

Noise Assessment for:
Proposed Battery Energy Storage Facility

Land at
Mitchells Industrial Park, Bradberry Balk Lane, Wombwell, Barnsley, S73 8HR

Prepared By
Mercia Power Response



Report Reference: Noise Assessment - Mitchells Battery

02 July 2025

SITE ADDRESS:

Land at Mitchells Industrial Park,
Bradberry Balk Lane,
Wombwell,
Barnsley,
S73 8HR

DATE ISSUED:

02/07/2025

REPORT REFERENCE:

Noise Assessment - Mitchells Battery

REPORT PREPARED BY:

Mercia Power Response (MPR)

APPROVED AND AUTHORISED FOR SUBMISSION BY

Peter Ford
Mercia Power Response
Strelley Hall,
Main Street,
Nottingham,
NG8 6PE

This document has been prepared by Mercia Power Response Ltd with all reasonable skill, care and diligence. Mercia Power Response Ltd accepts no responsibility of whatever nature to third parties to whom this report may be made known. No part of this document may be reproduced without the prior written approval of Mercia Power Response.

TABLE OF CONTENTS

Table of CONTENTS.....	ii
1 Introduction	1
1.1 General.....	1
1.2 The Site description and proposed development.....	1
2 Standards and guidance	2
3 Background levels.....	3
3.2 Background Noise Monitoring Survey Results.....	6
4 Noise Modelling.....	6
4.2 Modelling Assumptions - Noise levels	7
5 Noise Impact Assessment	8
5.2 Assessment Locations.....	9
5.3 BS 4142 Assessment Results.....	10
6 Conclusion.....	12
Appendix 1: Full noise modelling output	14

LIST OF TABLES:

Table 1: Weekday Monitoring Survey.....	4
Table 2: Weekend Monitoring Survey.....	4
Table 3: Noise Monitoring Equipment.....	5
Table 4: Measured Background Noise Level Data - Weekday	6
Table 5: Measured Background Noise Level Data - Weekend	6
Table 6: Operational Equipment Noise Data	7
Table 7: BS 4142 Character Corrections.....	8
Table 8: Morning Period: Between 8.30 – 9.30am.....	10
Table 9: Daytime Period: Between 11am – 9pm	10
Table 10: Evening Period: Between 9pm and 11pm.....	11
Table 11: Night-time Period: Between 12pm and 4am	11

LIST OF FIGURES:

Figure 1: Background noise monitoring location ML1	4
Figure 2: Grid Noise Map, all noise sources at full noise output (2m grid height).....	9

1 INTRODUCTION

1.1 General

- 1.1.1 The Applicant, Mercia Power Response (MPR), is proposing to install and operate a battery energy storage facility at Mitchells Industrial Park, Bradberry Balk Lane, Wombwell, Barnsley, S73 8HR. Hereafter referred to as the 'proposed development'.
- 1.1.2 Mercia Power Response has undertaken this Noise Assessment in relation to the proposed development. The latest plans submitted as part of the planning application shows the layout and location of the Site (MPR-MIBP-001. V4 and MPR-MIBP-002).
- 1.1.3 The potential noise impact from the sources identified is calculated and rated according to the BS 4142 methodology for the residential receptors.
- 1.1.4 A Background Noise monitoring survey was carried out at one location on Sunday 11th, Monday 12th and Tuesday 13th May 2025.

1.2 The Site description and proposed development

Site details

- 1.2.1 The proposed development 'Site' is located within an existing open industrial yard, now vacant, but previously used for storage of timber products and vehicles.
- 1.2.2 For identification purposes, the application Site is centred on OS Grid Reference SE 39183 0418.
- 1.2.3 The nearest residential properties to the application Site are located a distance of 135m from the application Site boundary to the west and southwest on the A633 Barnsley Road.
- 1.2.4 Industrial premises lie surrounding the Site to the east, west and south on the existing industrial estate. An existing gas fuelled power generation facility lies immediately to the south of the application Site.

Proposed Development

- 1.2.5 The Applicant is proposing to install and operate a Battery Energy Storage Facility comprising 13 no. battery storage units, 8 no. electrical transformers, electrical substation compound equipment and other associated ancillary equipment.
- 1.2.6 Battery storage facilities now play a vital role in maintaining energy security and grid stability which prevents events such as power surges and outages, both of which are very damaging to electrical infrastructure. Without such infrastructure power supply becomes unreliable.
- 1.2.7 Due to the important role the facility will serve in providing services to stabilise the national electrical grid network, the facility must be available for operations at all times of the day and night.

- 1.2.8 However, it must be stressed that the noise assessment provided in this document represents the 'worst case'. For example, the maximum noise outputs from the battery equipment are closely associated with ambient air temperatures. Warmer ambient air temperatures require more cooling of the batteries from the integrated fan equipment which results in greater noise emissions.
- 1.2.9 The figures presented in this assessment are 'worst case' and typically would only be experienced in circa 30 degrees Celsius ambient air temperatures. It should be noted that it has only reached above 25 degrees Celsius overnight anywhere in the UK on one single occasion. This was during the heatwave on 19th July 2022. At lower ambient air temperatures than 30 degrees Celsius the noise emissions would be lower than presented in this report.

2 STANDARDS AND GUIDANCE

National Planning Policy Framework (NPPF, July 2021)

- 2.1.1 The National Planning Policy Framework determines the government's planning policy for England. The NPPF states that, with respect to noise, planning policies and decisions should aim to:
- Avoid Noise from giving rise to significant adverse impacts on health and quality of life as a result of new development;
 - Mitigate and reduce to a minimum other adverse impacts on health and quality of life arising from noise from a new development, including through the use of conditions;
 - Recognise that development will often create some noise and existing business wanting to develop in continuance of their business should not have unreasonable restrictions put upon them because of changes in nearby land uses since they were established; and
 - Identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.
 - The guidance contained within the NPPF further determines that consideration should be given to the

BS 4142

- 2.1.2 BS 4142 describes a method of determining the level of noise of an industrial nature, together with the procedures for assessing whether the noise in question is likely to give rise to complaints from persons living in the vicinity.
- 2.1.3 The Standard is based around the premise that the significance of the impact of an industrial/ commercial facility can be derived from the numerical

subtraction of the background noise climate level (not necessarily the lowest background level measured, but the typical background of the receptor) from the measured/calculated rating level of the specific sound under consideration. This comparison will enable the impact of said sound to be concluded based upon the premise that typically *"the greater this difference, the greater the magnitude of the impact"*.

BS 4142 states that:

- A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.
- A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.
- The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.

3 BACKGROUND LEVELS

3.1.1 In order to more accurately determine the noise climate in the vicinity of the nearest residential properties, an attended monitoring survey was undertaken at one location. The single location was selected so as to be a representative of the closest existing residential receptors to the proposed battery energy storage facility (see paragraph 5.2 for details).

3.1.2 The noise survey was undertaken during key periods on:

- Sunday 11th into Monday 12th May, a typical operational weekend period.
- Monday 12th into Tuesday 13th May, a typical operational weekday

Background noise monitoring locations

3.1.3 The single monitoring location is as described below as follows and as detailed within Figure 1 below.

- ML 1 – Adjacent to the nearest residential properties at an approximate microphone height of 1.5m above local ground level

3.1.4 The location was considered to be appropriate due to the nature of the nearby sensitive receptors being generally in this area/direction or further towards the A633 Road where greater traffic noise would be expected.



Figure 1: Background noise monitoring location ML1
(Source Google Maps)

3.1.5 For reference, the monitoring survey was undertaken during the following periods as detailed below and in Table 1 and Table 2:

Table 1: Weekday Monitoring Survey		
Monitoring Location	Reference period	
	ML 1	Start
End		Tuesday - 13/05/2025 - 06:55

Table 2: Weekend Monitoring Survey		
Monitoring Location	Reference period	
	ML 1	Start
End		Monday - 12/05/2025 - 06:55

3.1.6 For the purposes of this assessment, we will be presenting data from the following 1hr periods.

- Morning: 8.30am and 9.30am
- Day: 1pm – 2pm

- Evening: 7pm and 8pm
- Night: 1am and 1.30am

Weather

3.1.7 As the survey was undertaken on an attended basis, details of the prevailing weather conditions were noted throughout the surveys.

- Dry with an ambient temperatures of approximately 15°C daytime to evening, with 13°C through the night.
- Cloud cover was 0% for all monitoring periods.
- Wind speeds were measured to be low (<5ms-1) and north east direction for all monitoring periods
- It is further noted that ground conditions were dry for the duration surveys with no precipitation falling immediately prior to, or during any of the survey periods. Road surfaces were dry.
- It was noted that noise was influenced by road traffic from the nearby roads, birdsong, a carwash and noise from the industrial estate.

Monitoring Equipment

3.1.8 The monitoring of noise was undertaken in line with the guidance set out within BS7445: 2003. The equipment used was set to record the following statistical parameters:

- LAeq in dB
- LA10 in dB
- LA90 in dB
- LAmax in dB

3.1.9 The following noise monitoring equipment was used in order to undertake the survey work in the vicinity of the Site.

Table 3: Noise Monitoring Equipment				
Equipment	Manufacturer	Type	Serial Number	Calibration Due Date
Sound Level Meter	01dB	Solo	65446	24 November 2026
Calibrator	Cirrus	CR-515	67243	31st January 2026

3.1.10 The following set-up parameters were used on the sound level meters during all of the noise measurements undertaken:

- Time Weighting: Fast.
 - Frequency Weighting: “A”.
- 3.1.11 The sound level meters used within this assessment were locally calibrated using an electronic calibrator (c.f. Table 3-2) prior to commencement and upon completion of each survey, no significant drift in calibration was observed.
- 3.1.12 The formal external calibration documentation for the equipment used can be provided upon request.

3.2 Background Noise Monitoring Survey Results

- 3.2.1 Presented within Table 4 and Table 5 below is a summary of the noise levels monitored at the location, which was detailed within Figure 1 previously.

Table 4: Measured Background Noise Level Data - Weekday						
Location	Period	L _{Aeq, T}	L _{min, T}	L _{max, T}	L _{A90, T}	L _{A10, T}
ML 1	Morning	60.8	45.2	80.0	53.9	63.5
	Daytime	58.7	45.2	71.2	51.5	61.7
	Evening	58.3	40.5	74.2	47.5	61.9
	Night-time	49.7	27.1	68.9	29.6	51.9

Table 5: Measured Background Noise Level Data - Weekend						
Location	Period	L _{Aeq, T}	L _{min, T}	L _{max, T}	L _{A90, T}	L _{A10, T}
ML 1	Morning	61.7	45.0	77.7	53.4	65.0
	Daytime	58.9	42.3	73.8	50.5	61.2
	Evening	57.9	39.1	76.5	45.6	61.8
	Night-time	49.5	27.7	66.0	30.1	52.9

- 3.2.2 The L_{A90, T} values will be used at the background noise levels within the scope of the BS4142 Assessment undertaken.

4 NOISE MODELLING

- 4.1.1 The noise model was constructed within the commercially available computer noise mapping tool iNoise 2024.
- 4.1.2 Within the scope of this modelling exercise, acoustic propagation has been calculated in accordance with the following standards:
- Recommendations for quality assured implementation of ISO 9613-2 in software according to ISO 17534-3, 2015.

Foundation of the Model

- 4.1.3 The noise model was constructed utilising the following information:

- Scaled Google Earth aerial photography to provide details of surrounding buildings.
- Site layout plan as detailed within drawings ref: MPR-MIBP-001.V4.
- Battery storage unit and transformer noise data provided by the manufacturer.
- Mixed ground between the noise source and receiver locations ($G = 0.5$).
- Ambient air temperature of 20 degrees C
- Humidity 60%
- Barriers and screening influence in calculated in accordance with ISO9613.
- Calculation height = 2 meter
- Topographical terrain data using a 1m resolution LiDAR.

4.2 Modelling Assumptions - Noise levels

- 4.2.1 Noise levels associated with the key items of plant as detailed within Table 6.

Table 6: Operational Equipment Noise Data			
Plant	Number of units	Description	Noise Data Sound pressure level (SPL) per unit
Battery storage unit	13	Batteries and cooling ventilation system housed within specifically designed acoustic containers	54.0 dBA @10m
Electrical transformers	8	Electrical transformers	47.0 dBA @10m
Ancillary equipment	various	Switchroom, kiosk, etc	No noise emissions

Please note – We have been informed by the manufacturer that the above noise levels for the battery unit represent the ‘worst case scenario’ for a UK climate and would typically only occur when ambient air temperatures in the region of 30 degrees Celsius. Typical/average noise levels would therefore be lower than the above figures.

Character Corrections

- 4.2.2 Within the methodology of BS 4142 it is necessary to calculate a specific external noise level at each receptor location from the operations/Site under

consideration. This specific noise level then requires converting to a “Rating” level in order to take account of any tonal or noticeable characteristics of the source noise. It is noted that as is required by BS 4142 the assessment is undertaken on the basis of whole dB values with 0.5dB being rounded up.

- 4.2.3 The following has been concluded with regard to suitable character corrections for the operations under consideration.

Table 7: BS 4142 Character Corrections			
Characteristic	Subjective Perception	Justification	BS 4142 correction
Tonality	Just	The noise generated by battery storage units may have capacity to generate some small degree of tonal component. However, given the separation distance between the Site and closest Receptors (135m), it is considered that this would not be very significant in this case.	+2
Impulsivity	None	Noise generated by the battery Site is not considered to be impulsive.	+0
Other characteristics	None	No ‘other’ characteristics associated with the battery Site are considered to be present.	+0
Intermittency	Possible	Once the battery Site is running it is at a constant output level. However, the facility would not operate constantly and only periodically as required. Whilst potentially there could be some level of intermittency associated with the facility this would not be clearly identifiable	+0
Total Character correction			+2

5 NOISE IMPACT ASSESSMENT

- 5.1.1 The noise contour plot presented in Figure 2 details the output of the noise model constructed to predict noise from the operation of the facility.
(A full output is presented in Appendix 1)

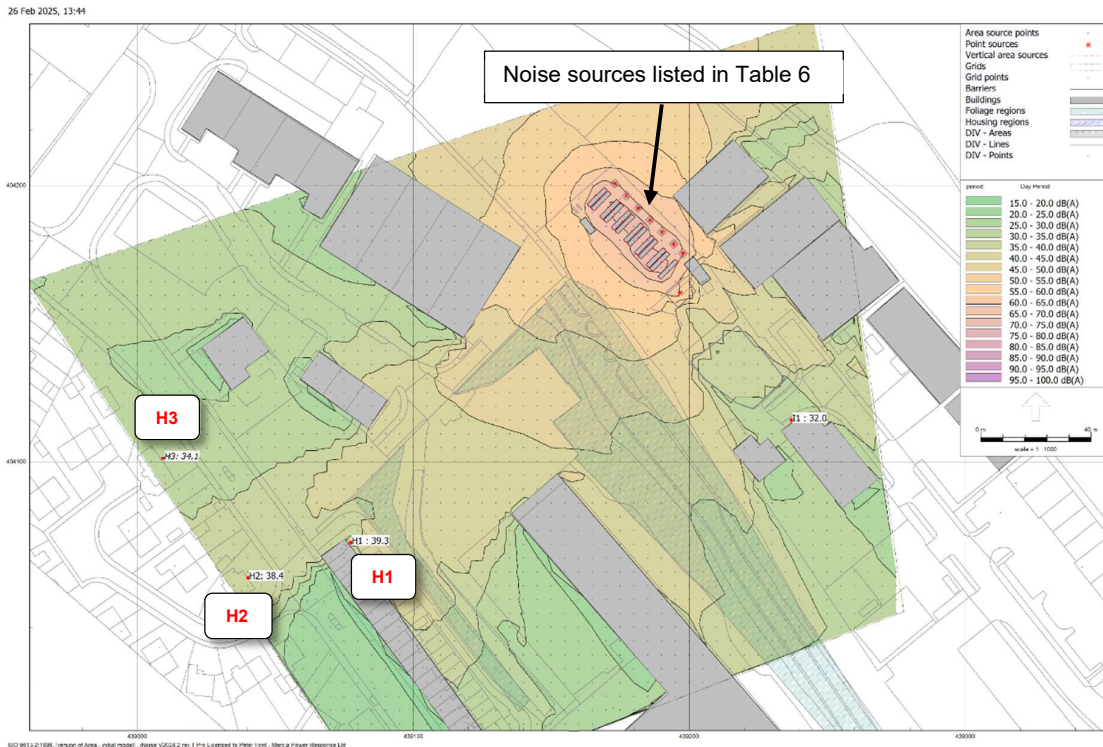


Figure 2: Grid Noise Map, all noise sources at full noise output (2m grid height)
Aerial image source Google Maps

5.2 Assessment Locations

5.2.1 3 No. residential noise receptors have been modelled (as per Figure 2 above). These locations represent the closest sensitive receptors to the proposed development.

- H1 – Residential property on Barnsley Road. Approx. 150m to the battery units
- H2 – Residential property on Barnsley Road. Approx. 180m to the battery units
- H3 – Residential property on Barnsley Road. Approx. 180m to the battery units

5.3 BS 4142 Assessment Results

Morning Operational Assessment

Table 8: Morning Period: Between 8.30 – 9.30am				
Assessment Location	L _{A90} , 'Background' noise Levels, (dB)	Maximum Predicted BS 4142 Specific Noise Level ¹ , (dB)	Corrected BS4142 Rating Level ¹ , (dB)	Difference (Rating V Background) ¹ , (dB)
H1	53.9	39	41	-13
H2	53.9	38	40	-14
H3	53.9	34	36	-18

¹ Note: Noise levels rounded to nearest whole dB in accordance with the guidance of BS 4142

5.3.1 It can be seen from the table above that the BS 4142 assessment indicates noise arising from operation of the facility during the daytime period would be rated by the Standard as being:

- Between -13 dB and -18 dB below the existing estimated background noise climate of the area, depending upon assessment location. This would therefore be considered an acceptable impact and under the BS 4142 Standard as being an 'Indication of the specific sound source having a low impact'

Daytime Operational Assessment

Table 9: Daytime Period: Between 11am – 9pm				
Assessment Location	L _{A90} , 'Background' noise Levels, (dB)	Maximum Predicted BS 4142 Specific Noise Level ¹ , (dB)	Corrected BS4142 Rating Level ¹ , (dB)	Difference (Rating V Background) ¹ , (dB)
H1	51.5	39	41	-10
H2	51.5	38	40	-11
H3	51.5	34	36	-15

¹ Note: Noise levels rounded to nearest whole dB in accordance with the guidance of BS 4142

5.3.2 It can be seen from the table above that the BS 4142 assessment indicates noise arising from operation of the facility during the daytime period would be rated by the Standard as being:

- Between -10 dB and -15 dB below the existing estimated background noise climate of the area, depending upon assessment location. This would therefore be considered an acceptable impact and under the BS 4142 Standard as being an

'Indication of the specific sound source having a low impact'

Evening Operational Assessment

Table 10: Evening Period: Between 9pm and 11pm				
Assessment Location	L _{A90} , 'Background' noise Levels, (dB)	Maximum Predicted BS 4142 Specific Noise Level ¹ , (dB)	Corrected BS4142 Rating Level ¹ , (dB)	Difference (Rating V Background) ¹ , (dB)
H1	47.5	39	41	-6
H2	47.5	38	40	-7
H3	47.5	34	36	-11

¹ Note: Noise levels rounded to nearest whole dB in accordance with the guidance of BS 4142

5.3.3 It can be seen from the table above that the BS 4142 assessment indicates noise arising from operation of the facility during the evening period would be rated by the Standard as being:

- Between -6 dB and -11 dB below the existing estimated background noise climate of the area, depending upon assessment location. This would therefore be considered an acceptable impact and under the BS 4142 Standard as being an *'Indication of the specific sound source having a low impact'*

Night-time Operational Assessment

5.3.4 Due to the important role the facility will serve in providing services to stabilise the national electrical grid network, the facility must be available for operations at all times of the day and night. Typically, the batteries undergo charging during this period.

Table 11: Night-time Period: Between 12pm and 4am				
Assessment Location	L _{A90} , 'Background' noise Levels, (dB)	Maximum Predicted BS 4142 Specific Noise Level ¹ , (dB)	Corrected BS4142 Rating Level ¹ , (dB)	Difference (Rating V Background) ¹ , (dB)
H1	29.6	39	41	12
H2	29.6	38	40	11
H3	29.6	34	36	7

¹ Note: Noise levels rounded to nearest whole dB in accordance with the guidance of BS 4142

5.3.5 It can be seen from the table above that the BS 4142 assessment indicates noise arising from operation of the facility during the night-time period would

be rated by the Standard as being:

- Between +7 dB and +12 dB below the existing estimated background noise climate of the area, depending upon assessment location. This would therefore be considered under the BS 4142 Standard as being an *'Indication of the specific sound source indication of a significant adverse impact, depending on the context'*

The following context is important and should be noted in relation to the overnight assessment:

- 5.3.6 It must be stressed that the noise assessment provided represents the 'worst case' scenario. For example, the maximum noise outputs from the battery equipment are closely associated with ambient air temperatures.
- 5.3.7 The noise emissions and therefore impact figures presented would typically only be experienced in circa 30 degrees Celsius ambient air temperatures. It should be noted that it has only reached above 25 degrees Celsius overnight on a single occasion in the UK. At lower ambient air temperatures than 30 degrees Celsius the noise emissions would be lower than presented.
- 5.3.8 BS4142 states "Where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night." A measured background level of 29.6 dB is considered low.

6 CONCLUSION

- 6.1.1 An assessment has been undertaken to consider the potential noise impacts associated with a proposed battery energy storage facility. The Site is located at Mitchells Industrial Park, Bradberry Balk Lane, Wombwell, Barnsley, S73 8HR.
- 6.1.1 In order to determine the noise climate in the vicinity of the nearest residential properties, an attended background noise monitoring survey was undertaken on the Sunday 11th, Monday 12th and Tuesday 13th May 2025.
- 6.1.2 The noise assessment undertaken for the proposed Site that is subject of this assessment indicates that activities associated with the facility during typical morning, daytime and evening periods would be classified by BS 4142 to be at a level considered to provide an *'Indication of the specific sound source having a low impact'*.
- 6.1.3 The 'worst case' overnight assessment provides an *'Indication of the specific sound source indication of an significant adverse impact, depending on the context'*. For overnight impacts, it must be re-iterated that the figures presented in this assessment are 'worst case' and would only be experienced in circa 30 degrees Celsius ambient air temperatures. It should be noted that it has only reached above 25 degrees Celsius overnight on one occasion in the UK. At lower ambient air temperatures than 30 degrees Celsius the noise emissions would be lower than presented.

- 6.1.4 Overall, it is concluded, that based upon the information contained within this report there are unlikely to be any significant issues relating to operational noise associated with the proposed MPR battery energy storage facility that would be sufficient to deny the approval of planning permission on the grounds of noise.

APPENDIX 1: FULL NOISE MODELLING OUTPUT

