Technical Note: Hopewell Street, Barnsley

Project	**Barnsley BESS, Hopewell Street, Barnsley**		
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1 Introduction

1.1 This technical note has been prepared by BWB Consulting Ltd to discharge a planning condition on a development at land west of Hopewell Street, Barnsley (the Site) following compliance testing in July 2023.

1.2 BWB have previously provided a detailed noise impact assessment[1] (NIA) to support a Section 73 amendment (reference: '*2022/0801*') to the approved planning application (reference: '*2017/1306*') for a new 40MW Battery Energy Storage System (BESS) site. The results of this assessment showed that mitigation measures would be required in the form of acoustic barriers and attenuation applied to the equipment.

1.3 This technical note has been produced in relation to a noise related planning condition (reference: '*2022/0801*'). Planning condition 9, within the Decision Notice, states:

> *"Within 6 months of the site becoming fully operational a noise assessment shall be carried out by a suitably qualified acoustic consultant/engineer and follow the principles contained in BS 4142:2014 Methods for rating and assessing industrial and commercial sound. Noise from the development, shall not exceed typical background levels at the closest receptors after accounting for any acoustic feature corrections. The results of this assessment shall be submitted to and approved in writing by the Local Planning Authority. Any mitigation measures recommended in the report to achieve the level stated above, shall be agreed with the Local Planning Authority implemented as soon as practicable."*

1.4 Monitoring was previously undertaken in June 2023, when the equipment was installed and in operation but the acoustic barriers were only partially installed. Further monitoring has been undertaken once the mitigation measures have been fully installed; the results of these additional measurements are presented in this technical note.

1.5 **Figure 1.1** illustrates the extent of the installed acoustic barriers. It should be noted that the location of the acoustic barriers in the south-west of the Site has been amended from the proposed mitigation illustrated in Figure 6.1 of the original NIA due to fire safety issues. These barriers are now to be installed south of the grid substation.

[1] BWB Consulting Limited (August 2021) Barnsley BESS, Noise Impact Assessment. (Reference: BIM-BWB-ZZ-ZZ-RP-LA-0001_NIA_S0_P01).

Technical Note: Hopewell Street, Barnsley

Figure 1.1: Acoustic Barrier Mitigation Extents Installed

1.6 This technical note should be read in conjunction with the NIA submitted in support of the planning application (reference: '*MCA2155-002, dated August 2021*').

Technical Note: Hopewell Street, Barnsley

2 Noise Measurements

Background

2.1 BWB have previously undertaken a baseline noise survey in 2021. This comprised unattended monitoring between 24th February 2021 and 25th February 2021 at two locations within the wider site that were representative of the nearest noise sensitive receptors (NSRs). A summary of the results of this monitoring is presented in **Table 2.1**.

Table 2.1: Summary of Baseline Noise Survey Results, 24-hour Monitoring

ML	Period	Duration	dB $L_{Aeq,T}$[1]	dB L_{AFmax} [3]	dB $L_{A90,T}$[2]
1	Daytime (07:00 – 23:00)	16-hours	48	-	43
	Night-time (23:00 – 07:00)	8-hours	42	57	37
2	Daytime (07:00 – 23:00)	16-hours	57	-	44
	Night-time (23:00 – 07:00)	8-hours	52	67	35

[1] Logarithmic average sound pressure levels during measurement period

[2] Arithmetic average $L_{A90,15mins}$ during the night-time and $L_{A90,1h}$ during the daytime, sound pressure level during measurement period

[3] 10th Highest L_{AFmax} during the measurement period

2.2 A previous baseline noise survey was undertaken by ENS Consultants in 2016. Whilst this data has been used in previous assessments, the more recent data from 2021 will be considered in this report.

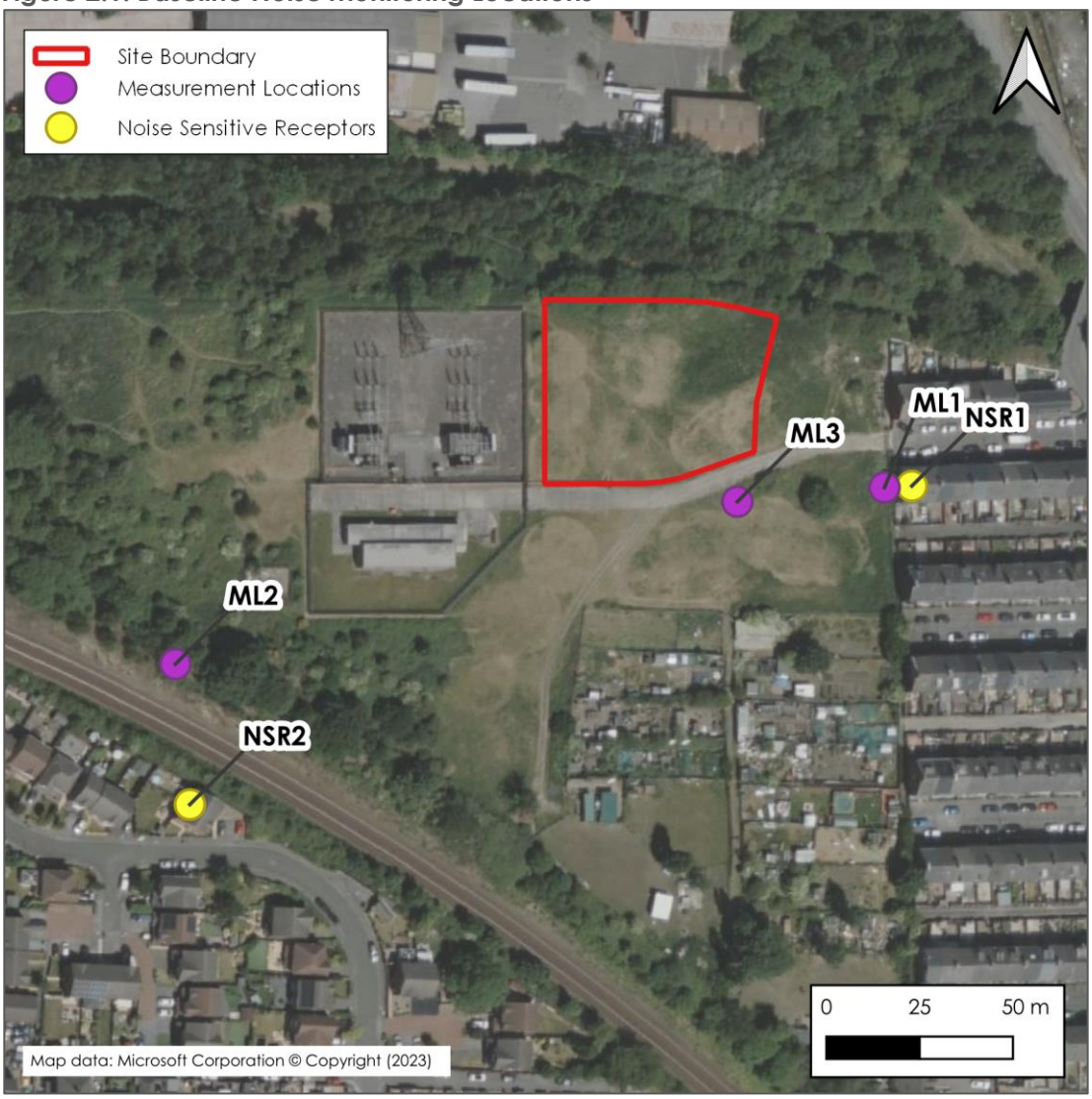
Noise Monitoring Locations

2.3 Subsequent noise surveys have been undertaken to determine the current noise conditions at the closest NSRs following the installation of equipment and mitigation measures on the development Site. The most recent survey in July 2023, as considered in this technical note, was undertaken following the full installation of the operating plant equipment and mitigation measures fully implemented on-site.

2.4 The 24-hour measurement locations (MLs) are shown in **Figure 2.1**. These were in similar locations to the monitoring locations used in February 2021. An additional monitoring location in the immediate vicinity of the Site has also been included in the latest monitoring, to better understand the noise contribution from the Site in relation to the background noise levels at the receptors. All noise levels were measured at a height of 1.5m above local ground level and in free-field conditions.

Technical Note: Hopewell Street, Barnsley

Figure 2.1: Baseline Noise Monitoring Locations



ML1

2.5 Unattended noise measurements were undertaken at ML1. Measurements were undertaken between 12:05 hours on 21st July 2023 and 14:30 hours on 25th July 2023.

2.6 On-site observations during attendance included that road traffic was intermittently audible.

ML2

2.7 Unattended noise measurements were undertaken at ML2. Measurements were undertaken between 11:50 hours on 21st July 2023 and 14:35 hours on 25th July 2023.

2.8 On-site observations during attendance were that noise from train pass-bys on the adjacent railway line was dominant at the measurement location and that secondary

Technical Note: Hopewell Street, Barnsley

noise sources included natural sounds, such as birdsong were perceptible. Whilst the development was audible in other areas of the Site, it was not audible at the measurement location.

ML3

2.9 Unattended noise measurements were undertaken at ML3. Measurements were undertaken between 12:15 hours on 21st July 2023 and 14:45 hours on 25th July 2023.

2.10 On-site observations during attendance included there were no specific noise sources that were dominant on the site. It was noted that there was some distant road noise, natural sounds and minor plant hum in the background from the battery storage.

Measurement Equipment

2.11 The survey was undertaken using the Class 1 specification noise measurement equipment detailed in **Table 2.2**. Measurement equipment was calibrated using a portable calibrator immediately before and after the measurements with no significant drift in calibration observed.

Table 2.2: Noise Measurement Equipment

ML	Equipment	Make & Model	Serial Number	Calibration Due Date
1	Sound Level Meter	01dB Fusion	14147	October 2023
	Microphone	GRAS 40CD	466821	
2	Sound Level Meter	01dB Fusion	12079	April 2025
	Microphone	GRAS 40CD	367009	
3	Sound Level Meter	01dB Fusion	14939	January 2025
	Microphone	GRAS 40CD	504890	
Calibrator		01dB CIRRUS	98098	December 2024

Meteorological Conditions

2.12 Weather conditions mostly remained conducive for noise measurements throughout the survey, it being dry with negligible winds (<5ms^{-1}). Periods of adverse weather conditions, with notable precipitation and wind conditions, were excluded from the survey results and assessment.

Noise Survey Results

2.13 A summary of the noise survey results is provided below in **Table 2.3** to **Table 2.5**.

Table 2.3: Noise Survey Results at ML1, 24-hour Monitoring

Date	Period	Duration	dB $L_{Aeq,T}$[1]	dB L_{Afmax} [3]	dB $L_{A90,T}$[2]
21.07.23	Daytime (13:00 – 23:00)[4]	10-hours	47	-	42
	Night-time (23:00 – 07:00)	8-hours	42	56	38
22.07.23	Daytime (07:00 – 23:00)	16-hours	43	-	39

Technical Note: Hopewell Street, Barnsley

Date	Period	Duration	dB $L_{Aeq,T}$[1]	dB L_{Afmax} [3]	dB $L_{A90,T}$[2]
	Night-time (23:00 – 07:00)	8-hours	42	55	37
23.07.23	Daytime (07:00 – 23:00)	16-hours	44	-	41
	Night-time (23:00 – 07:00)	8-hours	45	56	42
24.07.23	Daytime (07:00 – 23:00)	16-hours	44	-	40
	Night-time (23:00 – 07:00)	8-hours	42	54	38
25.07.23	Daytime (07:00 – 13:00)[4]	7-hours	45	-	41

[1] Logarithmic average sound pressure levels during measurement period

[2] Arithmetic average $L_{A90,15mins}$ during the night-time and $L_{A90,1h}$ during the daytime, sound pressure level during measurement period

[3] 10th Highest L_{AFmax} during the measurement period

[4] Data from first and last days of monitoring are not full days

Table 2.4: Noise Survey Results at ML2, 24-hour Monitoring

Date	Period	Duration	dB $L_{Aeq,T}$[1]	dB L_{Afmax} [3]	dB $L_{A90,T}$[2]
21.07.23	Daytime (12:00 – 23:00)[4]	11-hours	56	-	43
	Night-time (23:00 – 07:00)	8-hours	51	68	45
22.07.23	Daytime (07:00 – 23:00)	16-hours	45	-	42
	Night-time (23:00 – 07:00)	8-hours	53	68	49
23.07.23	Daytime (07:00 – 23:00)	16-hours	57	-	47
	Night-time (23:00 – 07:00)	8-hours	55	76	47
24.07.23	Daytime (07:00 – 23:00)	16-hours	56	-	42
	Night-time (23:00 – 07:00)	8-hours	51	78	40
25.07.23	Daytime (07:00 – 13:00)[4]	7-hours	56	-	42

[1] Logarithmic average sound pressure levels during measurement period

[2] Arithmetic average $L_{A90,15mins}$ during the night-time and $L_{A90,1h}$ during the daytime, sound pressure level during measurement period

[3] 10th Highest L_{AFmax} during the measurement period

[4] Data from first and last days of monitoring are not full days

Table 2.5: Noise Survey Results at ML3, 24-hour Monitoring

Date	Period	Duration	dB $L_{Aeq,T}$[1]	dB L_{Afmax} [3]	dB $L_{A90,T}$[2]
21.07.23	Daytime (13:00 – 23:00)[4]	10-hours	48	-	41
	Night-time (23:00 – 07:00)	8-hours	43	56	39
22.07.23	Daytime (07:00 – 23:00)	16-hours	45	-	42
	Night-time (23:00 – 07:00)	8-hours	44	55	40

Technical Note: Hopewell Street, Barnsley

Date	Period	Duration	dB $L_{Aeq,T}$[1]	dB L_{Afmax} [3]	dB $L_{A90,T}$[2]
23.07.23	Daytime (07:00 – 23:00)	16-hours	44	-	40
	Night-time (23:00 – 07:00)	8-hours	44	55	41
24.07.23	Daytime (07:00 – 23:00)	16-hours	50	-	40
	Night-time (23:00 – 07:00)	8-hours	43	55	39
25.07.23	Daytime (07:00 – 13:00)[4]	7-hours	46	-	40

[1] Logarithmic average sound pressure levels during measurement period

[2] Arithmetic average $L_{A90,15mins}$ during the night-time and $L_{A90,1h}$ during the daytime, sound pressure level during measurement period

[3] 10th Highest L_{AFmax} during the measurement period

[4] Data from first and last days of monitoring are not full days

Technical Note: Hopewell Street, Barnsley

3 Updated Noise Assessment

3.1 As detailed within the previous reporting, the predicted noise from the BESS site was modelled to have the potential for significant adverse impacts at the NSRs. As such, as part of the assessment works undertaken to support the planning application, multiple mitigation scenarios were trialled to reduce the noise level at both NSRs. The results detailed in the NIA indicated that with the proposed mitigation in place, noise associated with the BESS will be in line with typical background levels at the NSRs.

3.2 The mitigation measures were fully installed at the time of monitoring in July 2023. As noted in **Section 1**, the location of acoustic barriers in the south-west of the Site has been amended following the NIA due to fire safety issues.

3.3 Following the full installation of the mitigation measures, an updated baseline noise survey was undertaken, the results of which are summarised in **Table 2.3**, **Table 2.4** and **Table 2.5**. The results presented in **Section 2** are considered to have contributions from other environmental noise sources, such as road traffic or train pass-bys. To gain an understanding of the noise levels at the NSRs, a distance correction has been applied to the measurements from ML3 to provide indicative noise levels from the Site at the receptors.

3.4 The assessment has considered data from 21st July 2023 and 22nd July 2023 to capture weekday and weekend periods. **Table 3.1** and **Table 3.2** summarise assessment, in accordance with BS 4142, for daytime and night-time periods respectively. No acoustic corrections have been applied, in line with previous assessment. No tonal properties were noted to be associated with the equipment whilst on-site.

3.5 The background sound levels used in this assessment are from the baseline noise monitoring undertaken in 2021.

Table 3.1: BS 4142 Assessment of operational use at NSR 1&2, Daytime with Mitigation

Description	Daytime Sound Levels (dB) at NSR 1		Daytime Sound Levels (dB) at NSR 2		Relevant BS 4142 Clause
	Weekday	Weekend	Weekday	Weekend	
Specific sound level	40 $L_{Aeq,1hour}$	37 $L_{Aeq,1hour}$	33 $L_{Aeq,1hour}$	30 $L_{Aeq,1hour}$	7.3.5
Acoustic feature correction	0	0	0	0	9.2
Rating level	40 $L_{Aeq,1hour}$	37 $L_{Aeq,1hour}$	33 $L_{Aeq,1hour}$	30 $L_{Aeq,1hour}$	9.2
Background sound level	43 $L_{A90,1hour}$[1]	43 $L_{A90,1hour}$[1]	44 $L_{A90,1hour}$[1]	44 $L_{A90,1hour}$[1]	8
Excess over background	-3	-6	-11	-14	-
BS 4142 impact	**Low impact**	**Low impact**	**Low impact**	**Low impact**	-
Commentary	[1]based on the typical $L_{A90,1hr}$ level during the daytime period				

Technical Note: Hopewell Street, Barnsley

Table 3.2: BS 4142 Assessment of operational use at NSR 1&2, Night-time with Mitigation

Description	Night-time Sound Levels (dB) at NSR 1		Night-time Sound Levels (dB) at NSR 2		Relevant BS 4142 Clause
	Weekday	Weekend	Weekday	Weekend	
Specific sound level	35 $L_{Aeq,15mins}$	36 $L_{Aeq,15mins}$	28 $L_{Aeq,15mins}$	29 $L_{Aeq,15mins}$	7.3.5
Acoustic feature correction	0	0	0	0	9.2
Rating level	35 $L_{Ar,15mins}$	36 $L_{Ar,15mins}$	28 $L_{Aeq,15mins}$	29 $L_{Aeq,15mins}$	9.2
Background sound level	37 $L_{A90,15minsr}$[1]	37 $L_{A90,15mins}$[1]	35 $L_{A90,15mins}$[1]	35 $L_{A90,15mins}$[1]	8
Excess over background	-2	-1	-7	-6	-
BS 4142 impact	**Low impact**	**Low impact**	**Low impact**	**Low impact**	-
Commentary	[1]based on the typical $L_{A90,15mins}$ level during the night-time period				

3.6 The assessment indicates that with the equipment and mitigation measures in place, the BESS site does not result in noise levels at the nearest receptors greater than the background levels. It is therefore considered that no further mitigation is required.

Technical Note: Hopewell Street, Barnsley

4 Summary

4.1 A baseline noise survey was undertaken following the installation of the equipment and proposed acoustic barriers at the BESS site west of Hopewell Street, Barnsley.

4.2 Previous assessment showed that with consideration to the proposed noise mitigation measures, the requirements of the noise related planning condition should be achieved.

4.3 Following the full installation of the equipment and mitigation measures, the results of the survey and assessment indicate that the noise from the Site is in line with the criteria outlined within planning condition 9 for the planning application (reference: '*2022/0801*'). No further mitigation is considered to be required to satisfy this condition and it is considered that the condition can be discharged.