04/2026 12:44

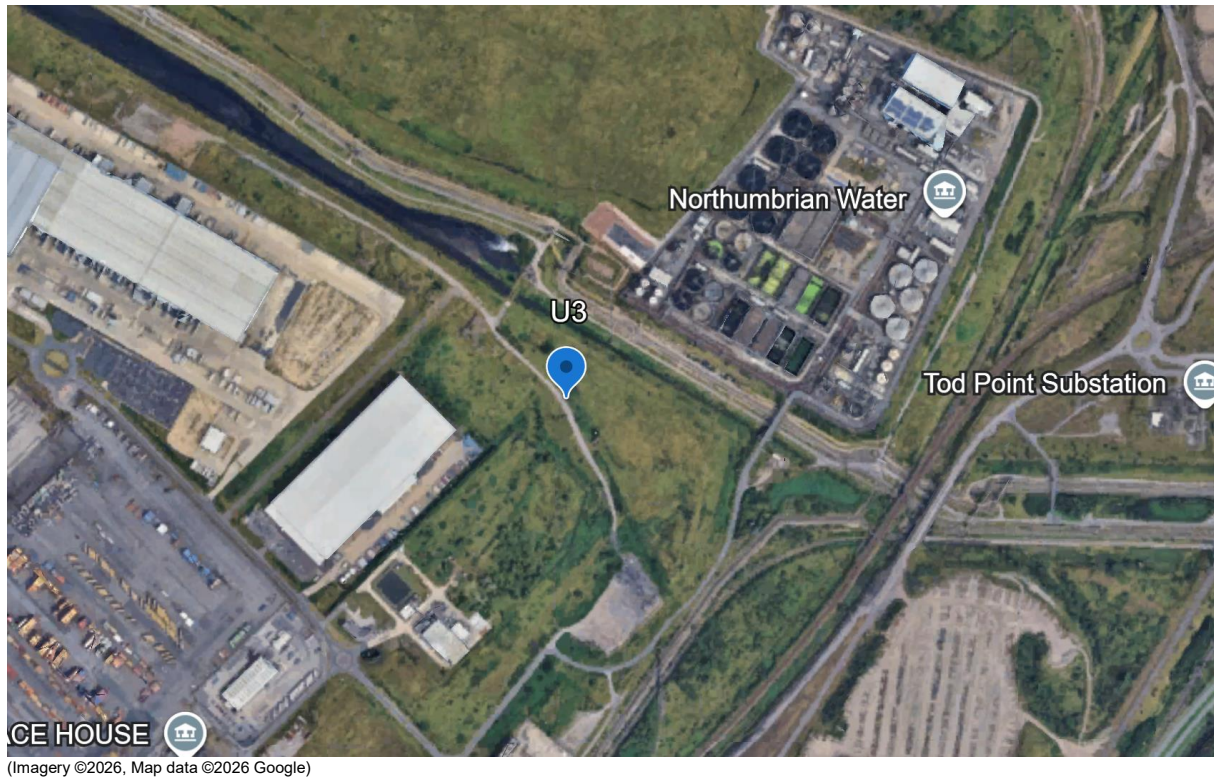
Weather conditions:

Wind speed: Less than 5m/s

Wind direction: North easterly

Summary: Dry, minimal to no cloud cover, semi-consistent breeze with occasional gusts

6.2.16 **Environment and observations:** This location was initially planned further east along Dabholm Gut, but due to unexpected excavation works, the measurement was relocated as shown in Table 6.15. Located behind supermarket import centre. Dominant noise sources were wind noise, a constant industrial noise hum coming from Northumbria Water directly to the north east, and some occasional industrial noise (clanging, beeping) audible in the distance from the east/south east. Occasional bird and wildlife noise was heard in the location. Occasional road traffic noise from truck movements to and from the import centre to the south.



Inset 6.15 **Location U3 map**

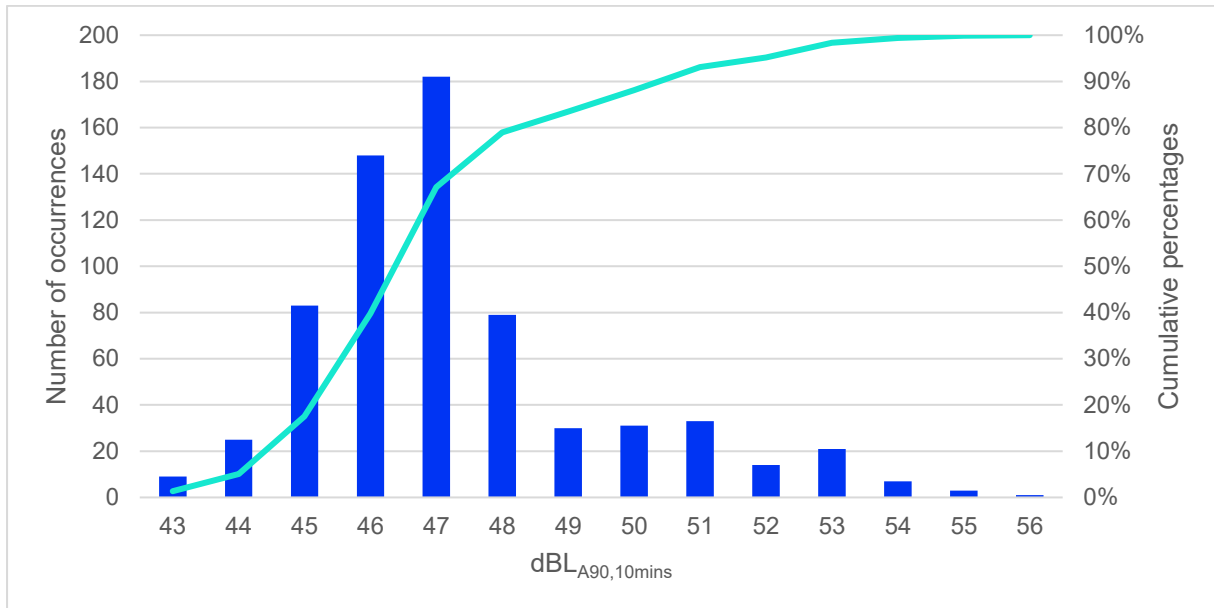


Inset 6.16 **Environmental sound measurement setup at Location U3**

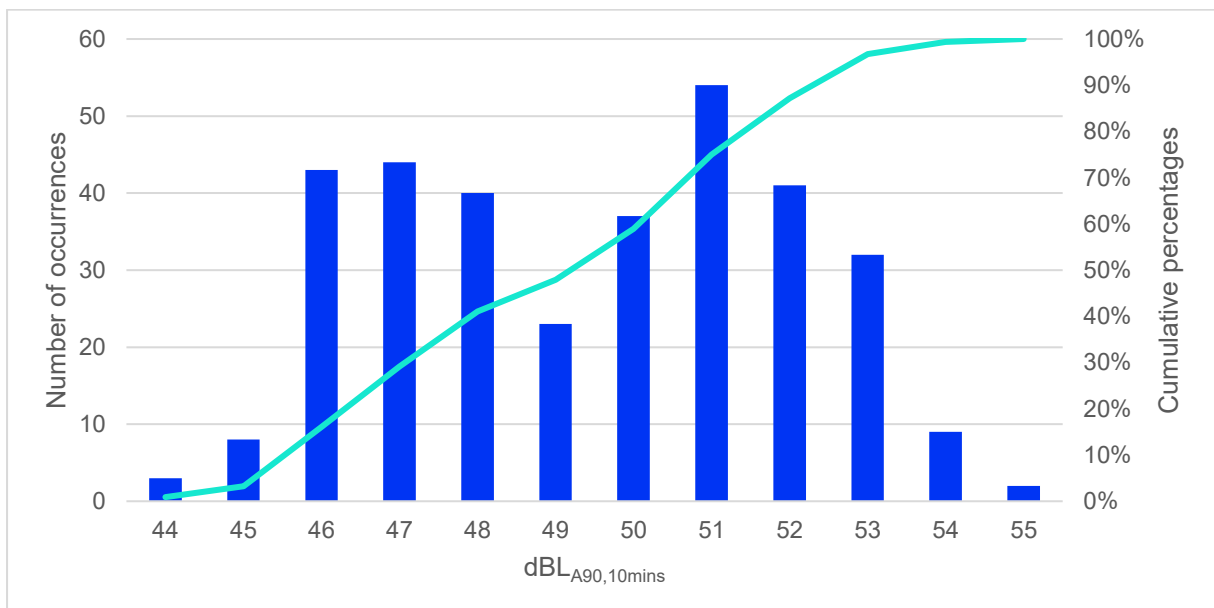
Table 6.9 Summary of measurement results at U3

Location	Metric	Time period	Measured sound level, dB(A)
U3	Typical L_{AF90}	Day (07:00-23:00)	47
		Night (23:00-07:00)	47
	Range of L_{Amax}	Day (07:00-23:00)	51-83
		Night (23:00-07:00)	51-79
	Average L_{Aeq}	Day (07:00-19:00)	50
		Evening (19:00-23:00)	52
		Night (23:00-07:00)	52

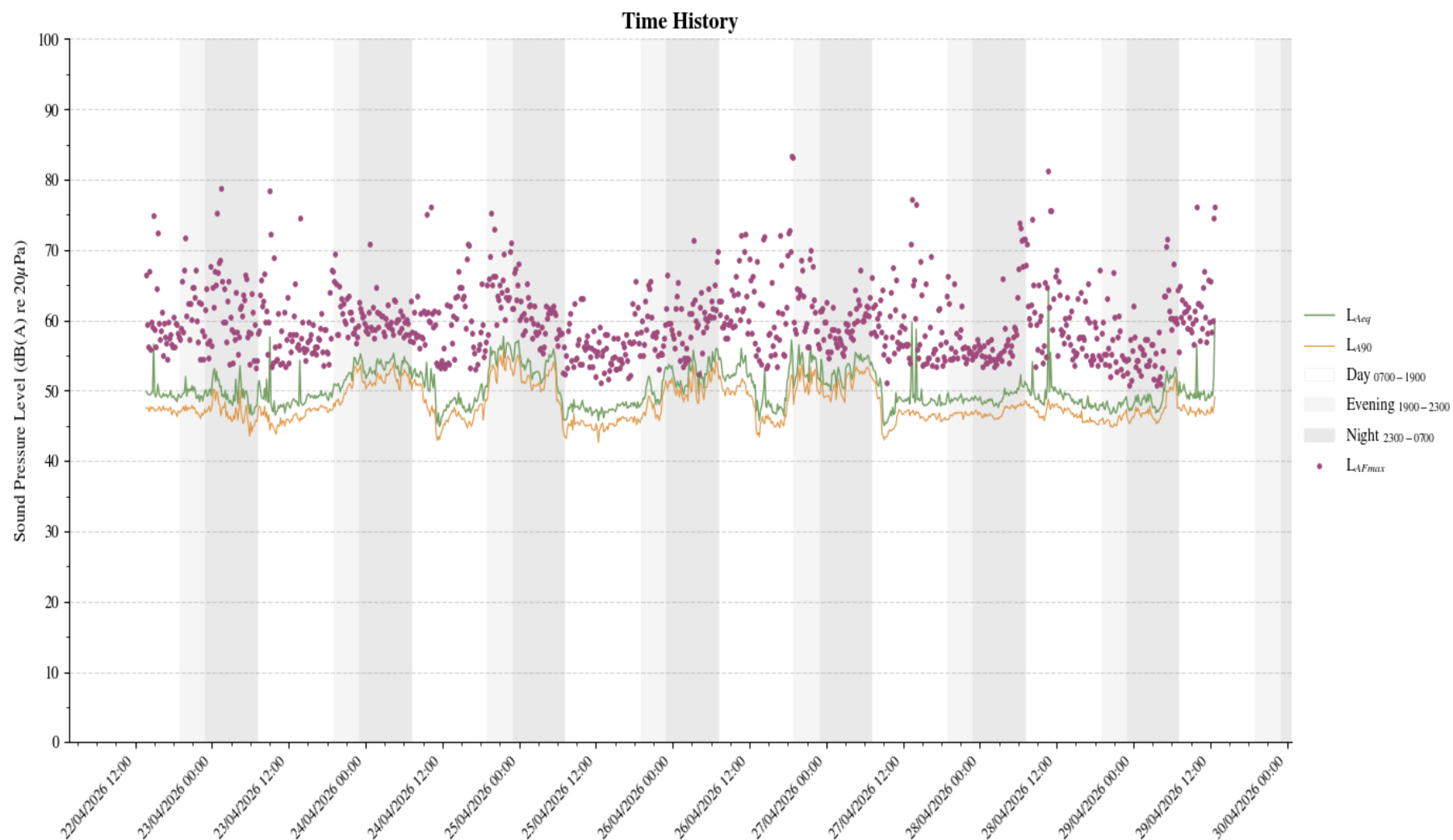
- 6.2.17 Based on the statistical analysis of the $L_{A90,10min}$ measurements, the typical background sound level at U3 was determined to be 47dB $L_{A90,1hr}$ during the daytime and 47dB $L_{A90,15min}$ during the night-time. The background sound level is likely driven by the continuous industrial noise from nearby industrial sites (e.g. Northumbrian Water to the north east and the distribution centre to the west).
- 6.2.18 During the night, there are two peaks in number of occurrences of measured $L_{A90,10min}$ at 47dB and 51dB. The lower of these have been taken as the typical night-time background sound level on a reasonable, precautionary basis.
- 6.2.19 The time history graph supports this, as the L_{A90} appears to be relatively constant throughout the daytime and night-time on multiple days, with increased noise levels during the night-time on 24 April to 27 April in particular.



Inset 6.17 Histogram of the daytime $L_{A90,10min}$ measurements at U3



Inset 6.18 Histogram of the night-time $L_{A90,10min}$ measurements at U3



Inset 6.19 Graph plotting the time history of measurements at U3

Location U4

6.2.20 **Location description:** Teesport Commerce Park

6.2.21 **Measurement period:** Wednesday 22/04/2026 12:45 to Wednesday 29/04/2026 12:25

Weather conditions:

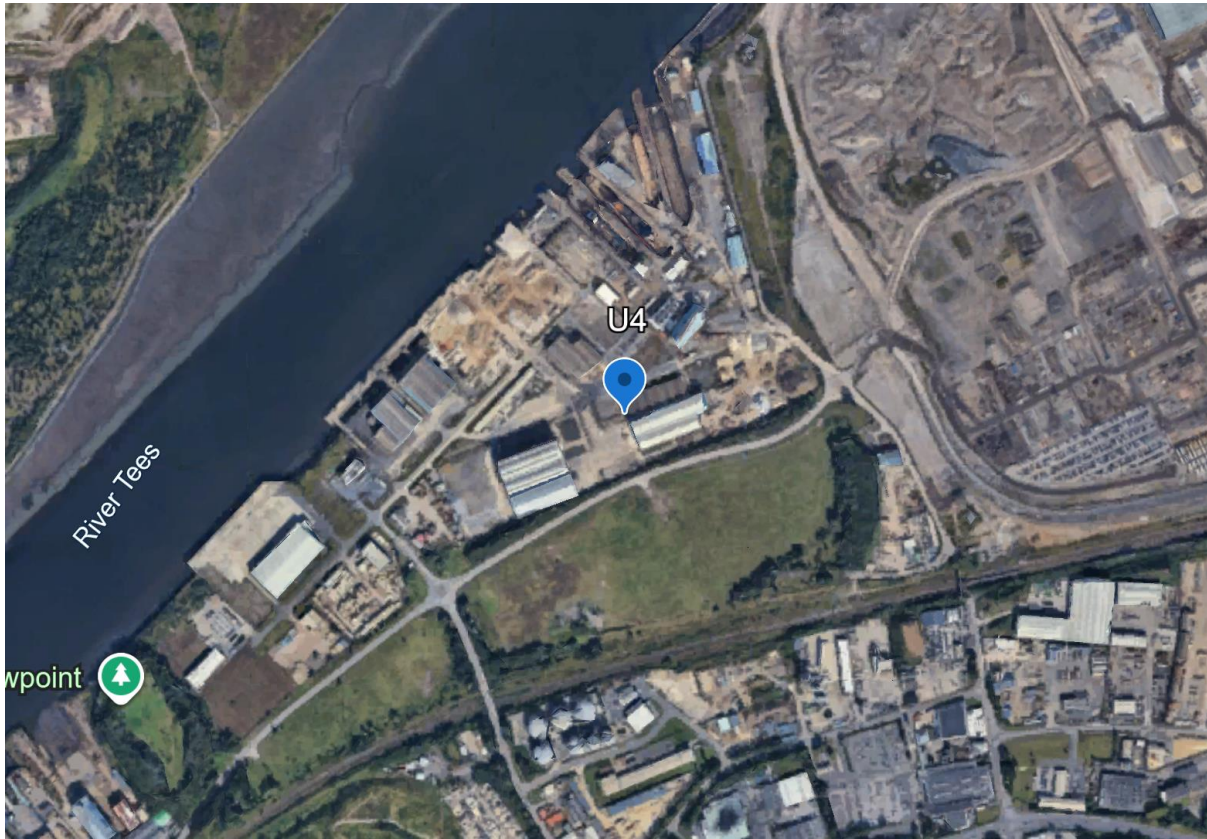
Wind speed: Less than 5m/s

Wind direction: North easterly

Summary: Dry, minimal to no cloud cover, occasional gusts of wind

6.2.22 **Environment and observations:** Located next to a disused building inside Teesport Commerce Park. The measurement was moved from the location initially suggested by PD Ports due to close proximity to ongoing works, not representative of South Bank.

6.2.23 Occasional road noise from Dockside Road (roughly 90m south behind a large hedge). General industrial noise from the commerce park audible from the north and west (cranes beeping and moving at the drydocks, clanging, large equipment moving, general hum). Occasional bird noise from the hedgerow between Dockside Road and measurement location. Location seems to be less windy than other locations as less exposed due to surrounding buildings. Dominant noise source industrial works, followed by road noise.



(Imagery ©2026, Map data ©2026 Google)

Inset 6.20 **Location U4 map**

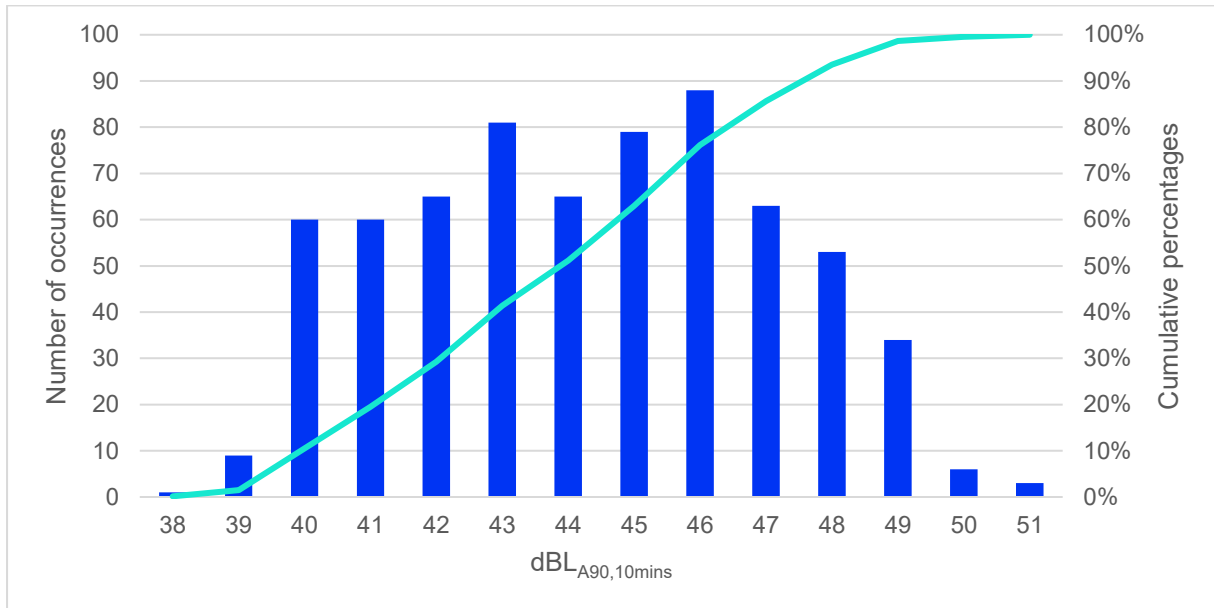


Inset 6.21 **Environmental sound measurement setup at location U4**

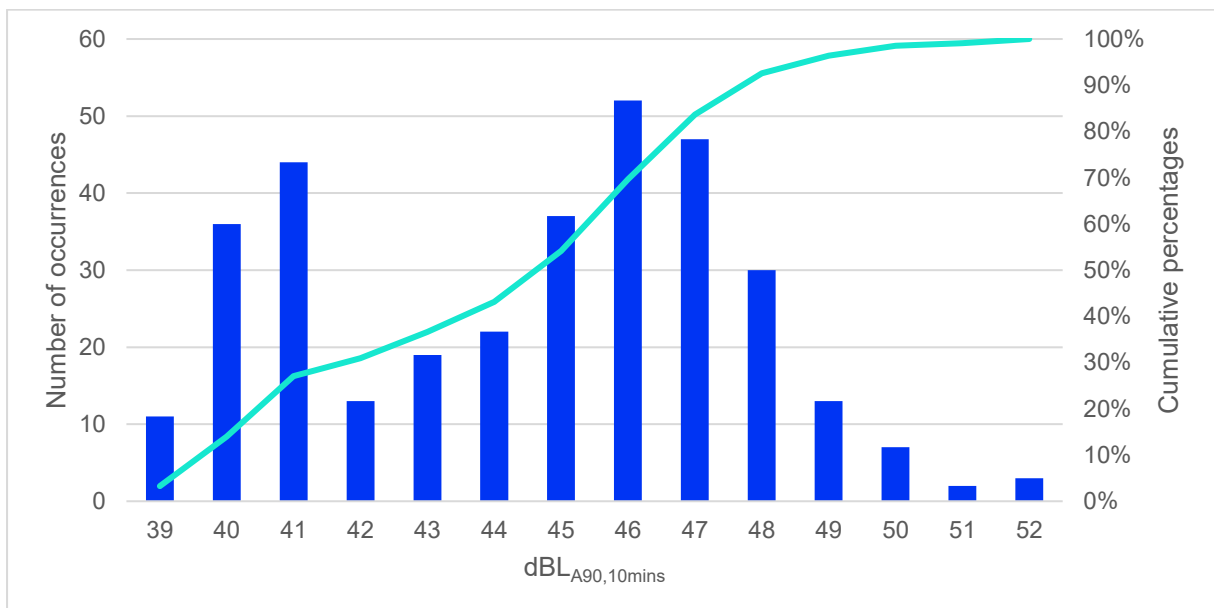
Table 6.10 Summary of measurement results at U4

Location	Metric	Time period	Measured sound level, dB(A)
U4	Typical L_{AF90}	Day (07:00-23:00)	43
		Night (23:00-07:00)	41
	Range of L_{Amax}	Day (07:00-23:00)	46-84
		Night (23:00-07:00)	45-80
	Average L_{Aeq}	Day (07:00-19:00)	51
		Evening (19:00-23:00)	46
		Night (23:00-07:00)	48

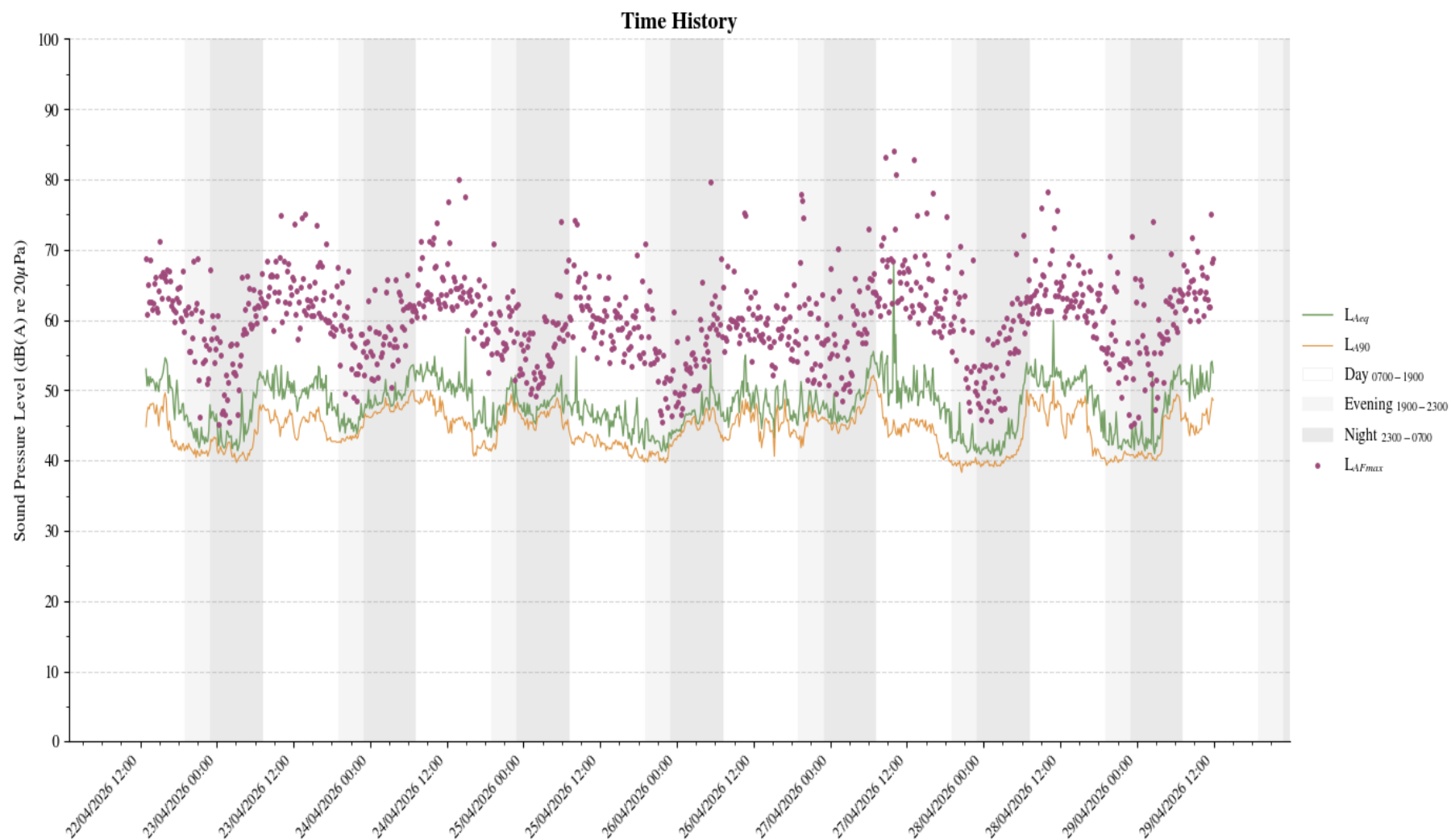
- 6.2.24 Based on the statistical analysis of the $L_{A90,10min}$ measurements, the typical background sound level at U4 was determined to be 43dB $L_{A90,1hr}$ during the daytime and 41dB $L_{A90,15min}$ during the night-time. The background sound level during daytime and night-time was likely driven by the continuous industrial noise from nearby industrial sites.
- 6.2.25 During the day, there are two peaks in the number of occurrences of measured $L_{A90,10min}$ at 43dB and 46dB. During the night, there are also two peaks in number of occurrences of measured $L_{A90,10min}$ at 41dB and 46dB. In both cases, the lower of these have been taken as the typical background sound levels on a reasonable, precautionary basis.
- 6.2.26 The time history graph supports this, as the measured background sound level appears to have consistent dips in daytime levels of 43dB $L_{A90,10min}$, and settles around 41dB $L_{A90,10min}$ during the night-time of 21, 28 and 29 April. The levels are likely driven by the industrial activity within the Commerce Park and the constant distant road traffic noise from the A66 to the south.



Inset 6.22 Histogram of the daytime $L_{A90,10min}$ measurements at U4



Inset 6.23 Histogram of the night-time $L_{A90,10min}$ measurements at U4



Inset 6.24 Graph plotting the time history of measurements at U4

Location U5

6.2.27 **Location description:** Residential garden of Chapel Cottage, Cowpen Bewley

Measurement period: Friday 27/03/2026 09:56 to Wednesday 08/04/2026 12:26

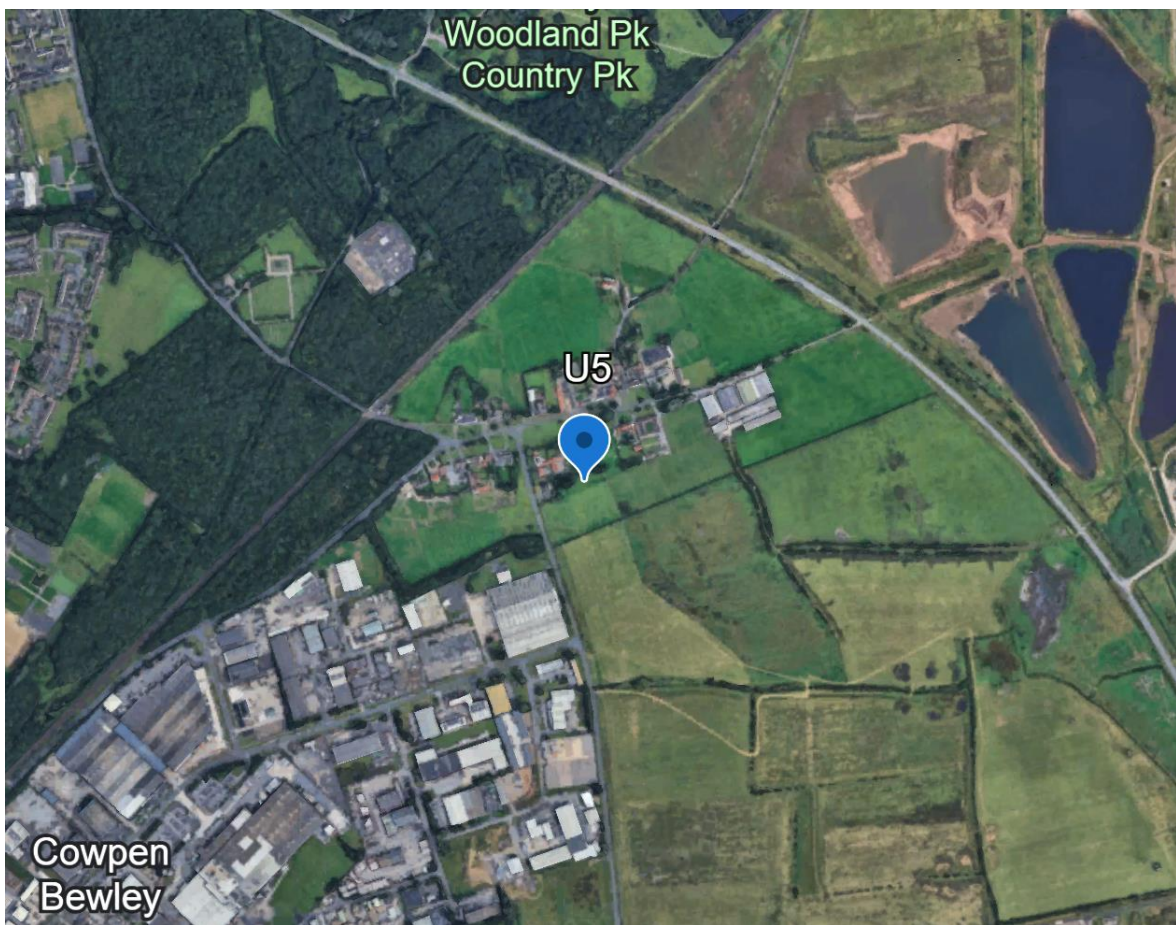
Weather conditions:

Wind speed: Less than 5m/s

Wind direction: Southerly

Summary: Dry, mild cloud cover

6.2.28 **Environment and observations:** The dominant noise sources were road traffic noise from Cowpen Bewley Road to the south west and constant industrial noise (with occasional clanging) to the south west. Regular wind and bird noise in nearby trees.



(Imagery ©2026, Map data ©2026 Google)

Inset 6.25 **Location U5 map**



Inset 6.26 Environmental sound measurement setup at location U5

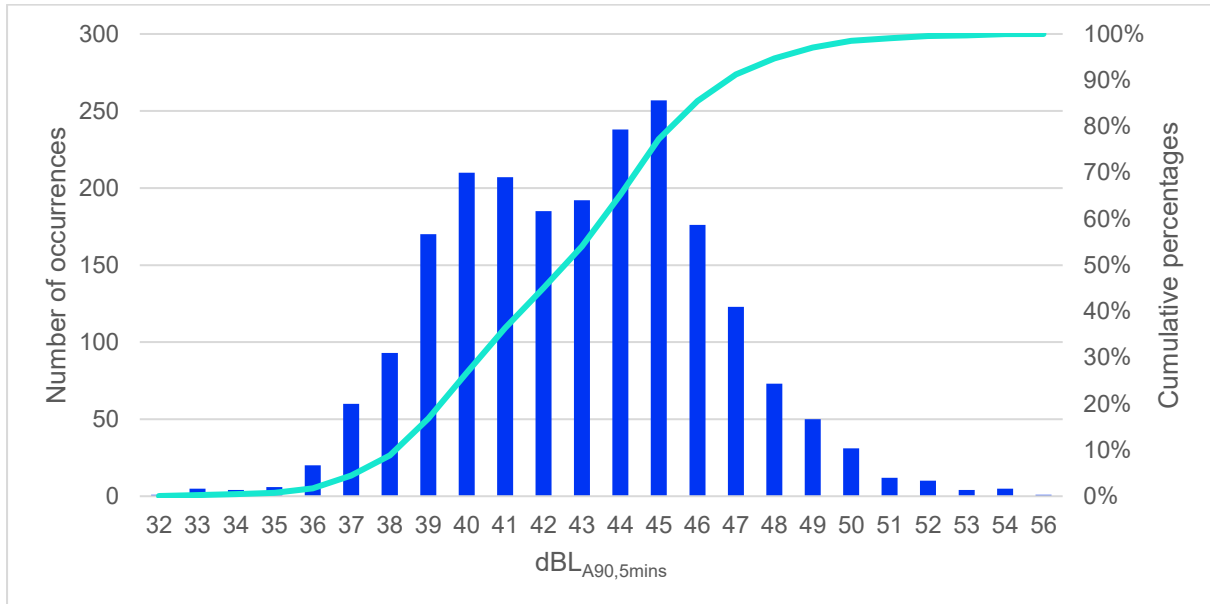
Table 6.11 Summary of measurement results at U5

Location	Metric	Time period	Measured sound level, dB(A)
U5	Typical L_{AF90}	Day (07:00-23:00)	45
		Night (23:00-07:00)	39
	Range of L_{Amax}	Day (07:00-23:00)	42-85
		Night (23:00-07:00)	38-80
	Average L_{Aeq}	Day (07:00-19:00)	51
		Evening (19:00-23:00)	49
		Night (23:00-07:00)	48

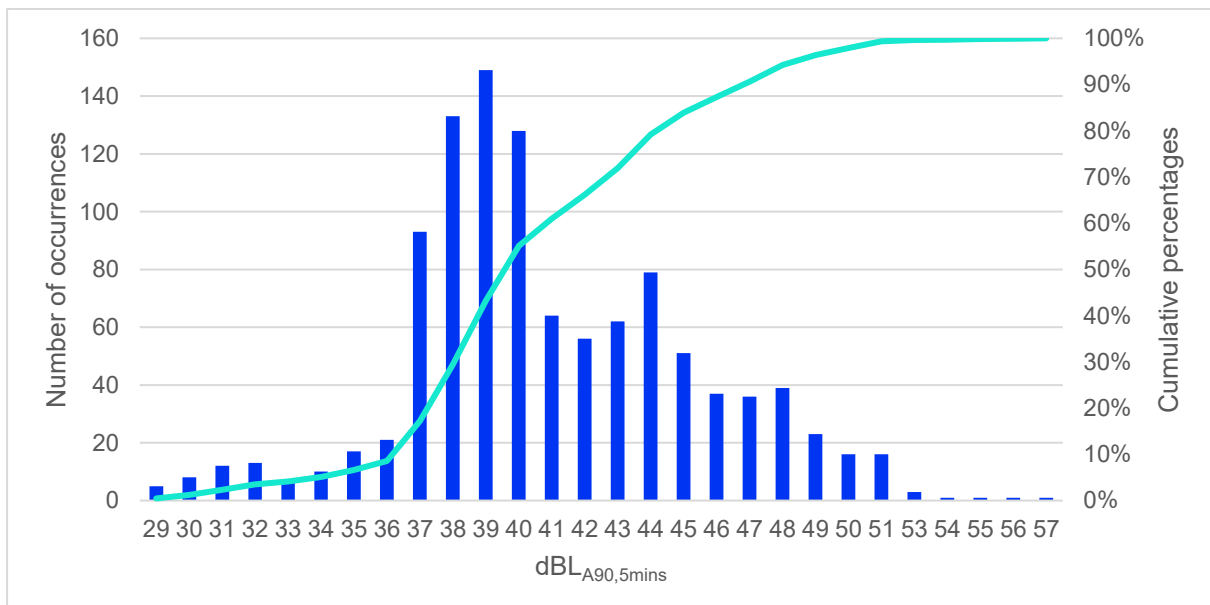
6.2.29 The measurement at U5 was carried out using 5-minute measurement periods. However, as statistical analysis was used to obtain the typical background sound levels, the same justification provided in 6.2.5 applies.

6.2.30 Based on the statistical analysis of the $L_{A90,5min}$ measurements, the typical background sound level at U5 was determined to be 45dB $L_{A90,1hr}$ during the daytime and 39dB $L_{A90,15min}$ during the night-time.

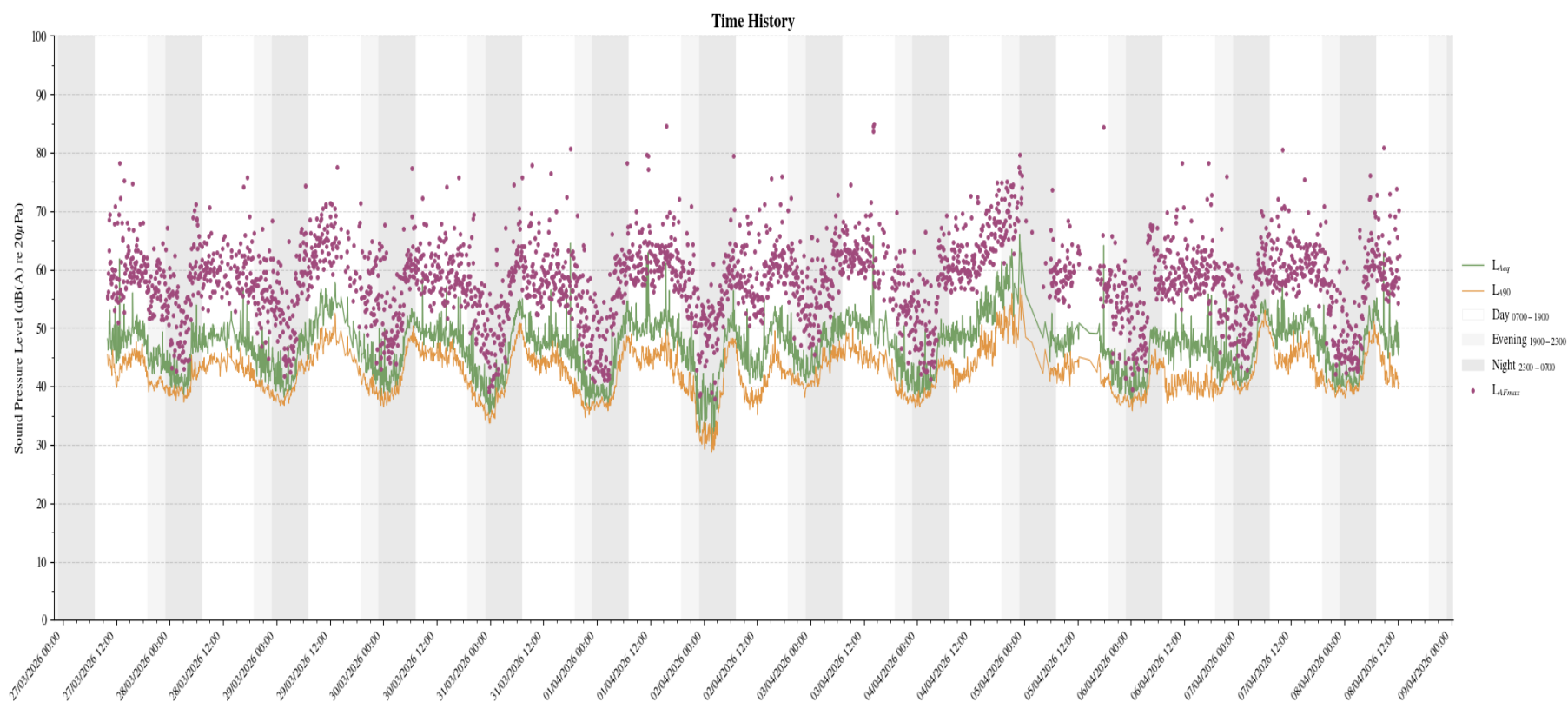
- 6.2.31 The time history graph supports this with a reoccurring pattern of daytime and nighttime measurements.
- 6.2.32 Note that a period of measurement has been excluded due to atypical weather circumstances (4 April 2026 to 5 April 2026).



Inset 6.27 Histogram of the daytime $L_{A90,5min}$ measurements at U5



Inset 6.28 Histogram of the night-time $L_{A90,5min}$ measurements at U5



Inset 6.29 Graph plotting the time history of measurements at U5

Location U6

6.2.33 **Location description:** Residential garden of Saltaire Terrace

Measurement period: Friday 27/03/2026 10:32 to Wednesday 08/04/2026 12:54

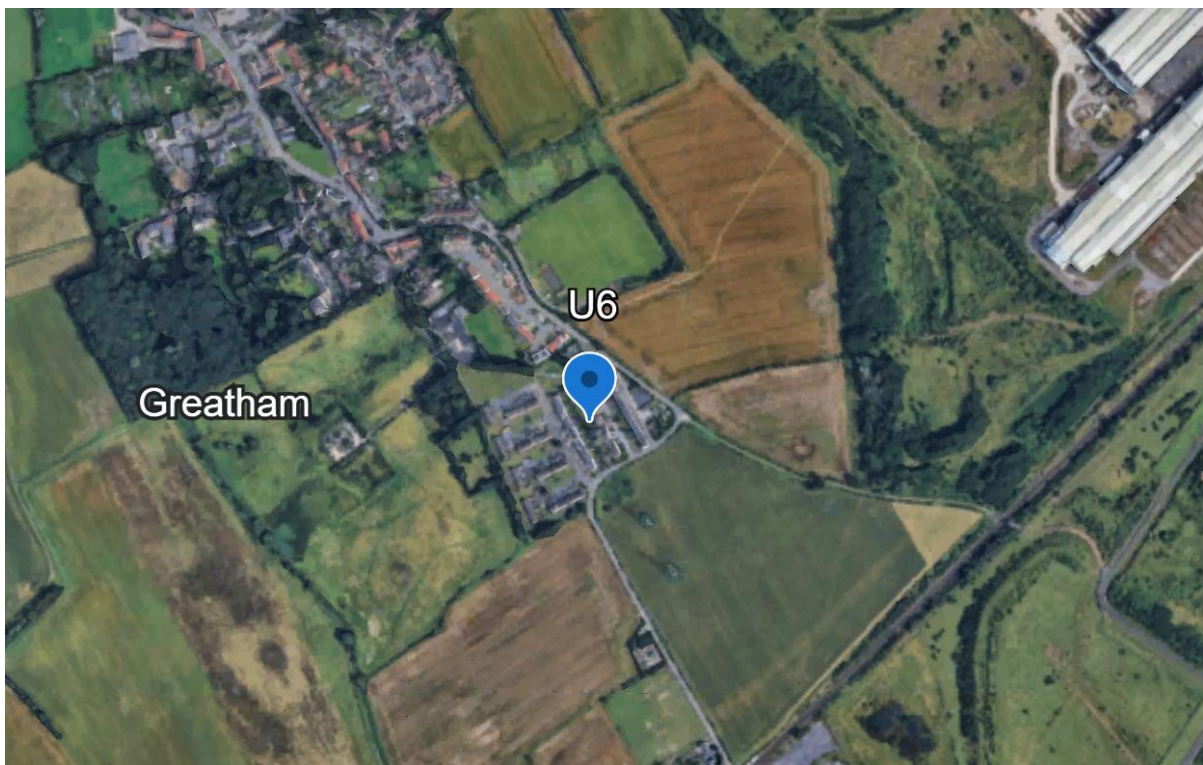
Weather conditions:

Wind speed: Less than 5m/s

Wind direction: Southerly

Summary: Dry, mild cloud cover

6.2.34 **Environment and observations:** The dominant noise source was birdsong in the nearby trees (with a bird feeder nearby). Occasional aircraft flyovers to the north and distant road traffic noise also contributed to the baseline conditions. During installation school children could be heard in the north (potentially during break time). The local church also had regular bell tolls.



(Imagery ©2026, Map data ©2026 Google)

Inset 6.30 **Location U6 map**

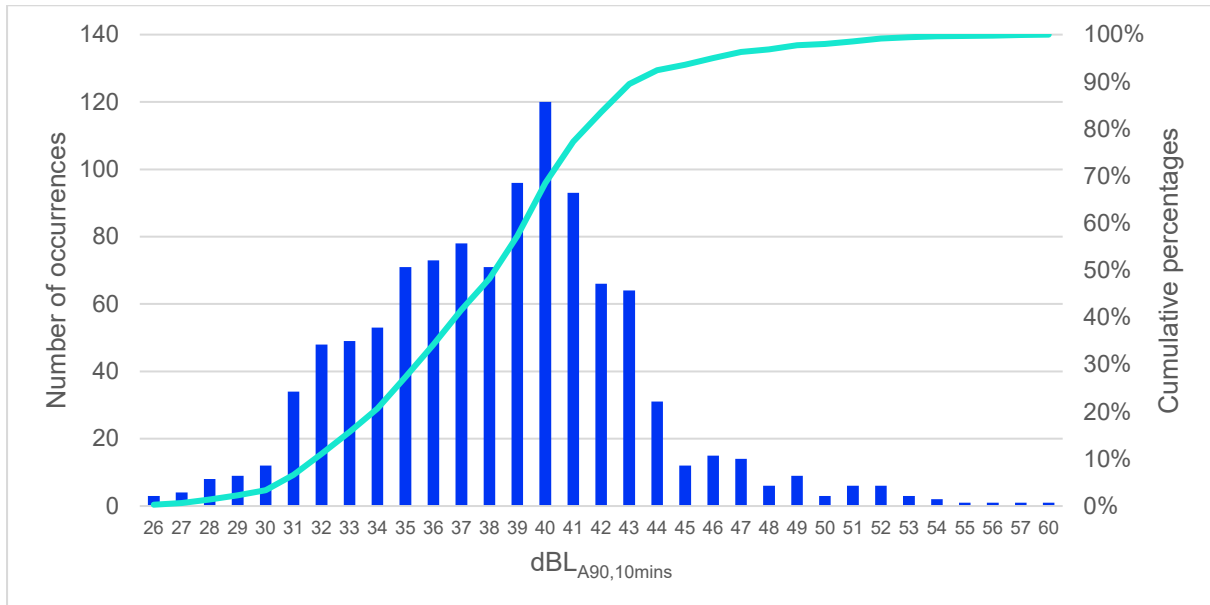


Inset 6.31 Environmental sound measurement setup at location U6

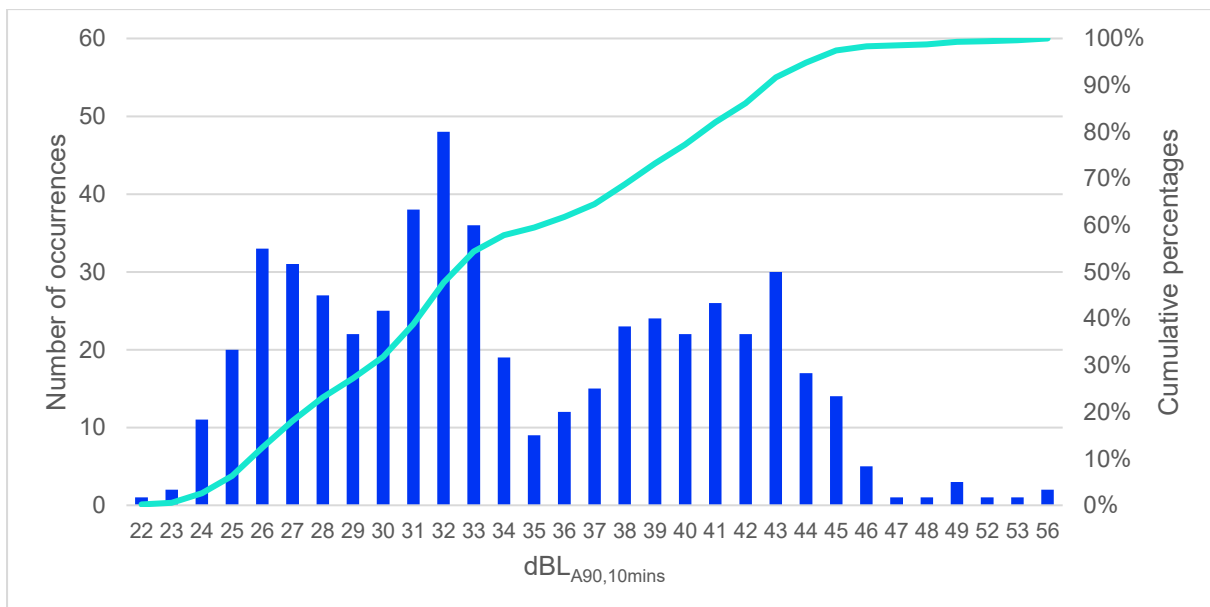
Table 6.12 Summary of measurement results at U6

Location	Metric	Time period	Measured sound level, dB(A)
U6	Typical L_{AF90}	Day (07:00-23:00)	40
		Night (23:00-07:00)	32
	Range of L_{Amax}	Day (07:00-23:00)	36-92
		Night (23:00-07:00)	33-88
	Average L_{Aeq}	Day (07:00-19:00)	55
		Evening (19:00-23:00)	48
		Night (23:00-07:00)	54

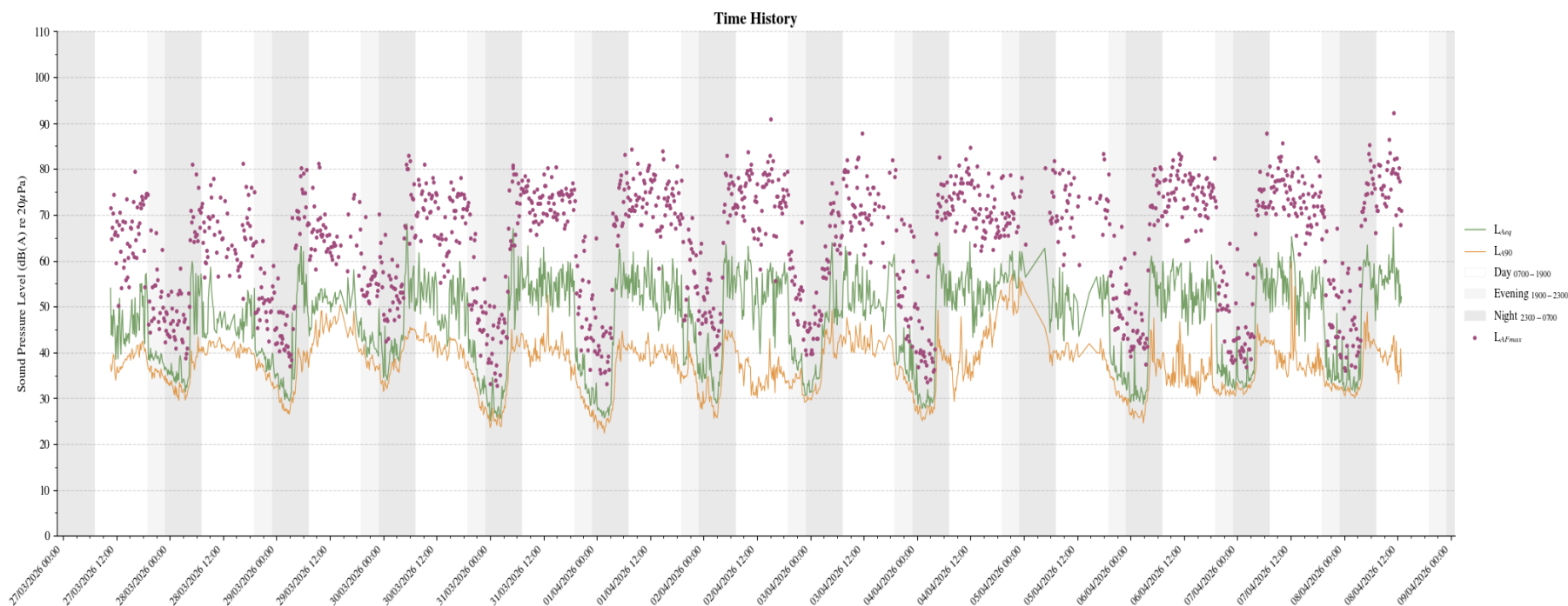
- 6.2.35 Based on the statistical analysis of the $L_{A90,10min}$ measurements, the typical background sound level at U6 was determined to be $40dBL_{A90,1hr}$ during the daytime and $32dBL_{A90,15min}$ during the night-time.
- 6.2.36 The time history graph supports this with a reoccurring pattern of daytime and nighttime measurements.



Inset 6.32 Histogram of the daytime $L_{A90,10min}$ measurements at U6



Inset 6.33 Histogram of the night-time $L_{A90,10min}$ measurements at U6



Inset 6.34 Graph plotting the time history of measurements at U6

Location U7

6.2.37 Location description: Main Site West

Measurement period: Thursday 26/03/2026 12:28 to Wednesday 08/04/2026 11:14

Weather conditions:

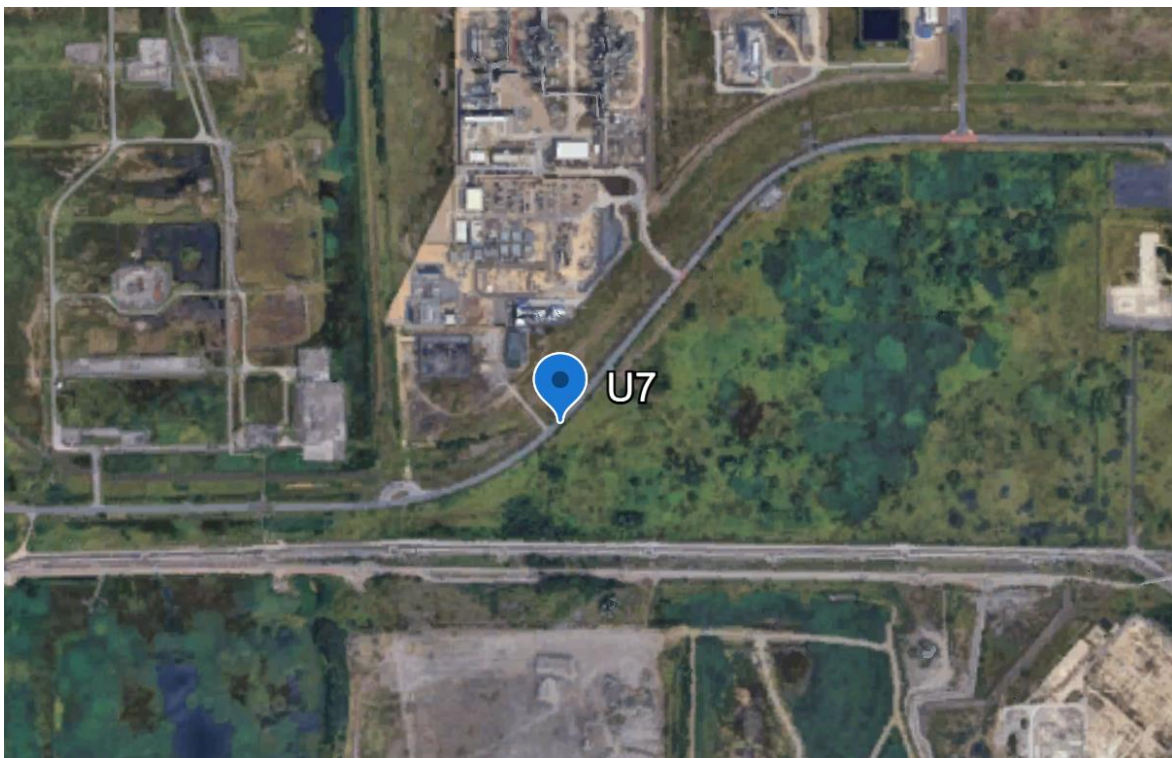
Wind speed: Less than 5m/s

Wind direction: Westerly

Summary: Dry, mild cloud cover

6.2.38 **Environment and observations:** This location was relocated due to access constraints near ecologically sensitive area, and to be closer to and representative of RSPB Dorman's Pool (especially in light of the discarding of Location A3).

6.2.39 The dominant noise sources were the constant industrial hum from the power station to the north and road traffic noise from car and lorry passbys on the adjacent Seal Sands Road.



(Imagery ©2026, Map data ©2026 Google)

Inset 6.35 Location U7 map

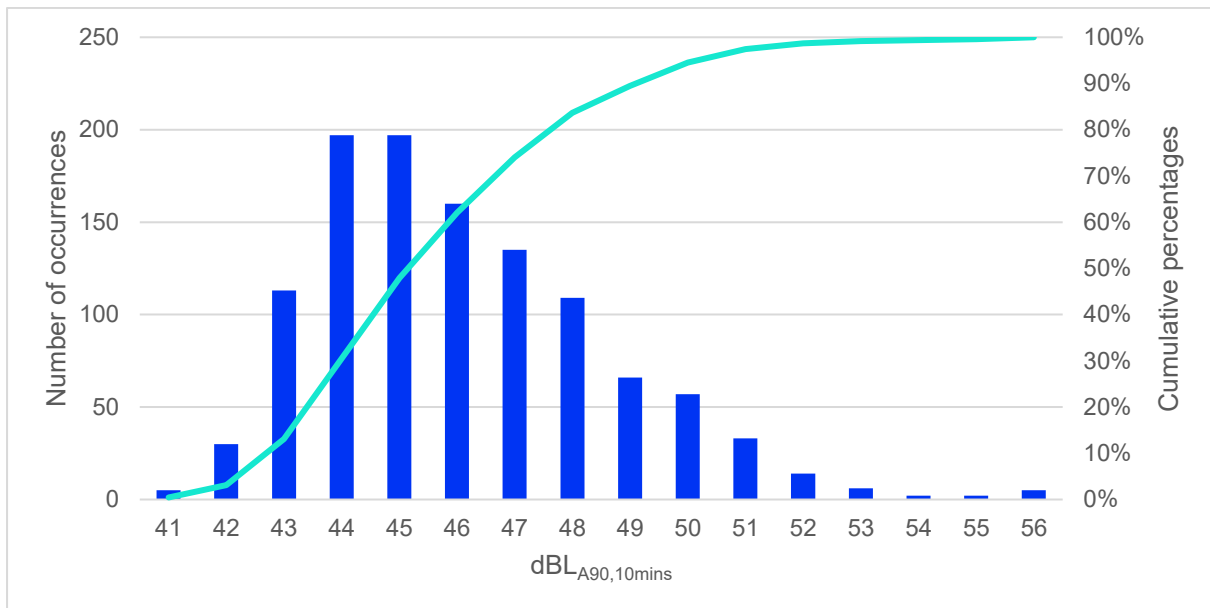


Inset 6.36 Environmental sound measurement setup at location U7

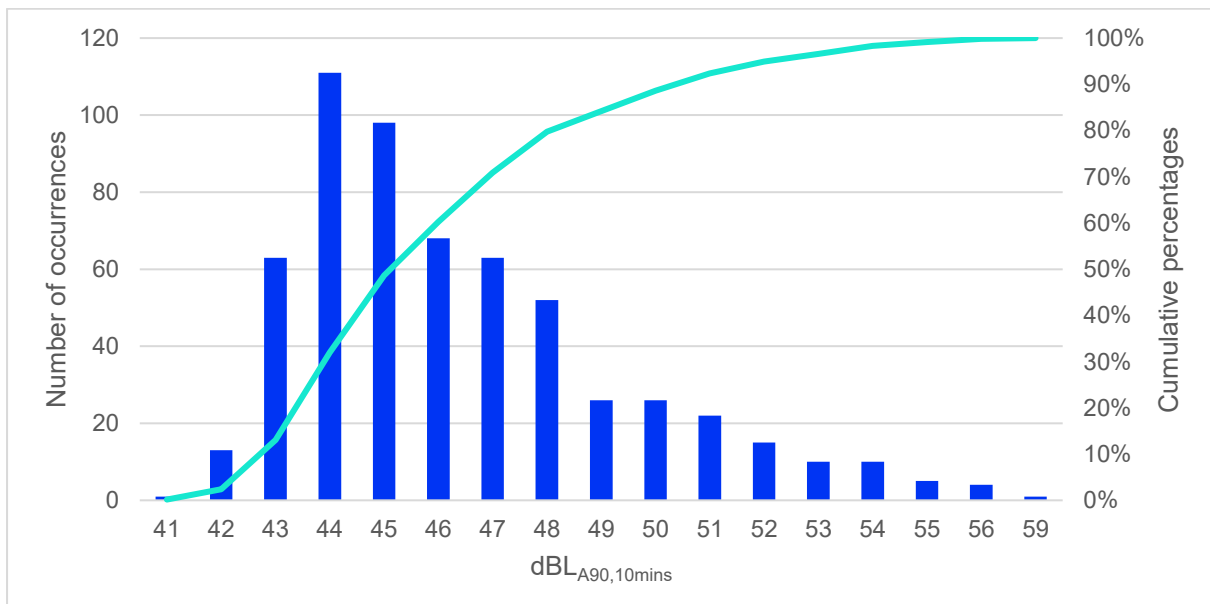
Table 6.13 Summary of measurement results at U7

Location	Metric	Time period	Measured sound level, dB(A)
U7	Typical L_{AF90}	Day (07:00-23:00)	44
		Night (23:00-07:00)	44
	Range of L_{Amax}	Day (07:00-23:00)	49-91
		Night (23:00-07:00)	48-89
	Average L_{Aeq}	Day (07:00-19:00)	67
		Evening (19:00-23:00)	61
		Night (23:00-07:00)	67

- 6.2.40 Based on the statistical analysis of the $L_{A90,10min}$ measurements, the typical background sound level at U7 was determined to be $44dBL_{A90,1hr}$ during the daytime and $44dBL_{A90,15min}$ during the night-time.
- 6.2.41 The time history graph supports this with a recurring pattern of daytime and nighttime measurements. The baseline conditions are likely driven by the industrial noise from the nearby power station.



Inset 6.37 Histogram of the daytime $L_{A90,10min}$ measurements at U7



Inset 6.38 Histogram of the night-time $L_{A90,10min}$ measurements at U7



Inset 6.39 Graph plotting the time history of measurements at U7

Location U8

- 6.2.42 **Location description:** Teesside Power Ltd TV2 site, off Huntsman Drive. Measurement located next to a boundary fence in the north of the complex in a disused area, facing Dorman's Pool.

Measurement period: Thursday 26/03/2026 13:28 to Wednesday 08/04/2026 12:12

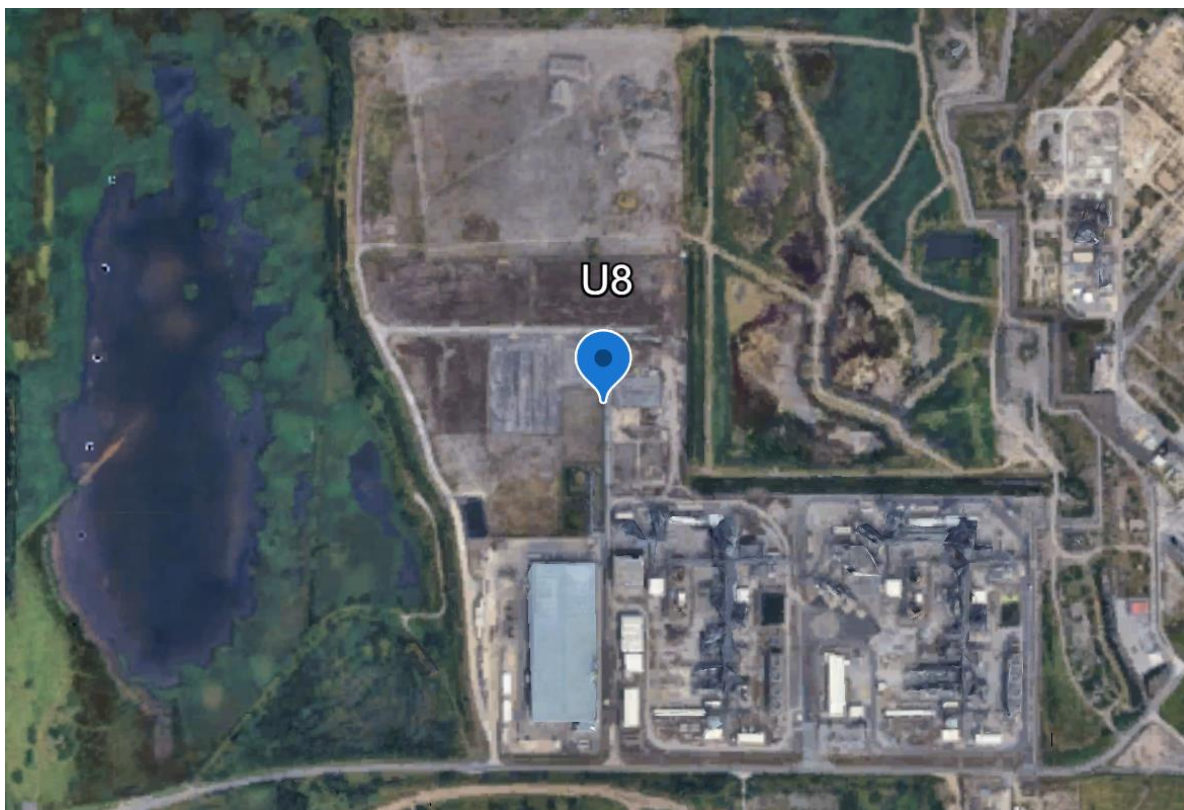
Weather conditions:

Wind speed: Less than 5m/s

Wind direction: Westerly

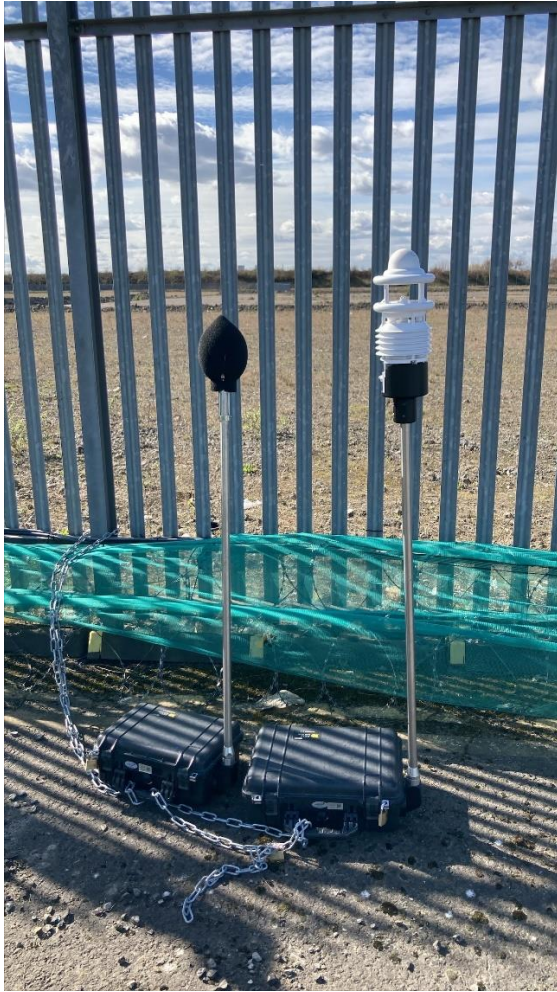
Summary: Dry, occasional cloud cover

- 6.2.43 **Environment and observations:** The dominant noise sources were road traffic from Seaton Carew Road to the west and a continuous industrial noise hum from nearby vent stacks. There were also occasional aircraft flyovers and beeping from distant industrial vehicles.



(Imagery ©2026, Map data ©2026 Google)

Inset 6.40 Location U8 map



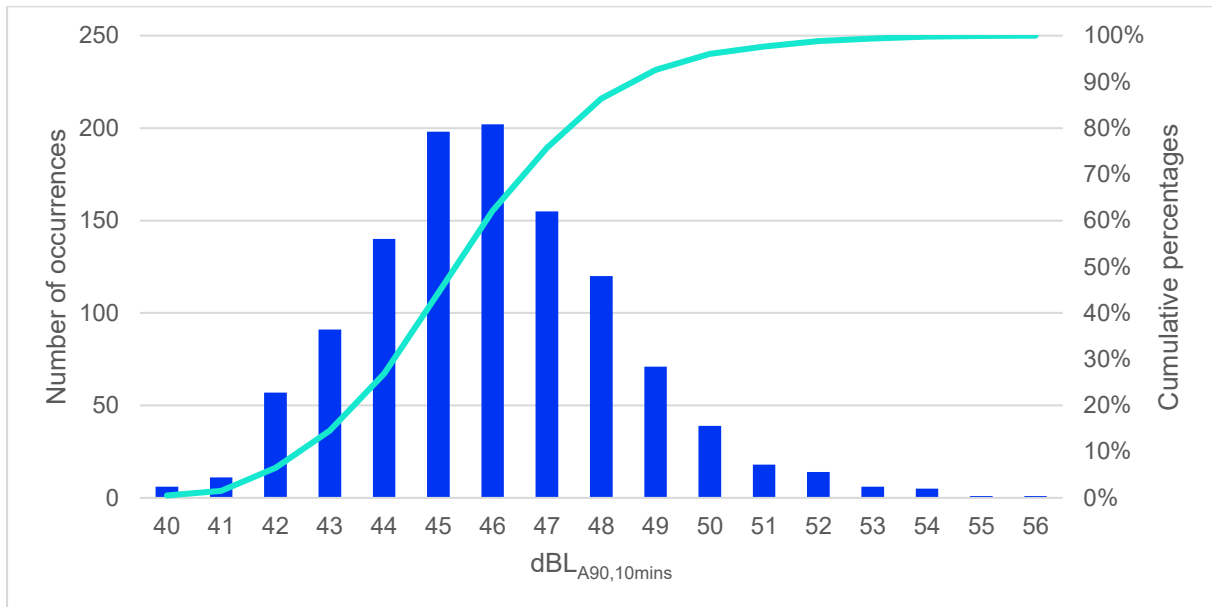
Inset 6.41 **Environmental sound and meteorological measurement setup at location U8**

Table 6.14 **Summary of measurement results at U8**

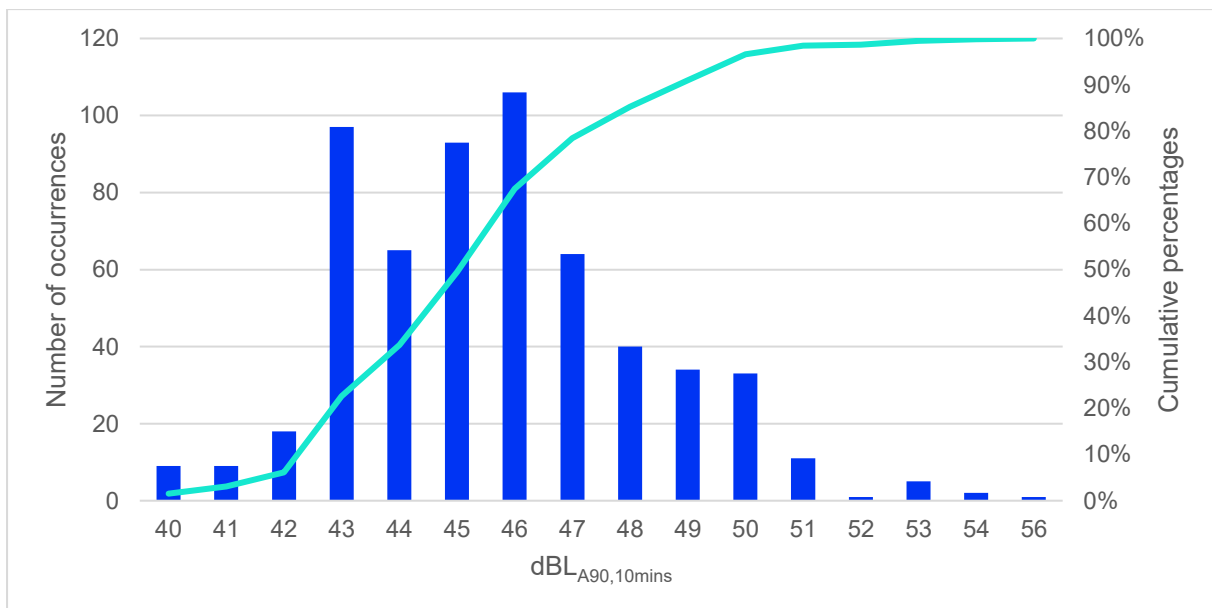
Location	Metric	Time period	Measured sound level, dB(A)
U8	Typical L_{AF90}	Day (07:00-23:00)	46
		Night (23:00-07:00)	43
	Range of L_{Amax}	Day (07:00-23:00)	47-83
		Night (23:00-07:00)	46-80
	Average L_{Aeq}	Day (07:00-19:00)	52
		Evening (19:00-23:00)	51
		Night (23:00-07:00)	49

6.2.44 Based on the statistical analysis of the $L_{A90,10min}$ measurements, the typical background sound level at U8 was determined to be $46dB_{LA90,1hr}$ during the daytime and $43dB_{LA90,15min}$ during the night-time.

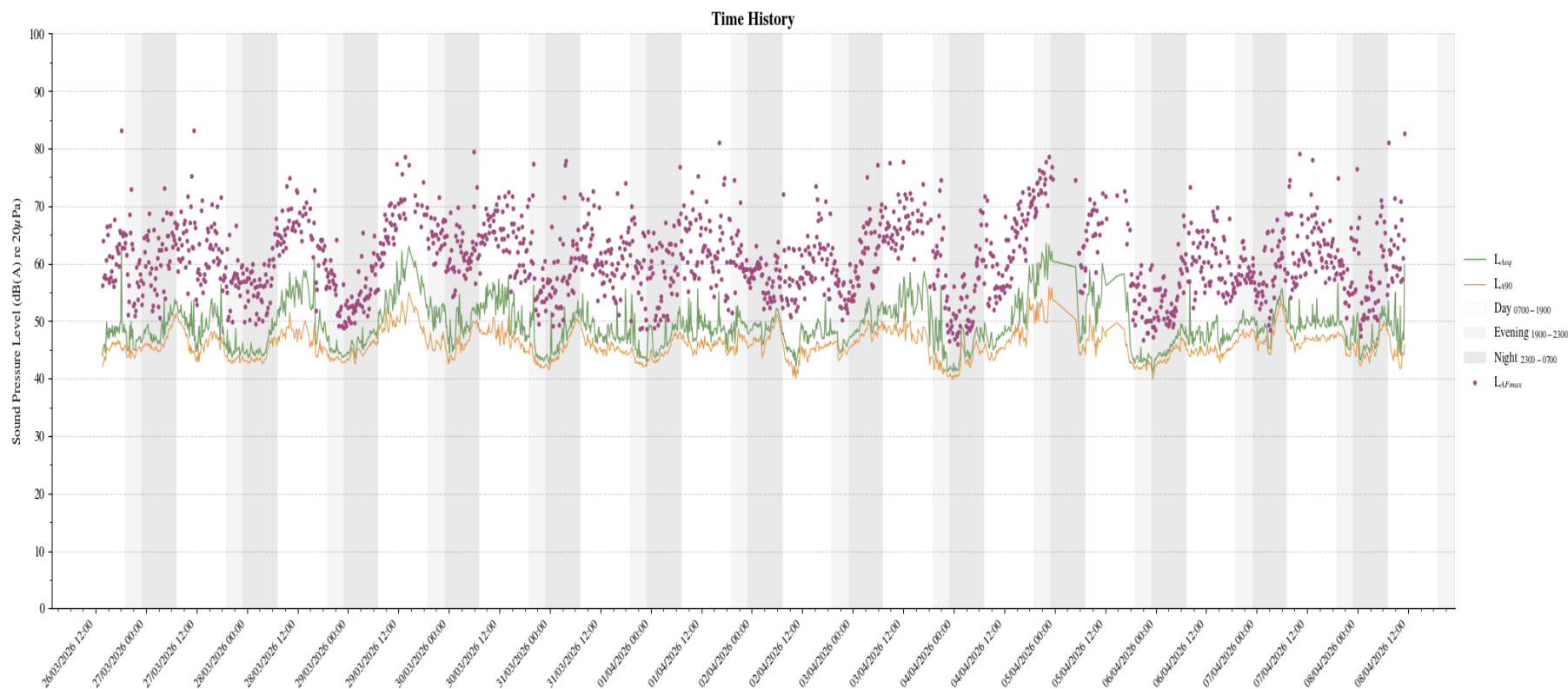
6.2.45 The time history graph supports this with a recurring pattern of daytime and night-time measurements, with the exception of around 4 to 5 April when there was a storm (affected measurements have been excluded from the analysis due to the weather).



Inset 6.42 Histogram of the daytime L_{A90,10min} measurements at U8



Inset 6.43 Histogram of the night-time L_{A90,10min} measurements at U8



Inset 6.44 Graph plotting the time history of measurements at U8

Location U9

6.2.46 **Location description:** LGF Main Site East, quayside. Located at the top of a slipway behind the security fence.

Measurement period: Thursday 26/03/2026 11:49 to Wednesday 08/04/2026 11:33

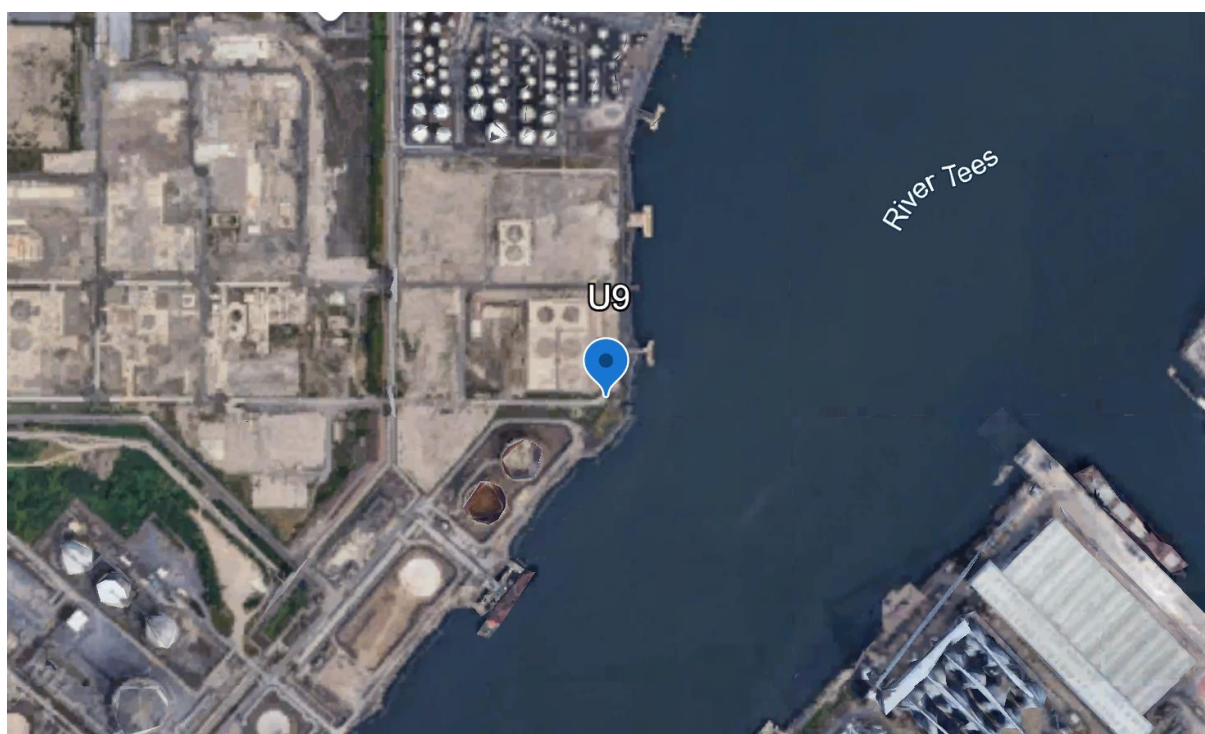
Weather conditions:

Wind speed: Less than 5m/s

Wind direction: Westerly

Summary: Dry, mild cloud cover

6.2.47 **Environment and observations:** The dominant noise source was the continuous industrial hum from across the river to the east, along with distant road traffic noise from the west. Bird and water noise was also present, with occasional aircraft flyovers.



(Imagery ©2026, Map data ©2026 Google)

Inset 6.45 **Location U9 map**



Inset 6.46 **Environmental sound and meteorological measurement setup at location U9**

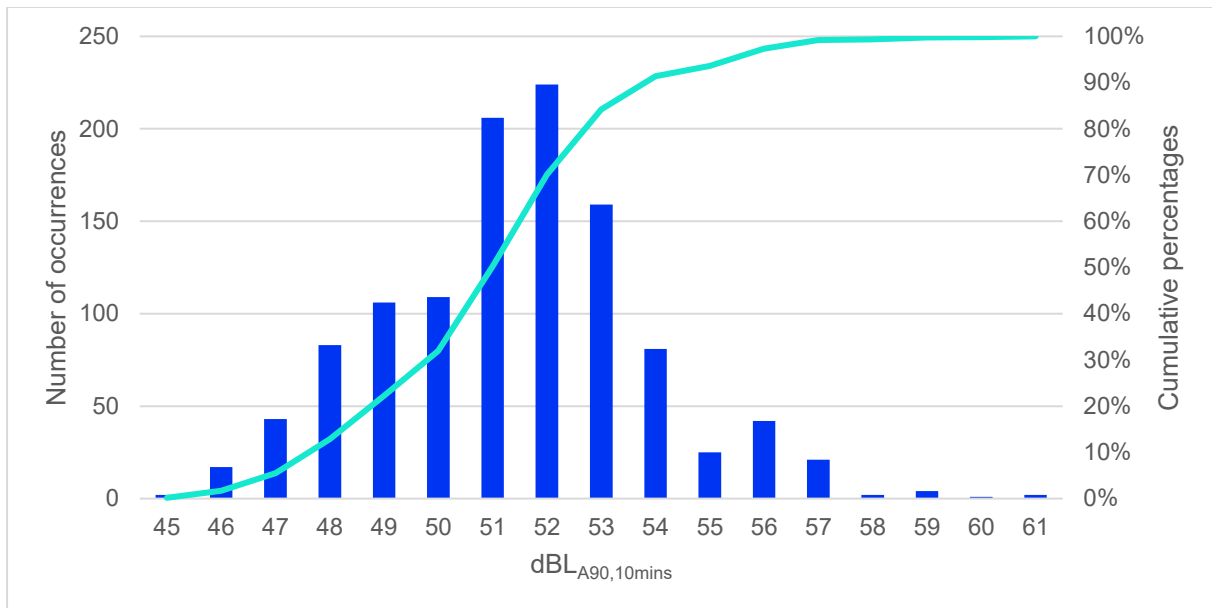
Table 6.15 **Summary of measurement results at U9**

Location	Metric	Time period	Measured sound level, dB(A)
U9	Typical L_{AF90}	Day (07:00-23:00)	52
		Night (23:00-07:00)	52
	Range of L_{Amax}	Day (07:00-23:00)	51-87
		Night (23:00-07:00)	52-83
	Average L_{Aeq}	Day (07:00-19:00)	55
		Evening (19:00-23:00)	54
		Night (23:00-07:00)	54

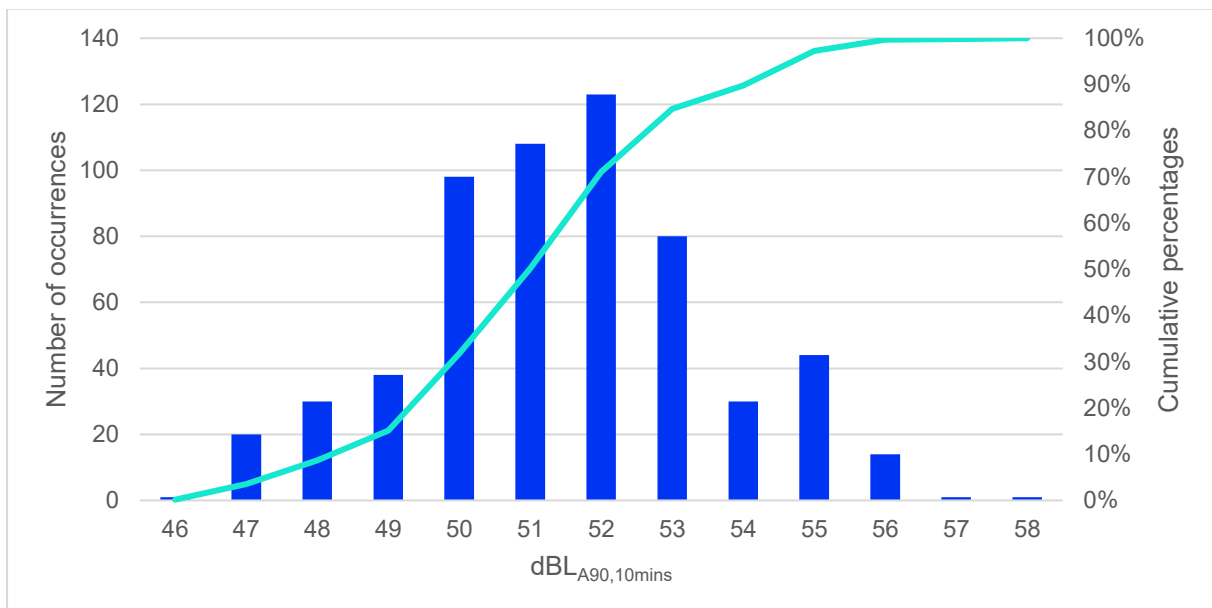
6.2.48 Based on the statistical analysis of the $L_{A90,10min}$ measurements, the typical background sound level at U9 was determined to be $52dB_{LA90,1hr}$ during the daytime and $52dB_{LA90,15min}$ during the night-time. The background sound level is likely driven by the continuous industrial noise from nearby industrial sites and water noise from the slipway and River Tees.

6.2.49 The time history graph supports this, as the $L_{A90,10min}$ appears to be relatively constant throughout the daytime and night-time on multiple days, with the exception of some higher noise level events, such as the storm on

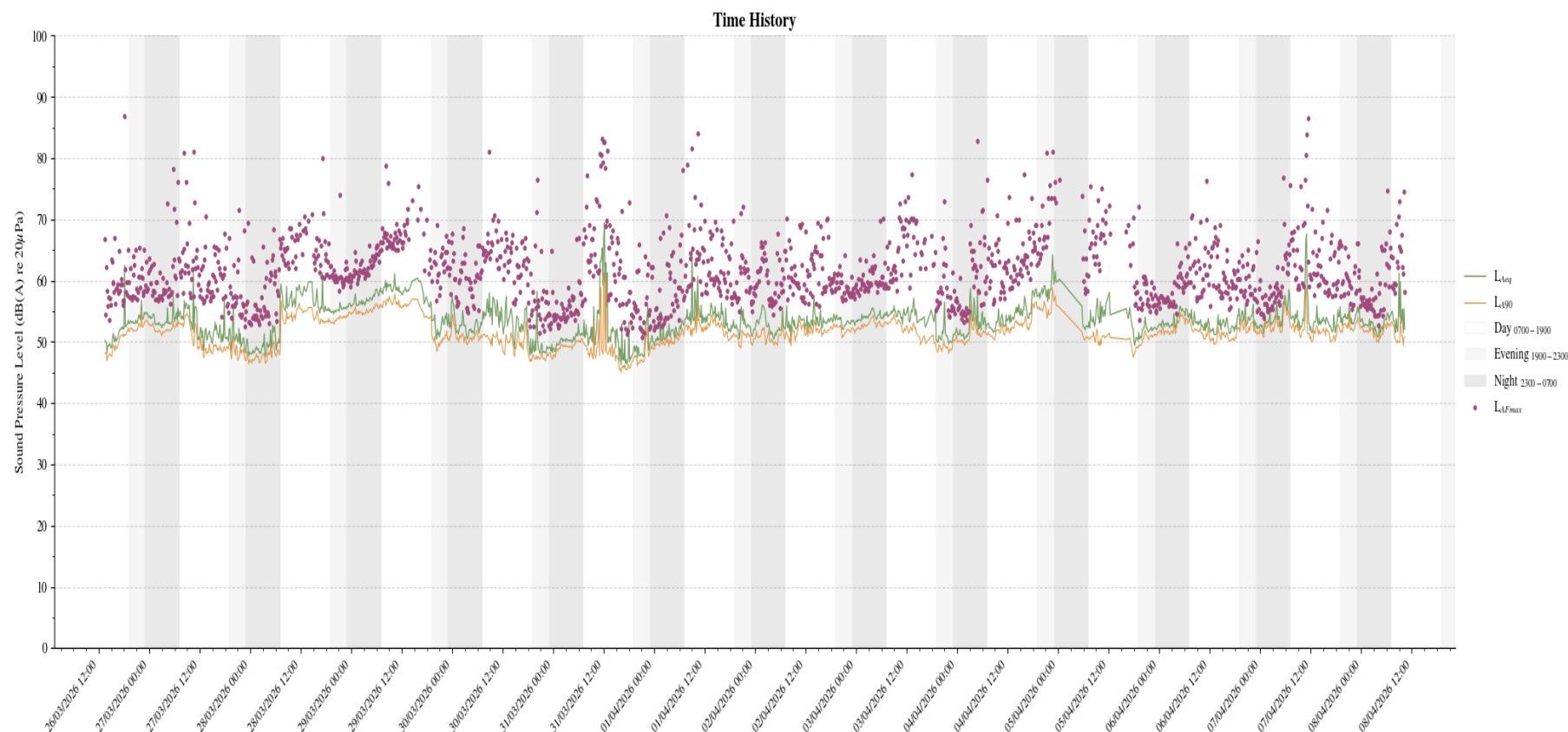
4 to 5 April (some of these measurements have been excluded due to the weather).



Inset 6.47 Histogram of the daytime $L_{A90,10min}$ measurements at U9



Inset 6.48 Histogram of the night-time $L_{A90,10min}$ measurements at U9



Inset 6.49 Graph plotting the time history of measurements at U9

Location NML2

6.2.50 Measurement were taken at NML2 from a previous survey collected by Lighthouse Green Fuels Ltd in 2024 (unpublished).

6.2.51 Table outlines the location of NML2.

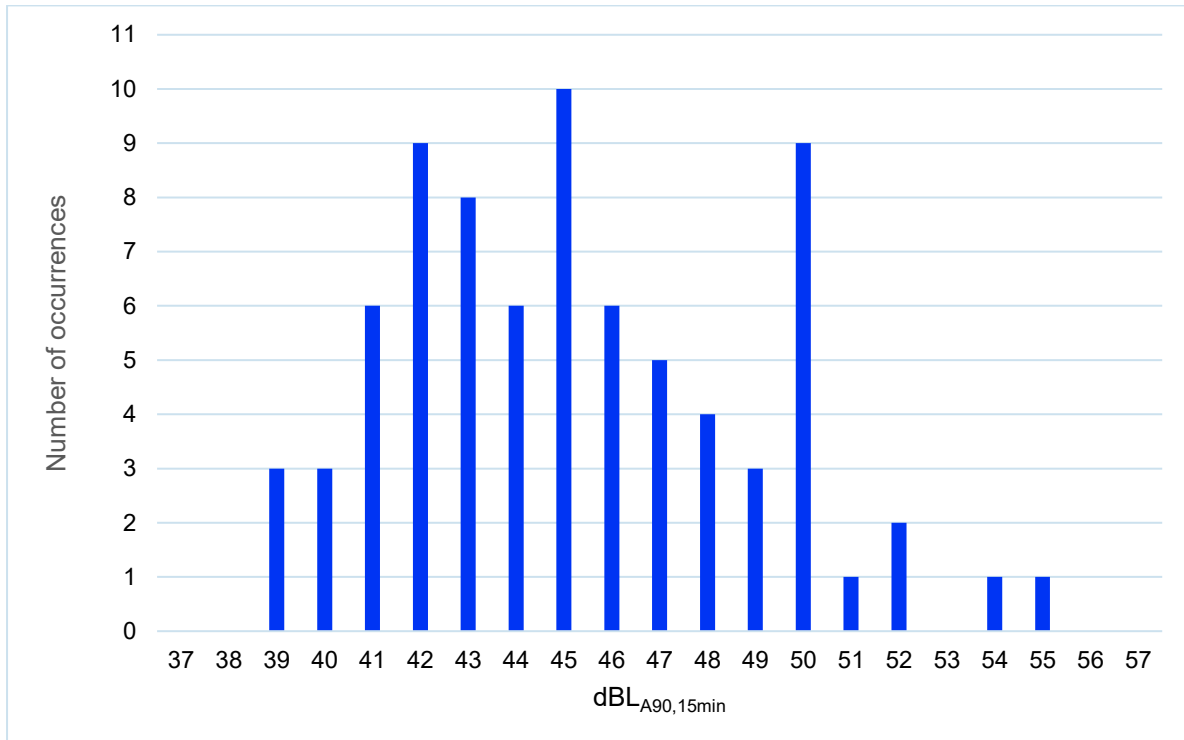
Table 6.16 NML2 baseline monitoring location

ID	Location	Date and time	Description of noise environment
NML2	RSPB/Teesside Environmental Trust land to north of Samphire Street	12/10/2023 09:00 to 13/10/2023 12:15	Daytime: Dominated by local traffic noise; contributions from industrial noise sources. Nighttime: Traffic noise through early part of night, while industrial noise from 24hr facilities dominates in the latter part of the night-time period.

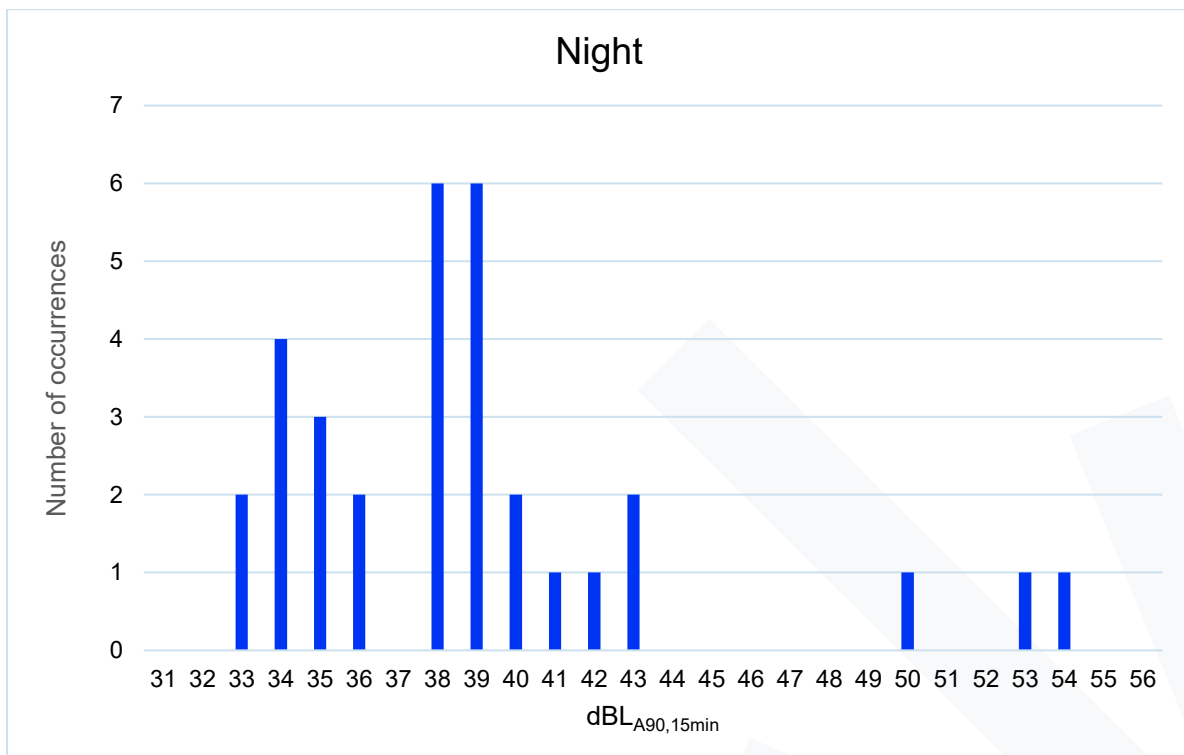
6.2.52 Table outlines the summary of measurement results at NML2, as well as the typical background sound level determined by the statistical analysis shown in Inset 6.50 and Inset 6.51.

Table 6.17 Summary of measurement results at NML2

Metric	Daytime (07:00-23:00)	Night-time (23:00-07:00)
Arithmetic average $L_{A90,15min}$	45	39
Mode $L_{A90,T}$	45	39
Maximum $L_{A90,T}$	55	54
Minimum $L_{A90,T}$	39	33
Typical background sound level	45	38



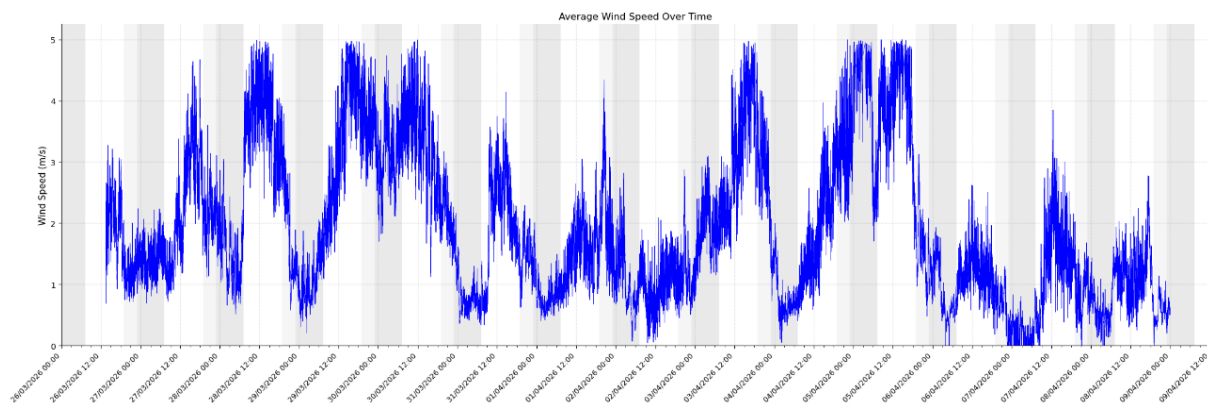
Inset 6.50 Histogram of the daytime $L_{A90,15min}$ measurements at NML2



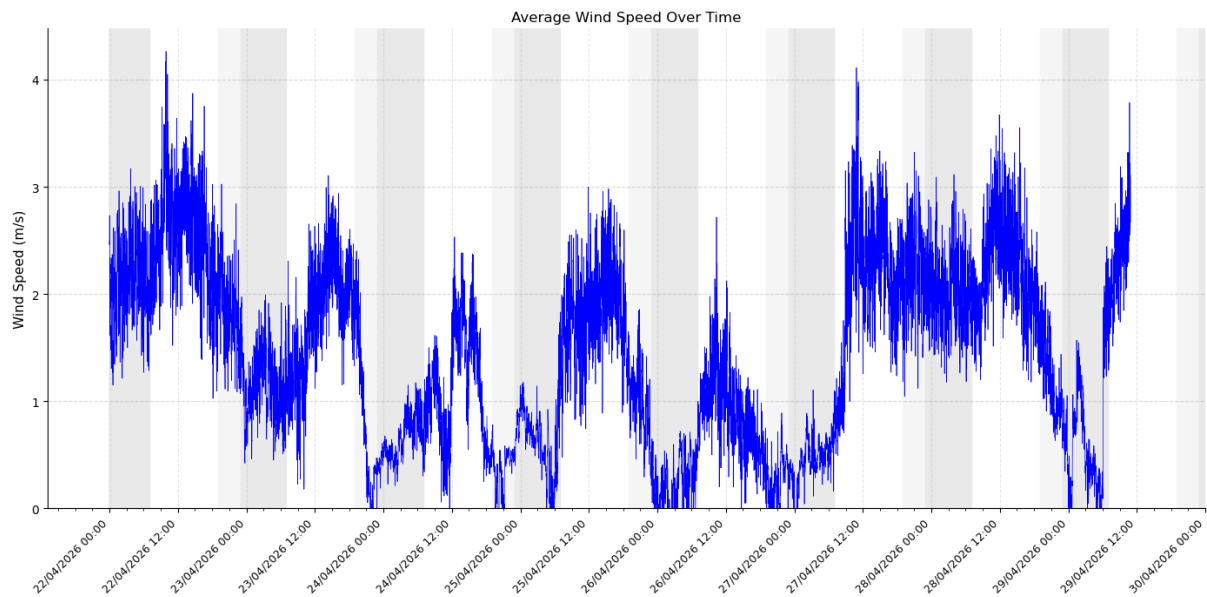
Inset 6.51 Histogram of the night-time $L_{A90,15min}$ measurements at NML2

6.3 Meteorological conditions

- 6.3.1 Throughout the unattended measurement period, a weather station was installed at Location U8. During the measurement periods, any occurrences of wind speed equal to/exceeding 5m/s were identified and the measurement data during these periods was excluded from the results.
- 6.3.2 Inset 6.52 to Inset 6.53 shows the prevailing wind headings during the measurement periods. The average wind speed displayed only includes measurement data coinciding to the noise data displayed in the previous chapter. Where wind speeds were above 5 m/s, noise measurement data has not been included in data analysis, such as some periods in the measurement period of 26 March to 8 April. Approximately 2% of noise measurements were excluded from the data analysis on this basis.
- 6.3.3 The average wind speeds during the measurement period of 22 to 29 April did not approach 5 m/s, therefore no data was excluded from this measurement period.



Inset 6.52 Average wind speed over measurement period 26/03/26 to 08/04/26



Inset 6.53 Average wind speed during measurement period 22/04/26 to 29/04/26

References

- Ref 1 British Standards Institute (2019) BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound.
- Ref 2 The Association of Noise Consultants (ANC) (2020) BS4142:2014+A1:2019 Technical Note. Available online: <https://www.association-of-noise-consultants.co.uk/wp-content/uploads/2020/05/ANC-BS-4142-Guide-March-2020.pdf>. [Accessed April 2026].
- Ref 3 British Standards Institute (2013) BS EN 61672-1:2013 Electroacoustics. Sound level meters.



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