

Keuper Gas Storage Project

Appendix 9A – Baseline Noise Assessment PREPARED FOR

Keuper Gas Storage

Limited

DATE

September2025

REFERENCE

EN0310001



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ACRONYMS AND ABBREVIATIONS

Acronym	Description
DCO	Development Consent Order
EIA	Environmental Impact Assessment
ERM	Environmental Resources Management
ES	Environmental Statement
KGSL	Keuper Gas Storage Limited
KGSP	Keuper Gas Storage Project
MC	Material Change
PEIR	Preliminary Environmental Information Report
L _{Aeq} ,T	Equivalent Continuous A-weighted Sound Pressure Level over a specified time period (T)
L _{Amax}	Maximum A-weighted sound level measured over a specific time period (T).
L _{A90,T}	A-weighted sound pressure level that is exceeded for 90% of a given measurement period (T)



Acronym	Description
dBA (A- weighted)	Sound measurement that has been adjusted to reflect how the human ear perceives loudness across different frequencies



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NOISE SURVEY SUMMARY

9.1.1.1 This appendix presents details of the data recorded during the noise survey and the analysis that has been carried out to derive baseline noise levels that were used in the assessment.

- 9.1.1.2 Noise monitoring was carried out from 29^{th} July to 6^{th} August 2025. The noise survey consisted of unattended noise monitoring across six locations set to measure: $L_{Aeq,T}$, L_{Amax} and $L_{A90,T}$.
- 9.1.1.3 A weather station was deployed at Noise Monitoring Location 02 (NML02) to measure wind speed and rainfall. Noise measurements captured during periods of wind speeds above 5 m/s and/or rainfall have been excluded from the data analysis.
- 9.1.1.4 A summary of the results has been provided in **Table 9.1**. Details of the monitoring location descriptions, equipment used, weather conditions and data analysis are provided in the sections that follow.

TABLE 9.1 - NOISE MONITORING RESULTS SUMMARY

Noise monitoring location	Ambient Sound Level L _{Aeq,T} [dB] ^a			Representative Background Sound Level L _{A90,T} [dB]	
	Day ^b	Evenings & Weekends c	Night ^d	Day ^e	Night ^f
NML01	59	56	53	50	33
NML02	56	51	49	45	34
NML03	56	51	49	38	31
NML04	53	48	47	36	30
NML05	51	47	44	35	29
NML06	53	48	45	38	30

Notes:

Sundays 07:00-23:00.



^a Façade levels (the measurement or calculation of sound levels at a specific distance in front of a building's façade). A of 3 dB is applied to account for the sound reflected from the façade.

^b Weekdays 07:00-19:00 and Saturday 07:00-13:00.

 $^{^{\}rm c}$ Weekdays, 19:00–23:00, Saturdays 13:00-23:00, and

^d Every night 23:00-07:00.

e Every day 07:00-23:00

9.1.2 NOISE MONITORING LOCATION DESCRIPTIONS

9.1.2.1 A consultation email was sent to Cheshire and West Chester Council (the LPA) on 25th June 2025 setting out the proposed noise monitoring locations. Alternative monitoring locations were selected in some instances whilst onsite due to the site conditions. The alternative locations were observed to consist of a similar noise environment as those proposed to the LPA and therefore considered acceptable.

9.1.2.2 Descriptions of the monitoring locations are presented in **Table 9.2**. The locations of the proposed and actual measurement locations are shown in Figure 9.1.



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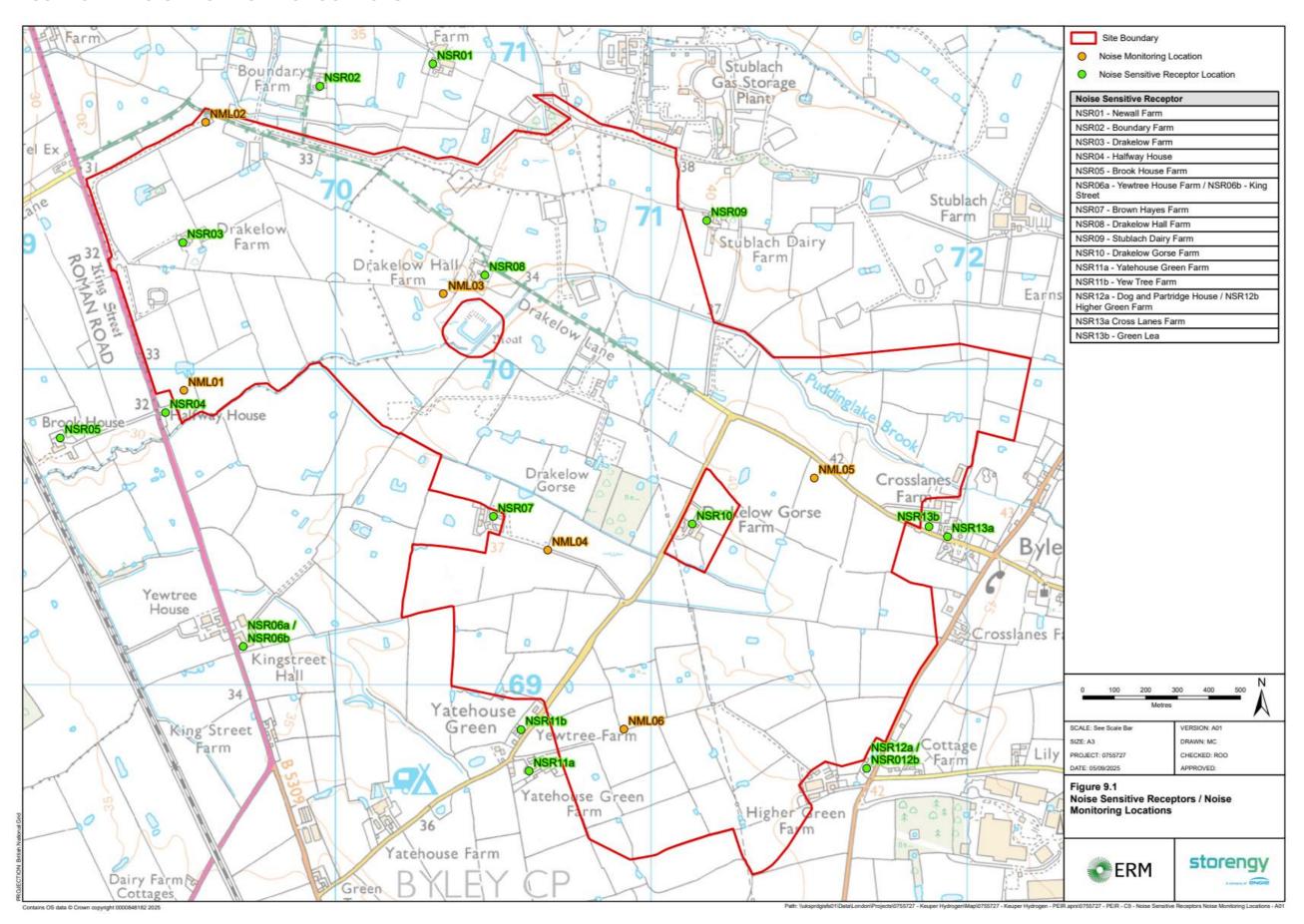
NOISE SURVEY SUMMARY

TABLE 9.2 - NOISE MONITORING LOCATION DESCRIPTIONS

Location	Representative Receptor	Installation Description	Observations during Installation
NML01	NSR04 Halfway House, NSR05 Brook House, NSR06a Yewtree House NSR06b Kingstreet	Equipment installed within land parcel between Halfway House and the Proposed Development GPP more than 3 m away from reflective surfaces and 1.5 m above ground.	Noise levels are dominated by road traffic along King St. Other notable noise sources include birdsong and occasional aircraft passes.
NML02	NSR01 Newall Farm NSR02 Boundary Farm, NSR03 Drakelow Farm	Equipment installed along access road to the Storengy Site offices. Microphone installed at 1.5 m above ground. The weather station was also installed in this location.	Noise levels are dominated by road traffic along King St. Noise from car passes along the access road was also noted, however these were observed to be infrequent and did not affect overall measurement results.
NML03	NSR08 Drakelow Hall Farm, NSR09 Stublach Dairy Farm	Equipment installed more than 2 m away from reflective surfaces. Microphone installed at 1.5 m above ground.	Audible noise sources during installation include distant road traffic, birdsong and leaves rustling in the wind.
NML04	NSR07 Brownhayes Farm NSR10 Drakelow Gorse Farm	Equipment installed off the access road leading to Brown Hayes Farm. Microphone installed 1.5 m at above ground.	Audible noise sources during installation include distant road traffic, birdsong, occasional plane passes. No car passes along the access road were observed during installation.
NML05	NSR13a Crosslanes Farm NSR13b Green Lea	Microphone installed more than 3 m away from reflective surfaces and 1.5 m above ground.	Noise levels are dominated by road traffic along Drakelow Ln.
NML06	NSR11a Yatehouse Green Farm NSR11b Yewtree Farm NSR12a Dog and Partridge Farm NSR12b Higher Green Farm	Microphone installed more than 3 m away from reflective surfaces and 1.5 m above ground.	Noise levels are dominated by road traffic along Yatehouse Ln and King St.



FIGURE 9.1 - NOISE MONITORING LOCATIONS



9.1.3 EQUIPMENT USED

9.1.3.1 Details of the equipment used, including serial numbers are provided in **Table 9.3**.

TABLE 9.3 - EQUIPMENT DETAILS

Equipment Type	Manufacturer	Model	Serial Number	Meas. Location
Sound	Rion	NL-53	00452037	NML01
Level Meter		NL-52	510132	NML02
		NL-52	520989	NML03
		NL-52	1276547	NML04
		NL-53	00452035	NML05
		NL-52	510130	NML06
Calibrator	Rion	NC-70	35105087	-
Weather Station	Davies & HoboWare	EnviroTrack	22175775	NML02

9.1.4 WEATHER CONDITIONS

9.1.4.1 The observed weather conditions were generally acceptable for acoustic measurement with short periods of rainfall. Noise measurements affected by rainfall and high wind speeds (>5 m/s) have been removed from the data analysis. The data exclusions account for approximately 25 instances of rainfall and/or high wind speeds during the 29th July, 30th July, 3rd August and 4th August. Exclusions are shown in the noise monitoring result graphs.

9.1.5 OTHER DATA EXCLUSIONS

9.1.5.1 Measurements affected by atypical noise sources have been excluded from the data analysis. Exclusions are shown in the noise monitoring result graphs.



9.1.6 DETAILED RESULTS AND ANALYSIS

NML01 - Halfway House, Brook House, Yewtree House and **Kingstreet**

- Figure 9.2 shows the monitoring equipment setup at NML01. Figure 9.1.6.2 **9.3** presents the 15-minute sound measurements logged over the survey period. Noise levels were monitored from 19:00 on 29th July until 11:30 on 6th August 2025.
- **Table 9.4** presents the average daytime ambient sound levels for the 9.1.6.3 construction assessment baseline. BS 5228-1:2009 + A1:2014 ABC construction noise level categories have been selected based on the logarithmic average of the ambient sound levels.
- Figure 9.4 presents the distribution of background LA90.15-minute sound 9.1.6.4 levels over the day and night-time throughout the survey period. The adopted daytime and night-time LA90.T are 50 dB and 33 dB respectively for the noise sensitive receptors represented by NML01.

FIGURE 9.2 - PHOTO OF EQUIPMENT SETUP AT NML01





TABLE 9.4 – AMBIENT SOUND LEVEL FOR THE CONSTRUCTION NOISE ASSESSMENT AT NML01

Day	Ambient Sound Level LAeq,T [dB] a			
	Day b	Evenings & Weekends c	Night d	
29-Jul	-	56	50	
30-Jul	58	54	52	
31-Jul	59	57	53	
01-Aug	57	55	53	
02-Aug	57	56	53	
03-Aug	-	57	51	
04-Aug	62	58	54	
05-Aug	61	57	56	
06-Aug	58	-	55	



^a Façade levels levels (the measurement or calculation of sound levels at a specific distance in front of a building's façade). A of 3 dB is applied to account for the sound reflected from the façade.

^b Weekdays 07:00-19:00 and Saturday 07:00-13:00.

^c Weekdays, 19:00–23:00, Saturdays 13:00-23:00, and Sundays 07:00-23:00.

FIGURE 9.3 - NOISE MONITORING RESULTS AT NML01

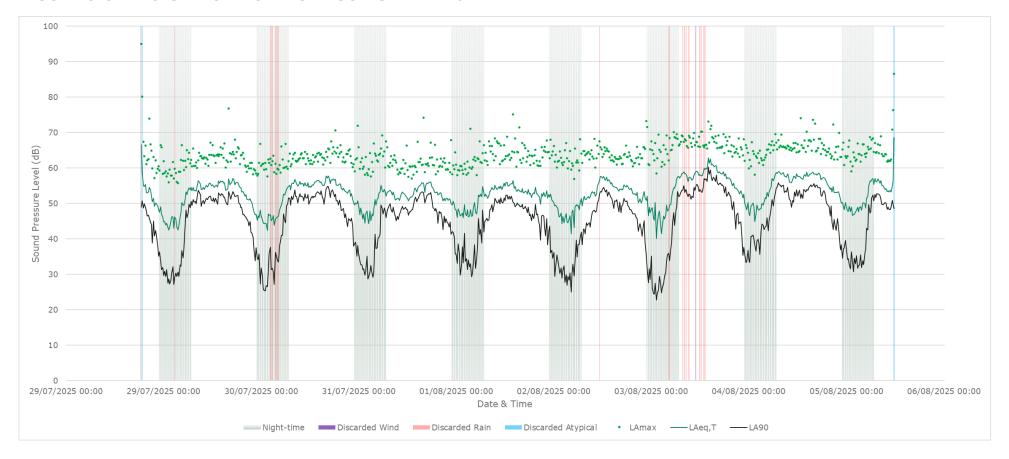
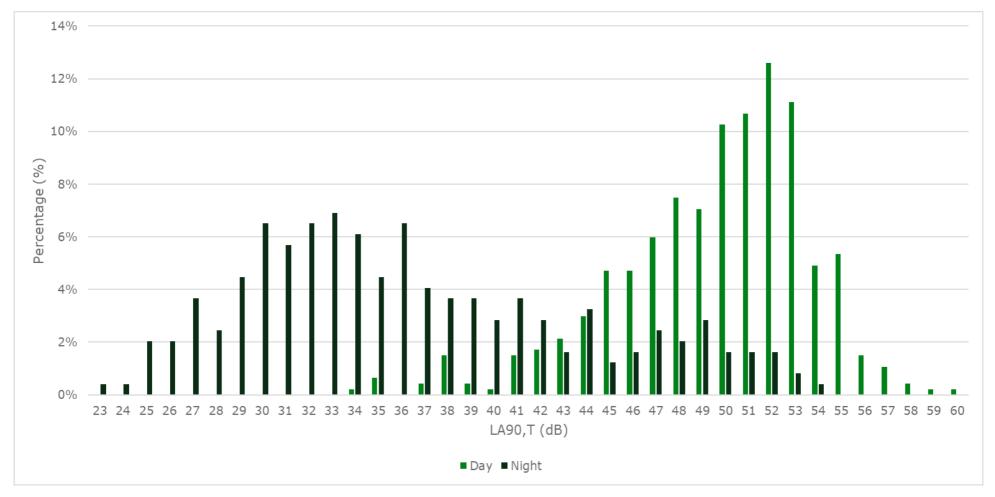


FIGURE 9.4 - DISTRIBUTION OF BACKGROUND SOUND LEVELS DURING THE DAY (07:00-23:00) AND NIGHT (23:00-07:00) AT NML01





NML02 - Newall Farm, Boundary Farm and Drakelow Farm

9.1.6.5 **Figure 9.5** shows the monitoring equipment setup at NML02 **Figure 9.6** presents the 15-minute sound measurements logged over the survey period. Noise levels were monitored from 13:45 on 29th July until 14:00 on 6th August 2025.

9.1.6.6

- 9.1.6.7 **Table** 9.5 presents the average daytime ambient sound levels for the construction assessment baseline. BS 5228-1:2009 + A1:2014 ABC construction noise level categories have been selected based on the logarithmic average of the ambient sound levels.
- 9.1.6.8 **Figure 9.7** presents the distribution of background $L_{A90,15\text{-minute}}$ sound levels over the day and night-time throughout the survey period. The adopted daytime and night-time $L_{A90,T}$ are 45 dB and 34 dB respectively for the noise sensitive receptors represented by NML02.

FIGURE 9.5 - PHOTO OF EQUIPMENT SETUP AT NML02





TABLE 9.5 – AMBIENT SOUND LEVEL FOR THE CONSTRUCTION NOISE ASSESSMENT AT NML02

Day	Ambient Sound Level LAeq,T [dB] a			
	Day b	Evenings & Weekends c	Night d	
29-Jul	53	51	45	
30-Jul	55	48	49	
31-Jul	60	52	50	
01-Aug	53	51	49	
02-Aug	55	51	48	
03-Aug	-	52	46	
04-Aug	58	52	50	
05-Aug	57	52	52	
06-Aug	54	-	50	



^a Façade levels levels (the measurement or calculation of sound levels at a specific distance in front of a building's façade). A of 3 dB is applied to account for the sound reflected from the façade.

^b Weekdays 07:00-19:00 and Saturday 07:00-13:00.

^c Weekdays, 19:00–23:00, Saturdays 13:00-23:00, and Sundays 07:00-23:00.

FIGURE 9.6 - NOISE MONITORING RESULTS AT NML02

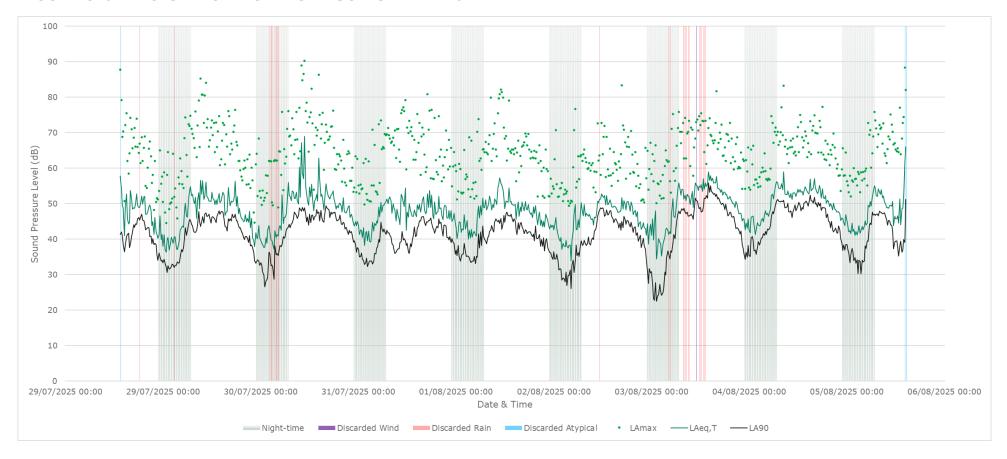
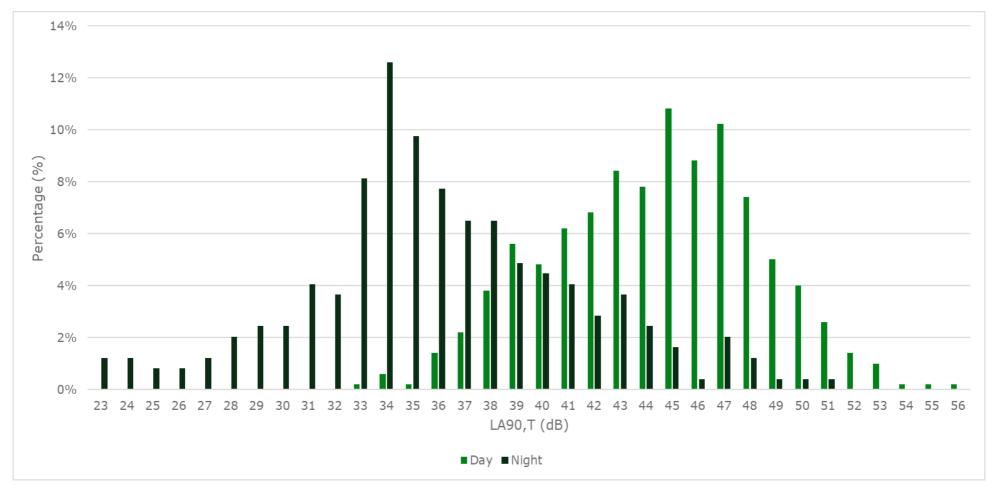


FIGURE 9.7 - DISTRIBUTION OF BACKGROUND SOUND LEVELS DURING THE DAY (07:00-23:00) AND NIGHT (23:00-07:00) AT NML02





NML03 - Drakelow Fall Farm, and Stublach Dairy Farm

- Figure 9.8 shows the monitoring equipment setup at NML03 Figure **9.9** presents the 15-minute sound measurements logged over the survey period. Noise levels were monitoring from 15:15 on 29th July until 13:45 on 6th August 2025.
- 9.1.6.10 **Table 9.6** presents the average daytime ambient sound levels for the construction assessment baseline. BS 5228-1:2009 + A1:2014 ABC construction noise level categories have been selected based on the logarithmic average of the ambient sound levels.
- 9.1.6.11 Figure 9.10 presents the distribution of background LA90.15-minute sound levels over the day and night-time throughout the survey period. The adopted daytime and night-time LA90,T are 38 dB and 31 dB respectively for the noise sensitive receptors represented by NML03

FIGURE 9.8 - PHOTO OF EQUIPMENT SETUP AT NML03





TABLE 9.6 – AMBIENT SOUND LEVEL FOR THE CONSTRUCTION NOISE ASSESSMENT AT NML03

Day	Ambient Sound Level LAeq,T [dB] a			
	Day b	Evenings & Weekends c	Night d	
29-Jul	46	47	44	
30-Jul	49	47	44	
31-Jul	49	47	44	
01-Aug	47	44	45	
02-Aug	50	48	45	
03-Aug	-	47	44	
04-Aug	53	48	45	
05-Aug	52	47	47	
06-Aug	52	-	47	



^a Façade levels levels (the measurement or calculation of sound levels at a specific distance in front of a building's façade). A of 3 dB is applied to account for the sound reflected from the façade.

^b Weekdays 07:00-19:00 and Saturday 07:00-13:00.

^c Weekdays, 19:00–23:00, Saturdays 13:00-23:00, and Sundays 07:00-23:00.

FIGURE 9.9 - NOISE MONITORING RESULTS AT NML03

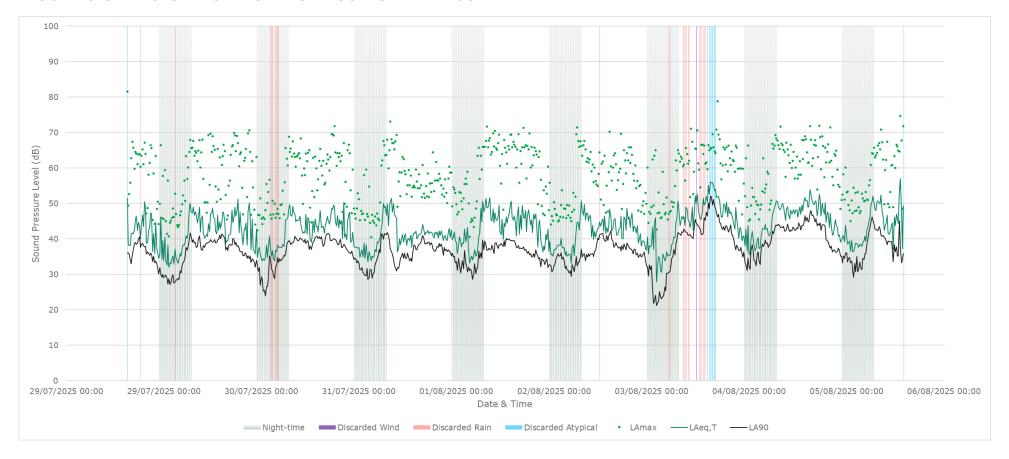
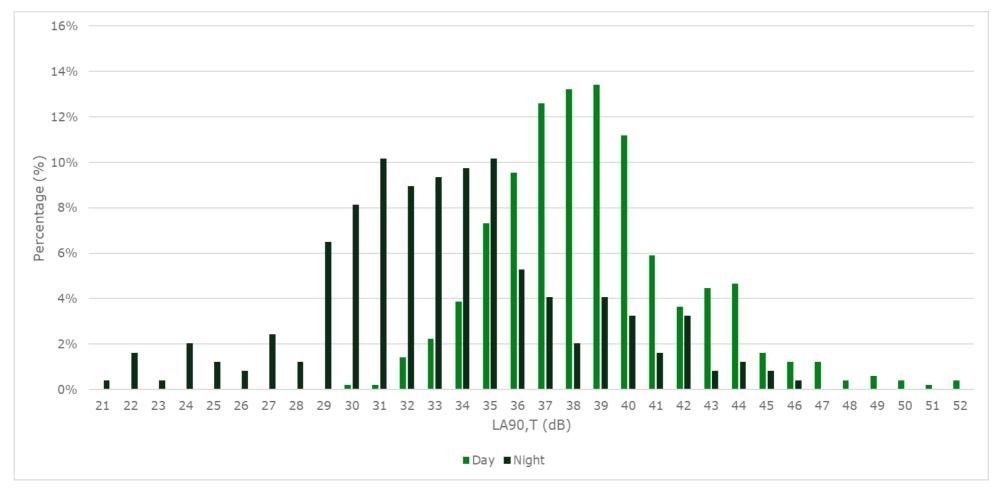


FIGURE 9.10 - DISTRIBUTION OF BACKGROUND SOUND LEVELS DURING THE DAY (07:00-23:00) AND NIGHT (23:00-07:00) AT NML03





NML04 - Brownhayes Farm and Drakelow Gorse Farm.

- 9.1.6.12 **Figure 9.11** shows the monitoring equipment setup at NML04. Figure 9.12 presents the 15-minute sound measurements logged over the survey period. Noise levels were monitored from 15:45 on 29th July until 12:45 on 6th August 2025.
- 9.1.6.13 **Table 9.7** presents the average daytime ambient sound levels for the construction assessment baseline. BS 5228-1:2009 + A1:2014 ABC construction noise level categories have been selected based on the logarithmic average of the ambient sound levels.
- 9.1.6.14 Figure 9.13 presents the distribution of background LA90.15-minute sound levels over the day and night-time throughout the survey period. The adopted daytime and night-time LA90,T are 36 dB and 30 dB respectively for the noise sensitive receptors represented by NML04.

FIGURE 9.11 - PHOTO OF EQUIPMENT SETUP AT NML04





TABLE 9.7 – AMBIENT SOUND LEVEL FOR THE CONSTRUCTION NOISE ASSESSMENT AT NML04

Day	Ambient Sound Level LAeq,T [dB] a			
	Day b	Evenings & Weekends c	Night d	
29-Jul	48	48	42	
30-Jul	51	49	44	
31-Jul	51	50	51	
01-Aug	51	45	46	
02-Aug	51	49	46	
03-Aug	-	48	46	
04-Aug	59	49	49	
05-Aug	54	49	49	
06-Aug	50	-	47	

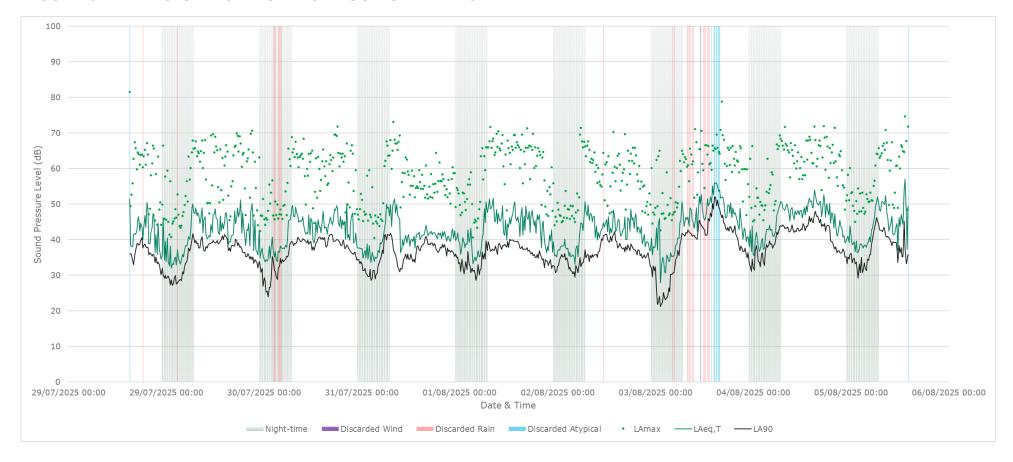


^a Façade levels levels (the measurement or calculation of sound levels at a specific distance in front of a building's façade). A of 3 dB is applied to account for the sound reflected from the façade.

^b Weekdays 07:00-19:00 and Saturday 07:00-13:00.

^c Weekdays, 19:00–23:00, Saturdays 13:00-23:00, and Sundays 07:00-23:00.

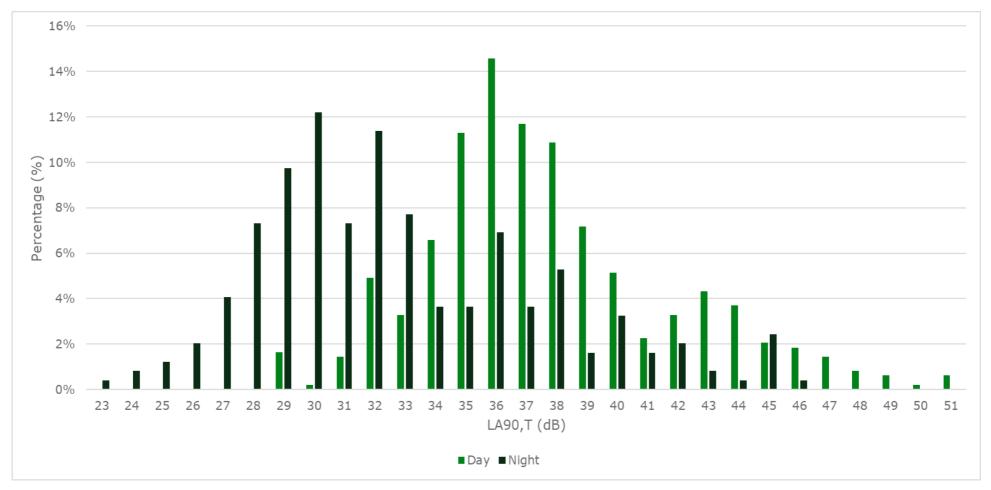
FIGURE 9.12 - NOISE MONITORING RESULTS AT NML04



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FIGURE 9.13 - DISTRIBUTION OF BACKGROUND SOUND LEVELS DURING THE DAY (07:00-23:00) AND NIGHT (23:00-07:00) AT NML04





NML05 - Crosslanes Farm and Green Lea

9.1.6.15 **Figure 9.14** shows the monitoring equipment setup at NML05. Figure 9.15 presents the 15-minute sound measurements logged over the survey period. Noise levels were monitored from 17:45 on 29th July until 13:00 on 6th August 2025.

- 9.1.6.16 Table 9.8 Ambient Sound level for the Construction Noise Assessment at NML05presents the average daytime ambient sound levels for the construction assessment baseline. BS 5228-1:2009 + A1:2014 ABC construction noise level categories have been selected based on the logarithmic average of the ambient sound levels.
- 9.1.6.17 **Figure 9.16** presents the distribution of background L_{A90.15-minute} sound levels over the day and night-time throughout the survey period. The adopted daytime and night-time L_{A90,T} are 35 dB and 29 dB respectively for the noise sensitive receptors represented by NML05.

FIGURE 9.14 - PHOTO OF EQUIPMENT SETUP AT NML05





TABLE 9.8 – AMBIENT SOUND LEVEL FOR THE CONSTRUCTION NOISE ASSESSMENT AT NML05

Day	Ambient Sound Level LAeq,T [dB] a			
	Day b	Evenings & Weekends c	Night d	
29-Jul	48	48	42	
30-Jul	50	45	43	
31-Jul	50	47	44	
01-Aug	48	43	45	
02-Aug	50	49	45	
03-Aug	-	48	43	
04-Aug	52	48	45	
05-Aug	55	47	46	
06-Aug	51	-	45	



^a Façade levels levels (the measurement or calculation of sound levels at a specific distance in front of a building's façade). A of 3 dB is applied to account for the sound reflected from the façade.

^b Weekdays 07:00-19:00 and Saturday 07:00-13:00.

^c Weekdays, 19:00–23:00, Saturdays 13:00-23:00, and Sundays 07:00-23:00.

FIGURE 9.15 - NOISE MONITORING RESULTS AT NML05

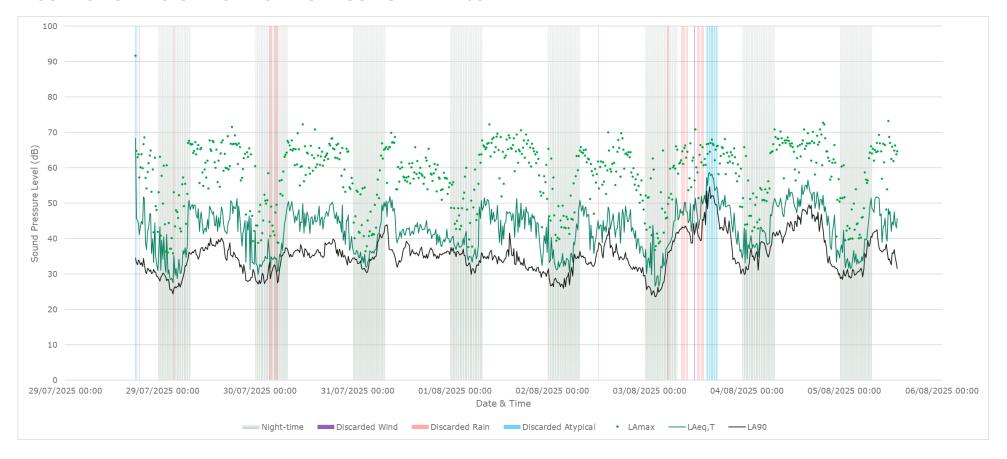
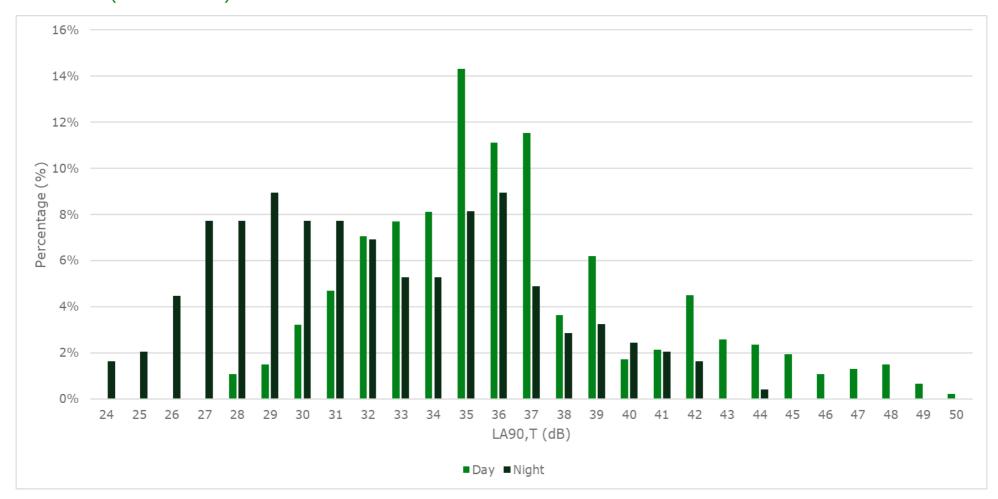


FIGURE 9.16 - DISTRIBUTION OF BACKGROUND SOUND LEVELS DURING THE DAY (07:00-23:00) AND NIGHT (23:00-07:00) AT NML05





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NML06 - Yatehouse Green Farm, Yewtree Farm, Dog and **Partridge Farm and Higher Green Farm**

- 9.1.6.18 **Figure 9.17** shows the monitoring equipment setup at NML06. Figure 9.18 presents the 15-minute sound measurements logged over the survey period. Noise levels were monitored from 16:45 on 29th July until 12:00 on 6th August 2025.
- 9.1.6.19 **Table 9.9** presents the average daytime ambient sound levels for the construction assessment baseline. BS 5228-1:2009 + A1:2014 ABC construction noise level categories have been selected based on the logarithmic average of the ambient sound levels.
- 9.1.6.20 **Figure 9.19** presents the distribution of background L_{A90,15-minute} sound levels over the day and night-time throughout the survey period. The adopted daytime and night-time L_{A90.T} are 38 dB and 30 dB respectively for the noise sensitive receptors represented by NMI 06.

FIGURE 9.17 - PHOTO OF EQUIPMENT SETUP AT NML06





TABLE 9.9 – AMBIENT SOUND LEVEL FOR THE CONSTRUCTION NOISE ASSESSMENT AT NML06

Day	Ambient Sound Level LAeq,T [dB] a		
	Day b	Evenings & Weekends c	Night d
29-Jul	48	49	42
30-Jul	50	45	43
31-Jul	49	47	43
01-Aug	47	43	45
02-Aug	50	48	45
03-Aug	-	48	43
04-Aug	57	53	45
05-Aug	58	47	51
06-Aug	49	-	43

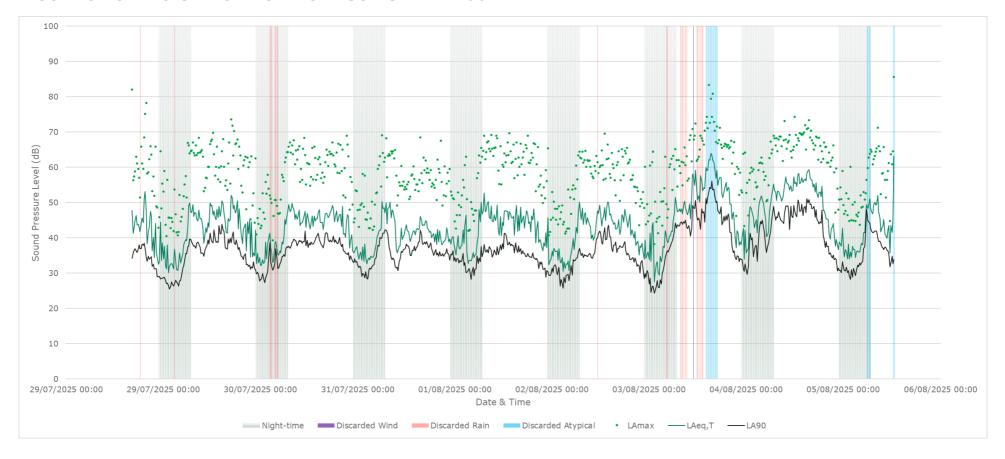


^a Façade levels levels (the measurement or calculation of sound levels at a specific distance in front of a building's façade). A of 3 dB is applied to account for the sound reflected from the façade.

^b Weekdays 07:00-19:00 and Saturday 07:00-13:00.

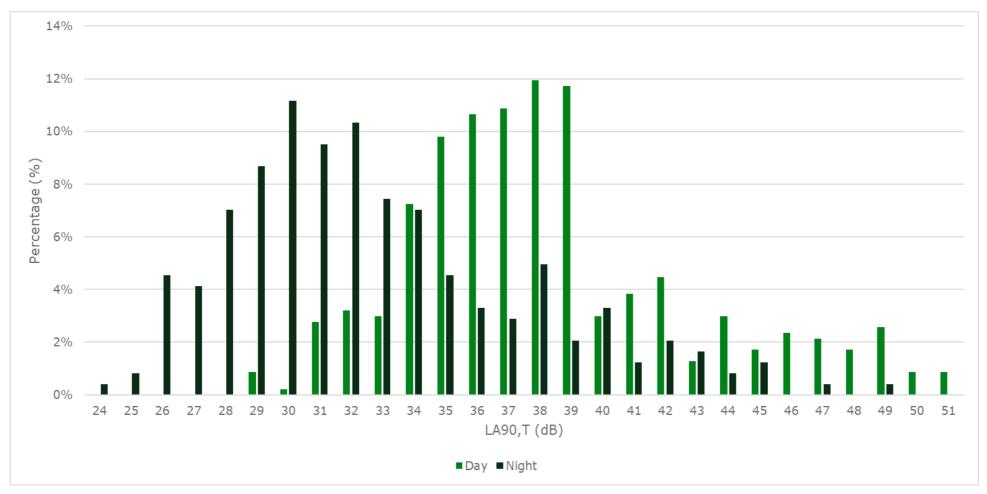
^c Weekdays, 19:00–23:00, Saturdays 13:00-23:00, and Sundays 07:00-23:00.

FIGURE 9.18 - NOISE MONITORING RESULTS AT NML06



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FIGURE 9.19 - DISTRIBUTION OF BACKGROUND SOUND LEVELS DURING THE DAY (07:00-23:00) AND NIGHT (23:00-07:00) AT NML06







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