Swansea North BESS

EDF Renewables

Noise Assessment

May 2025

Document Control

Job No.	250213	
Project Name	Swansea North BESS	
Document Title	Noise Assessment	
Status	ISSUED	
Client	EDF Renewables	
	Name	Date
Prepared By	Trevor Olver	May 2025
Checked By	Alicia Druce	May 2025
Approved By	Trevor Olver	May 2025

Record of Revisions

Revision	Date	Details	Made By
2	**15/05/2025**	**Updated Site Plan**	**TO**

Rappor Consultants Ltd
A: Pressworks, 7-9 Ambrose Street, Cheltenham, Gloucestershire GL50 3LH
W: www.rappor.co.uk
T: 01242 523696
E: hello@rappor.co.uk

Contents

Document Control i
1 Introduction 3
2 Site Description 4
3 Guidance 7
4 Noise Survey 10
5 Noise Assessment 13
6 Summary and Conclusions 15

List of Figures and Tables

Table 2.1 Nearest Noise-sensitive Receptor 4
Figure 2.1 Site Location 5
Figure 2.2 Site Layout 6
Table 3.1 Impact Assessment 8
Table 3.2 Indoor Noise Levels for Dwellings 9
Figure 4.1 Noise Monitoring Location 10
Table 4.1 Summary of Noise Levels at NML1 11
Figure 4.2 Occurrences of Background Sound Level 12
Table 5.1 Operational Plant 13
Table 5.2 Predicted Operational Noise Levels 13
Table 5.3 BS4142 Assessment 14

Appendices

Appendix A - Acoustic Terminology
Appendix B – Monitoring Equipment

1 Introduction

General

1.1 Rappor Consultants Limited (Rappor) was instructed by EDF Renewables to undertake an operational noise assessment of the proposed Battery Energy Storage System (BESS) facility on land at Abergelli Farm, Felindre ('the Site').

1.2 This report sets out the results of a baseline noise survey at a location representative of the nearest noise-sensitive receptors, predictions of operational noise and assessment in accordance with the guidance contained within BS4142.

1.3 A glossary of acoustic terminology is provided in **Appendix A – Acoustic Terminology**.

2 Site Description

2.1 The development site is located in Felindre, approximately 7km north of Swansea. The development site is located within Abergelli Farm and presently comprises agricultural fields used for pasture.

2.2 The main developable area of the site is split across two parcels which are located to the north and south of a farm track which routes through Abergelli Farm. The site is presently surrounded by agricultural fields on all sides.

2.3 Full planning permission is sought for the installation of a new 250 MW BESS battery storage system facility, with associated infrastructure, engineering works and landscaping (the Proposed Development).

2.4 The closest noise-sensitive receptors to the Site are isolated farm buildings as detailed in **Table 2.1**.

Receptor	Coordinates		Approximate Distance to BESS	Direction
	X	Y		
Abergelli Farm	264980	201510	230m	North-west
Maes-Eglwys	265448	200707	530m	South-east

Table 2.1 Nearest Noise-sensitive Receptor

2.5 The Site location is shown in **Figure 2.1** with a layout presented in **Figure 2.2**.

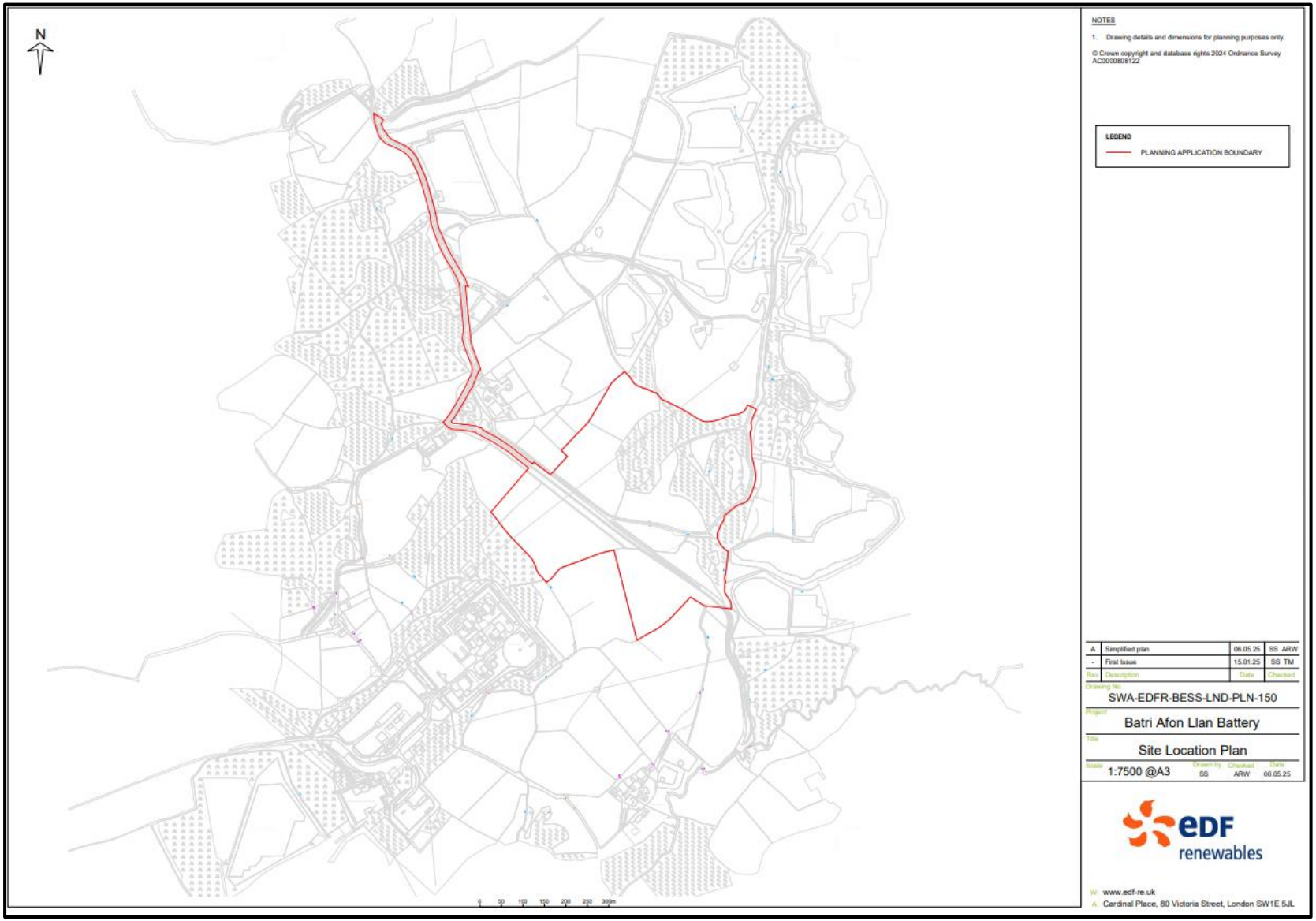

Figure 2.1 Site Location

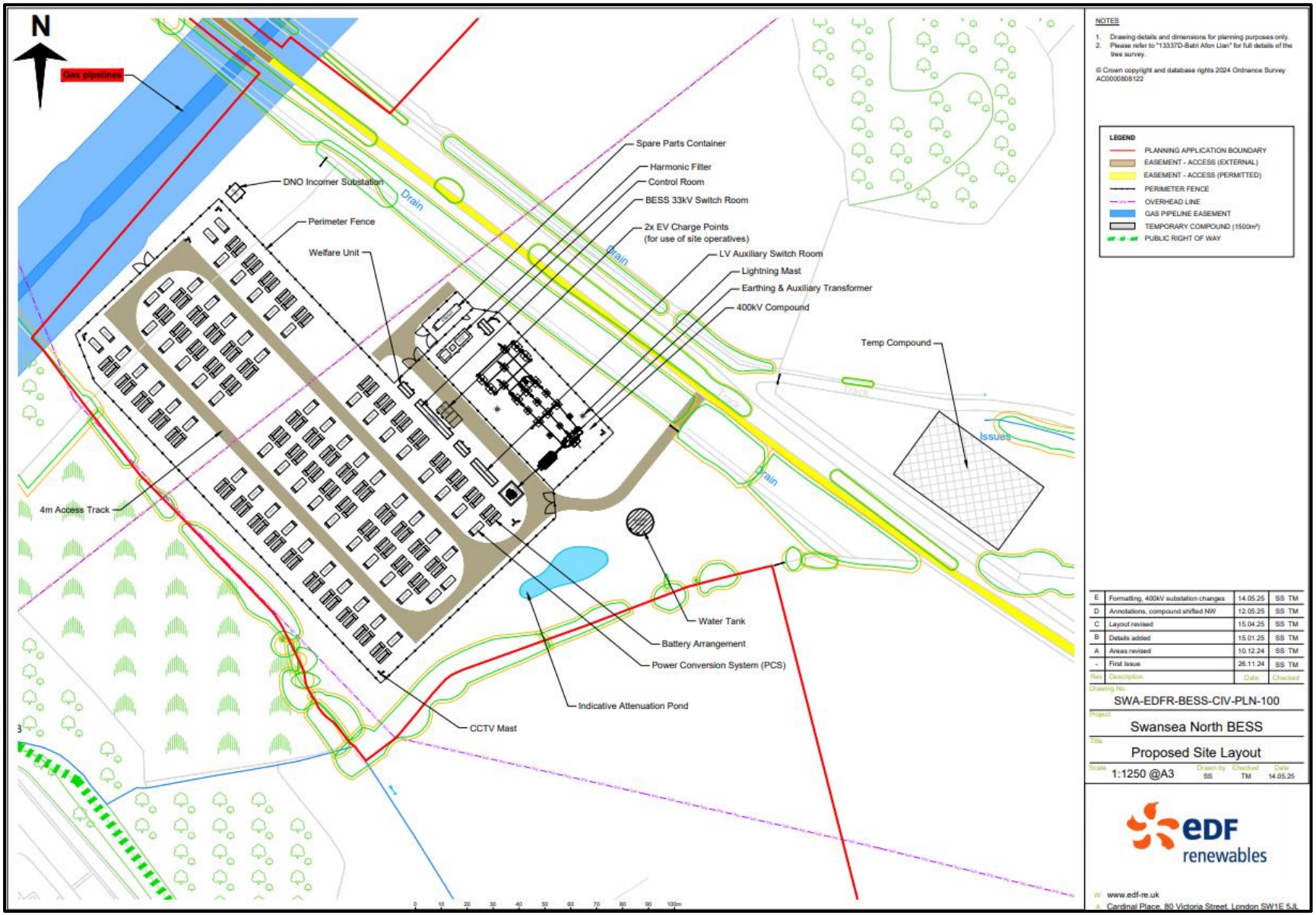

Figure 2.2 Site Layout

3 Guidance

Guidance

3.1 Current government planning advice to Local Authorities in Wales concerning noise takes two forms. General guidance is provided by 'Planning Policy Wales: Edition 12'. This guidance document is then supplemented by 'Technical Advice Note (Wales) 11: Noise' (TAN11). The introduction to TAN11 sets out the importance of appropriately considering noise in planning applications and states how the planning system can be used to:

> *"minimise the adverse impact of noise without placing unreasonable restrictions on development or adding unduly to the costs and administrative burdens of business."*

3.2 Annex B of TAN11 provides guidance on the assessment of environmental noise from different sources. General advice for the assessment of noise from industrial and commercial developments is set out in paragraph B17. Reference is made to the then current BS4142: 1990. This standard has since been superseded with BS4142:2014+A1:2019.

3.3 A summary of the assessment methodology outlined in BS4142:2014+A1:2019 is provided below along with the national strategy on soundscapes.

Noise and Soundscape Plan for Wales 2023-2028

3.4 The national strategy on soundscapes sets out five ways of working that should be followed when carrying out activities that may affect soundscapes in Wales. These are:

a) looking to the long term so that we do not compromise the ability of future generations to meet their own needs;
b) taking an integrated approach;
c) involving a diversity of the population in the decisions affecting them;
d) working with others in a collaborative way to find shared sustainable solutions; and
e) acting to prevent problems from occurring or getting worse.

3.5 Within Annex E – guidance to support decision-making, BS4142 is referenced as a guidance document for the assessment and control of noise in industrial and commercial activities.

British Standard 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound

3.6 BS4142 describes methods for rating and assessing sound of an industrial and/or commercial nature. The method uses outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes.

3.7 The standard requires the determination at the assessment location(s) of the representative background sound level without the specific sound source, the level of the specific sound (distinct and free from other influences contributing to the ambient sound), and the acoustic features of the specific sound (which increases the significance of impact).

3.8 A character correction is applied to the specific sound level to account for the acoustic features to obtain a rating level. The corrections to be considered are:

3.9 Tonality – For sound ranging from not tonal to prominently tonal the Joint Nordic Method gives a correction of between 0 dB and +6 dB for tonality. Subjectively, this can be converted to a penalty of 2 dB for a tone which is just perceptible at the noise receptor, 4 dB where it is clearly perceptible, and 6 dB where it is highly perceptible.

3.10 Impulsivity – A correction of up to +9 dB can be applied for sound that is highly impulsive, considering both the rapidity of the change in sound level and the overall change in sound level. Subjectively, this can be converted to a penalty of 3 dB for impulsivity which is just perceptible at the noise receptor, 6 dB where it is clearly perceptible, and 9 dB where it is highly perceptible.

3.11 Intermittency – When the specific sound has identifiable on/off conditions, the specific sound level should be representative of the time period of length equal to the reference time interval which contains the greatest total amount of on time. This can necessitate measuring the specific sound over a number of shorter sampling periods that are in combination less than the reference time interval in total, and then calculating the specific sound level for the reference time interval allowing for time when the specific sound is not present. If the intermittency is readily distinctive against the residual acoustic environment, a penalty of 3 dB can be applied.

3.12 Other sound characteristics - Where the specific sound features characteristics that are neither tonal nor impulsive, nor intermittent, though otherwise are readily distinctive against the residual acoustic environment, a penalty of 3 dB can be applied.

3.13 An initial estimate of the impact is found by subtracting the background sound level from the rating level with the results compared to the criteria presented in **Table 3.1**.

Rating Level	Impact
Equal to or less than Background	Indication of Low Impact, depending on context
+5dB above Background	Indication of Adverse Impact, depending on context
+10dB or more above Background	Indication of Significant Adverse Impact, depending on context

Table 3.1 Impact Assessment

3.14 However, the significance of the sound depends on both the margin above background and the context in which the sound occurs. The above estimate should therefore be modified to consider factors such as absolute level of sound, character and level of residual sound, and the sensitivity of the receptor.

British Standard 8233:2014 Guidance on sound insulation and noise reduction for buildings

3.15 BS8233 provides guidance for the control of noise in and around buildings. The scope of the document is applicable for new and refurbished buildings undergoing a change of use but is considered relevant for context.

3.16 The recommendations from BS8233 for steady external noise sources are presented in **Table 3.2**.

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living room	35 dB $L_{Aeq, 16hr}$	-
Dining	Dining room/area	40 dB $L_{Aeq, 16hr}$	-
Sleeping (daytime resting	Bedroom	35 dB $L_{Aeq, 16hr}$	30 dB $L_{Aeq, 8hr}$

Table 3.2 Indoor Noise Levels for Dwellings

3.17 The guidance also provides criteria for external areas and states:

> *"For traditional external areas that are used for amenity space, such as gardens and patios, it is desirable that the external noise level does not exceed 50 dB $L_{Aeq,T}$, with an upper guideline value of 55 dB $L_{Aeq,T}$ which would be acceptable in noisier environments. However, it is also recognized that these guideline values are not achievable in all circumstances where development might be desirable. In higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces, but should not be prohibited."*

4 Noise Survey

Survey Details

4.1 A baseline noise survey was undertaken between Friday 25th and Monday 28th April 2025 to capture the prevailing noise climate in the area.

4.2 The noise meter was installed near to Abergelli Farm which is considered representative of both of the nearest noise-sensitive receptors with the noise monitoring location (NML) indicated in **Figure 4.1** below.

Figure 4.1 Noise Monitoring Location

4.3 The noise meter was at a height of approximately 1.5m in free-field conditions with the data logged every 15-minutes.

4.4 Details of the monitoring equipment can be found in **Appendix B**. On-site calibration was undertaken before and after measurements with no significant drift observed.

Weather Conditions

4.5 Weather conditions during the equipment installation and collection were suitable for environmental noise monitoring being dry with negligible wind which was forecast to remain throughout the survey.

Noise Climate

4.6 During installation and collection, construction noise was noted from the south-east which is associated with the Greener Grid Park Facility development (planning permission ref: 2021/0163/FUL). The construction works are undertaken during daytime only so would not impact on night-time measurements which this assessment is based on due to this being the worst-case period. Other sources of note were natural sounds including birdsong and livestock.

Monitoring Results

4.7 A summary of the measured noise levels is presented in **Table 4.1**.

Date	Period	$L_{Aeq, 15min}$	$L_{A10, 15min}$	$L_{A90, 15min}$	L_{Amax}
25/04/25	13:00 – 23:00	46.2	47.2	39.4	69.6
	23:00 – 07:00	54.7	41.4	35.7	92.0
26/04/25	07:00 – 23:00	46.9	48.3	35.5	72.6
	23:00 – 07:00	46.0	38.9	32.0	69.9
27/04/25	07:00 – 23:00	45.5	47.2	35.5	71.7
	23:00 – 07:00	47.3	38.4	32.9	79.4
28/04/25	07:00 – 15:15	46.8	48.9	39.6	72.2

Table 4.1 Summary of Noise Levels at NML1

4.8 To determine a representative background sound level during the worst-case period (night-time), the number of occurrences of the measured sound level during this period has been considered. The results are presented in **Figure 4.2**.

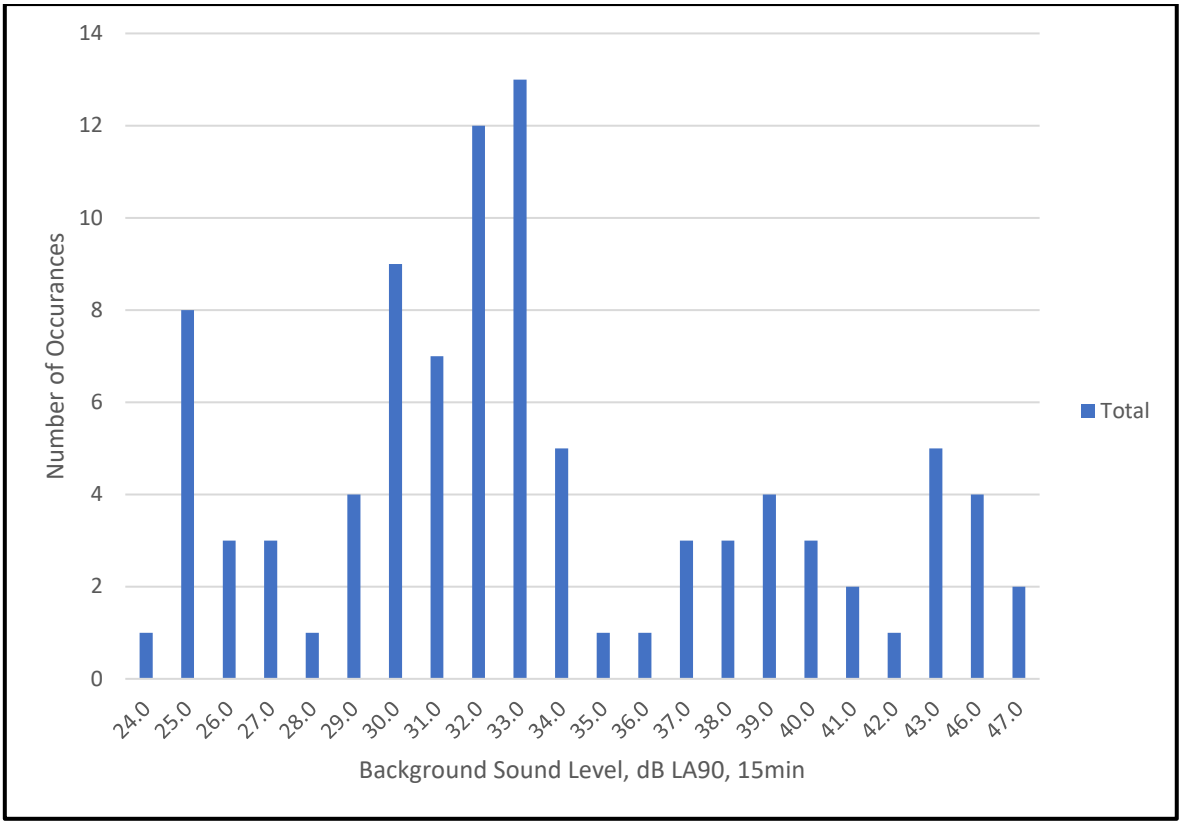

Figure 4.2 Occurrences of Background Sound Level

4.9 As part of the commentary presented in BS4142 it states:

> *"In using the background sound level in the method for rating and assessing industrial and commercial sound it is important to ensure that values are reliable and suitably represent both the particular circumstances and periods of interest. For this purpose, the objective is not simply to ascertain a lowest measured background sound level, but rather to quantify what is typical during particular time periods."*

4.10 Whilst a level of 33dB $L_{A90,\ 15min}$ is the most commonly occurring background sound level, a level of 32dB $L_{A90,\ 15min}$ is considered representative of the background sound level with noise levels less than 32dB only experienced for 38% of the time.

5 Noise Assessment

Operational Noise Assessment

5.1 Predictions of the proposed operational noise of the proposed BESS have been carried out to consider these against the results of the baseline survey.

5.2 Details of the proposed noise generating equipment to be installed on Site have been provided by the applicant. Sound power levels for the candidate plant is provided in **Table 5.1**. The battery source level is based on 100% of maximum power for temperatures of less than 35^0C.

Type of Machinery	Quantity on Site	Source Height, m	Sound Power Level, dB
PowerTitan2.0	112	2	81
MVS SCC	64	2	84
Transformer	1	2	74

Table 5.1 Operational Plant

5.3 The noise predictions have been undertaken using the proprietary software IMMI; a 3-D noise mapping package which implements a wide range of national and international standards, guidelines and calculation algorithms, including those set out in ISO9613-2.

5.4 The noise map model has assumed:

- downwind propagation, i.e. a wind direction that assists the propagation of sound from source to receptor;
- a maximum reflection factor of three where buildings and barriers are assumed to have a ‘smooth’ reflective façade, as a worst case; and
- that noise sources do not have strong radiation patterns and therefore radiate equally in all directions.

5.5 The predicted noise levels at the nearby noise-sensitive receptors are presented in **Table 5.2**.

Sensitive Receptor	Predicted Noise Level, dB
Abergelli Farm	40
Maes-Eglwys	29

Table 5.2 Predicted Operational Noise Levels

5.6 Analysis of the impact in accordance with BS4142 has been undertaken as presented in **Table 5.3**.

Results	Abergelli Farm	Commentary	Maes-Eglwys	Commentary
Background sound level	32dB $L_{A90, 15min}$	Representative of background sound levels in the area	32dB $L_{A90, 15min}$	Representative of background sound levels in the area
Specific sound level predicted	40dB $L_{Aeq, 15min}$		29dB $L_{Aeq, 15min}$	
Acoustic feature correction	0dB	Based on the distance between source and receptor and the low predicted specific sound level compared to ambient sound levels, it is not considered that the noise would have a distinct character	0dB	Based on the distance between source and receptor and the low predicted specific sound level compared to ambient sound levels, it is not considered that the noise would have a distinct character
Rating level	(40 + 0) dB = 40dB		(29 + 0) dB = 29dB	
Excess of rating over background sound level	(40 - 32) dB = +8dB	The assessment indicates likelihood of adverse impact	(29 - 32) dB = -3dB	The assessment indicates likelihood of low impact
Uncertainty of the assessment	Based on night-time period when background is lower and measurements undertaken over a number of days. Would require a significant increase in source level or reduction in background sound level to increase impact to significant adverse.		Based on night-time period when background is lower and measurements undertaken over a number of days. Would require a significant increase in source level or reduction in background sound level to increase impact to adverse.	

Table 5.3 BS4142 Assessment

5.7 As presented in **Table 5.3**, the results of the BS4142 assessment indicates a low impact at Maes-Eglwys and an adverse impact at Abergelli Farm based on the worst-case assessment period during the night-time and operating at maximum power.

5.8 For context, the predictions are based on maximum power. Operational data provided by the applicant indicates that maximum power occurs for less than 1% of operational time. At all other times, the sound power level is reduced by approximately 2dB compared to the data presented in **Table 5.1**.

5.9 Notwithstanding, the predicted specific sound level is significantly below the ambient sound level in the area (approximately 46dB during the night). Furthermore, based on a partially open window achieving a sound reduction of approximately 15dB, the indoor noise level at the receptors from the operation of the BESS would be significantly below the guideline values presented in BS8233 for bedrooms at night of 30dB.

5.10 Based on the above, the operation of the BESS is considered to have a low impact at all assessed locations.

6 Summary and Conclusions

Summary

6.1 Rappor Consultants Limited was instructed by EDF Renewables to undertake an operational noise assessment of the proposed Battery Energy Storage System (BESS) facility on land at Abergelli Farm, Felindre.

6.2 Noise predictions of the proposed operation of the BESS have been assessed against the results of a baseline noise survey in accordance with BS4142.

6.3 The BS4142 assessment indicates that the operation of the BESS would result in a low impact at the nearby noise-sensitive receptors, once context has been taken into account.

Conclusions

6.4 Rappor concludes that based on the results of the noise assessment, it is considered that noise does not represent a material constraint to the development.

Appendix A – Acoustic Terminology

Glossary of Acoustic Terminology

Term	Description
Ambient Sound Level, $L_{Aeq,\ T}$	Equivalent continuous A-weighted sound pressure level of the totally encompassing sound in a given situation at a given time, usually from many sources near and far, at the assessment location over a given time interval, T
Background Sound Level, $L_{A90,T}$	A-weighted sound pressure level that is exceeded by the residual sound at the assessment location for 90% of a given time interval, T, measured using time weighting, F, and quoted to the nearest whole number of decibels
Specific Sound Level	Equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment location over a given reference time interval, Tr
Rating level, $L_{Ar,Tr}$	Specific sound level plus any adjustment for the characteristic features of the sound

Appendix B – Monitoring Equipment

Details of Monitoring Equipment

Item Description	Serial Number
Svantek SV307A Class 1 Sound Level Meter	116148
Cirrus CR:515 Acoustic Calibrator	96168

Rappor Consultants Ltd

www.rappor.co.uk

Cheltenham
Bristol
London
Bedford
Exeter
Manchester