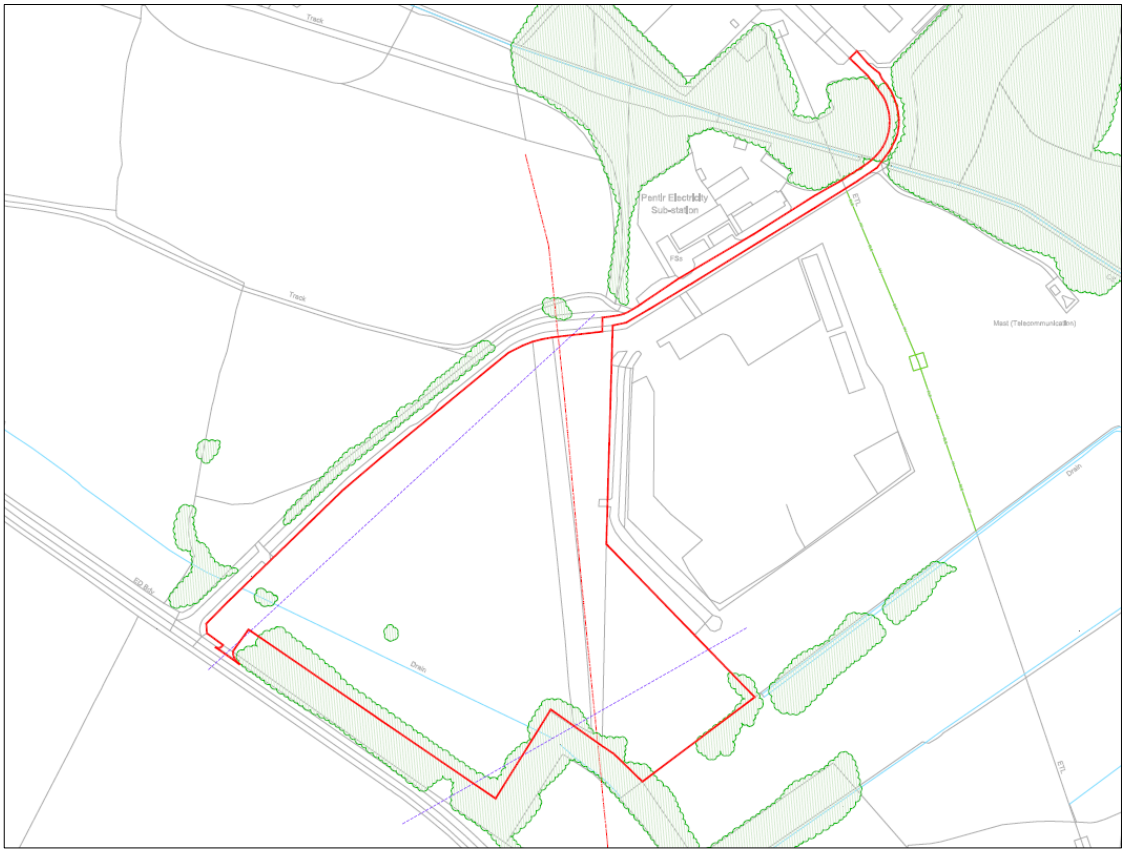
Proposed Energy Storage System on land at Tyddyn Forgan

784-B068934



Noise Assessment

Net Zero Twenty-Six Limited

February 2025

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Acronyms/Abbreviations

Acronyms/Abbreviations	Definition
CADNA	Computer Aided Noise Abatement
DMRB	Design Manual for Roads and Bridges
HGV	Heavy Goods Vehicle
PPG	Planning Practice Guidance
UDP	Unitary Development Plan
UKAS	United Kingdom Accreditation Service

Executive Summary

This report presents the findings of a noise assessment to support a planning application for a Proposed Energy Storage System (ESS) at Tyddyn Forgan.

BS4142:2014+A1:2019 Assessment:

A BS 4142 assessment of the impact of the proposed development against existing background sound levels at the closest receptors has been undertaken. For the daytime and night-time periods, Rating Noise Levels are predicted to be below the existing background noise levels, which in accordance with BS 4142:2014 is considered to represent a low impact.

Noise Intrusion Assessment:

A noise intrusion assessment has been carried out to predict noise from operations at the site upon receptors. Predicted daytime and night-time noise levels are below the BS 8233 daytime and night-time internal noise criteria of 35dB and 30 dB $L_{Aeq,T}$ respectively at all receptors.

Change in Noise Level Assessment:

The contribution of the proposed scheme at the closest receptors is predicted to result in a +0.1dB change in the existing ambient noise levels, indicative of a negligible short-term impact.

It has been predicted that on-site operational noise effects associated with the Development will not be significant and therefore the development will have a negligible impact in relation to noise.

1.0 Introduction

1.1 Purpose of this Report

This report presents the findings of a noise assessment to support a planning application for a Proposed Energy Storage System (ESS). The site is located to the north of the B4547 broadly adjacent to Pentir Substation, located approximately 2.8km to the south of Bangor in north Wales.

The development scheme comprises an ESS that will connect with the substation to serve the National Grid and, for the avoidance of doubt, the access junction will continue to serve the ESS.

Noise surveys have been undertaken and the results used to verify predictions of the short-term and long-term effects of noise.

A list of acoustic terminology used in this report is provided in Appendix A.

1.2 Legislative Context

1.2.1 Planning Policy Wales

This report is intended to provide information relevant to the local planning authority and their consultees in support of a planning application for the above proposed development. Future Wales: The National Plan 2040 February 2021 and Planning Policy Wales (PPW) February 2024 sets out the land use planning policies of the Welsh Government. They are supplemented by a series of Technical Advice Notes (TANs), Technical Advice Note 11 which relates to Noise, Welsh Government Circulars, and policy clarification letters, which together with PPW provide the national planning policy framework for Wales. The primary objective of PPW is to ensure that the planning system contributes towards the delivery of sustainable development and improves the social, economic, environmental and cultural well-being of Wales.

Paragraph 6.7.5 of PPW states:

> *"In taking forward these broad objectives the key planning policy principle is to consider the effects which proposed developments may have on air or soundscape quality and the effects which existing air or soundscape quality may have on proposed developments. Air quality and soundscape influence choice of location and*

distribution of development and it will be important to consider the relationship of proposed development to existing development and its surrounding area and its potential to exacerbate or create poor air quality or inappropriate soundscapes. The agent of change principle says that a business or person responsible for introducing a change is responsible for managing that change. In practice, for example, this means a developer would have to ensure that solutions to address air quality or noise from nearby pre-existing infrastructure, businesses or venues can be found and implemented as part of ensuring development is acceptable."

Paragraphs 6.7.6 and 6.7.7 state:

"In proposing new development, planning authorities and developers must, therefore:

address any implication arising as a result of its association with, or location within, air quality, noise action planning priority areas or areas where there are sensitive receptors;

• not create areas of poor air quality or inappropriate soundscape; and

• seek to incorporate measures which reduce overall exposure to air and noise pollution and create appropriate soundscapes.

To assist decision making it will be important that the most appropriate level of information is provided and it may be necessary for a technical air quality and noise assessment to be undertaken by a suitably qualified and competent person on behalf of the developer."

Paragraph. 6.7.24 states:

"The potential impacts of noise pollution arising from existing development, be this commercial, industrial, transport-related or cultural venues (such as music venues, theatres or arts centres), must be fully considered to ensure the effects on new development can be adequately controlled to safeguard amenity and any necessary measures and controls should be incorporated as part of the proposed new development. This will help to prevent the risk of restrictions or possible closure of existing premises or adverse impacts on transport infrastructure due to noise and other complaints from occupiers of new developments. It will be important that the most appropriate level of information is provided, and assessment undertaken."

TAN 11 further goes on to provide advice on how the planning system can be used to minimise the adverse impacts of noise without placing unreasonable restrictions on development or adding unduly costs and administrative burdens of business.

1.3 Acoustic Consultants' Qualifications and Professional Memberships

The lead project Acoustic Consultant is Michaela Moffatt. The report has been checked by Najwa Adnan-Smith and verified by Dawit Abraham. Relevant qualifications, membership and experience are summarised in Table 1.1 below.

Table 1.1: Acoustic Consultants' Qualifications & Experience

Name	Education	Experience in Undertaking Noise Assessments (Start date of working in noise & acoustics)	Attained Associate Membership of the Institute of Acoustics (date)	Attained Membership of the Institute of Acoustics (date)
Michaela Moffatt	BSc 2015 PgDip 2016 MSc 2018	Nov 2015	Jan 2017	Dec 2022
Najwa Adnan-Smith	BSc 2016 PgDip 2024	Oct 2022	Jan 2025	-
Dawit Abraham	BSc 2008 MSc 2010	Oct 2010	Jan 2011	Jan 2015

2.0 Assessment Criteria

2.1 British Standard 4142:2014: A1+2019 Methods for Rating and Assessing Industrial and Commercial Sound

British Standard, BS 4142:2014+A1:2019 provides methods for rating and assessing sound of an industrial and/or commercial nature.

The methodology compares the level of the industrial / commercial sound, corrected to account for perceived aspects such as tonality, impulsivity, intermittency, or other acoustic feature and compares against the background sound level.

The significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound source exceeds the background sound level and the context in which the sound occurs. The assessment of impacts is determined by considering the following;

- Typically the greater the difference the greater the magnitude of the impact.
- A difference of around +10 dB 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.

2.2 BS 8233:2014 Guidance on Sound Insulation and Noise Reduction for Buildings

The British Standard, BS 8233:2014 provides guidance on internal sound levels within residential dwellings. The recommended guideline levels for living room and bedroom spaces during the daytime and night-time are presented in Table 2.1.

Table 2.1: BS 8233:2014 and WHO 1999 Internal Noise Guideline Levels

Activity	Location	Daytime 07:00 to 23:00	Night-time 23:00 to 07:00
Resting	Living Room	35 dB $L_{Aeq,16hr}$	-
Dining	Dining room / area	40 dB $L_{Aeq,16hr}$	-
Sleeping	Bedroom	35 dB $L_{Aeq,8hr}$	30 dB $L_{Aeq,8h}$

If relying on closed widows to meet the criterion, there needs to be appropriate alternative ventilation that does not compromise the facade insulation or the resulting noise level. If applicable, any room should have adequate ventilation (e.g., trickle ventilator should be open) during the assessment. Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target levels may be relaxed by up to 5 dB and 'reasonable' internal conditions still achieved.

In WHO 1999, an upper guideline value of 55 dB $L_{Aeq,16hr}$ is indicated as a criterion threshold below which few people are seriously annoyed for an outdoor living area, during daytime and evening hours. A lower guideline value of 50 dB $L_{Aeq,16hr}$ is provided as a criterion below which few people are annoyed. In addition, the guidance identifies that negative sleep impacts are avoided at 30 dB $L_{Aeq,8h}$ for continuous noise sources.

2.3 IEMA 2014 Guidelines for Environmental Noise Impact Assessment

The Institute of Environmental Management and Assessment (IEMA) guidelines from 2014 provide criteria for assessing changes in noise levels.

Table 2.2: Impact from the Change in Noise Level

Magnitude of Change	Description	Example
Negligible	No perceptible change in noise levels	Change in noise level less than 1 dB(A)
Minor	Small change in noise levels, unlikely to be significant	Change in noise level between 1 and 3 dB(A)
Moderate	Noticeable change in noise levels, may be significant depending on context	Change in noise level between 3 and 5 dB(A)
Major	Large change in noise levels, likely to be significant	Change in noise level greater than 5 dB(A)

3.0 Assessment Methodology

3.1 Noise Modelling Methodology

Three-dimensional noise modelling has been undertaken based on the monitoring data to predict noise levels at a number of locations both horizontally and vertically. CADNA noise modelling software has been used. This model is based on ISO 9613-2 noise propagation methodology and allows for detailed prediction of noise levels to be undertaken for large numbers of receptor points and different noise emission scenarios both horizontally and vertically. The modelling software calculates noise levels based on the emission parameters and spatial settings that are entered. Input data and model settings as given in Table 3.1 below have been used.

Table 3.1: Modelling Parameters Sources and Input Data

Parameter	Source	Details
Horizontal distances – around site	Ordnance Survey	Ordnance Survey
Ground levels – around site	DEFRA	LIDAR 1m DTM
Building heights – around site	Tetra Tech Observations	• 4.0m height for one-storey properties • 8.0 m height for two storey properties • 3.0m per additional storey
Receptor positions*	Tetra Tech	• 1.5 m for ground floor properties • 4.0m height for first-floor properties • 3.0m per additional storey
Modelling Parameters	Tetra Tech	• Ground Absorption: 0.8 • Order of Reflections: 3 • Noise Contour Plot Grid Receiver Spacing: 4*4
Proposed Plans	CADmando	Drawing Title: Tyddyn Forgan ESS Proposed Site Layout Plan Drawing No: FST016-PL-01
*All receptors modelled 1.0m from building façade unless otherwise stated.		

It is acknowledged that a number of the values of parameters chosen will affect the overall noise levels presented in this report. However, it should be noted that the values used, as identified above, are worst-case.

3.2 Model Input Data

While the operational usages of the ESS will be dictated by demand, it is generally expected that the ESS will charge for a maximum of two hours and discharge for a maximum of 2 hours in any 24 hour period.

To inform a worst-case assessment, it has been assumed that the proposed development is fully operational during the daytime and night-time periods assessment.

The assumed primary sources of noise from the operational development are listed below and reproduced in Table 3.2 and Table 3.3.

- 100 no. ESS Units
- 25 no. inverters linked to 13 MV skid units
- 4 no. Substation Transformers (Total: 132kV)

Table 3.2: Sound Pressure Level Data

Plant Item	Data Source	Broadband Sound Pressure Level (dBA)	Octave Band (Hz) Sound Pressure Level (dB)							
			63	125	250	500	1k	2k	4k	8k
Battery Container	Solbank	68.2 at 1m	36.6	53.0	51.7	59.2	59.5	62.1	62.9	56.9

Table 3.3: Sound Power Level Data

Plant Item	Data Source	Broadband Sound Power Level (dBA)	Octave Band (Hz) Sound Pressure Level (dB)							
			63	125	250	500	1k	2k	4k	8k
SMA inverter	SMA	91.9	65.2	72.0	81.9	81.9	81.7	82.2	88.9	80.8
Substation Transformer	-	65	No spectrum data supplied but TRF_VERTEIL_LA (Distribution-Trafo low noise) spectrum on CadnaA has been used for a typical spectrum of a transformer.							

3.3 Sensitive Receptors

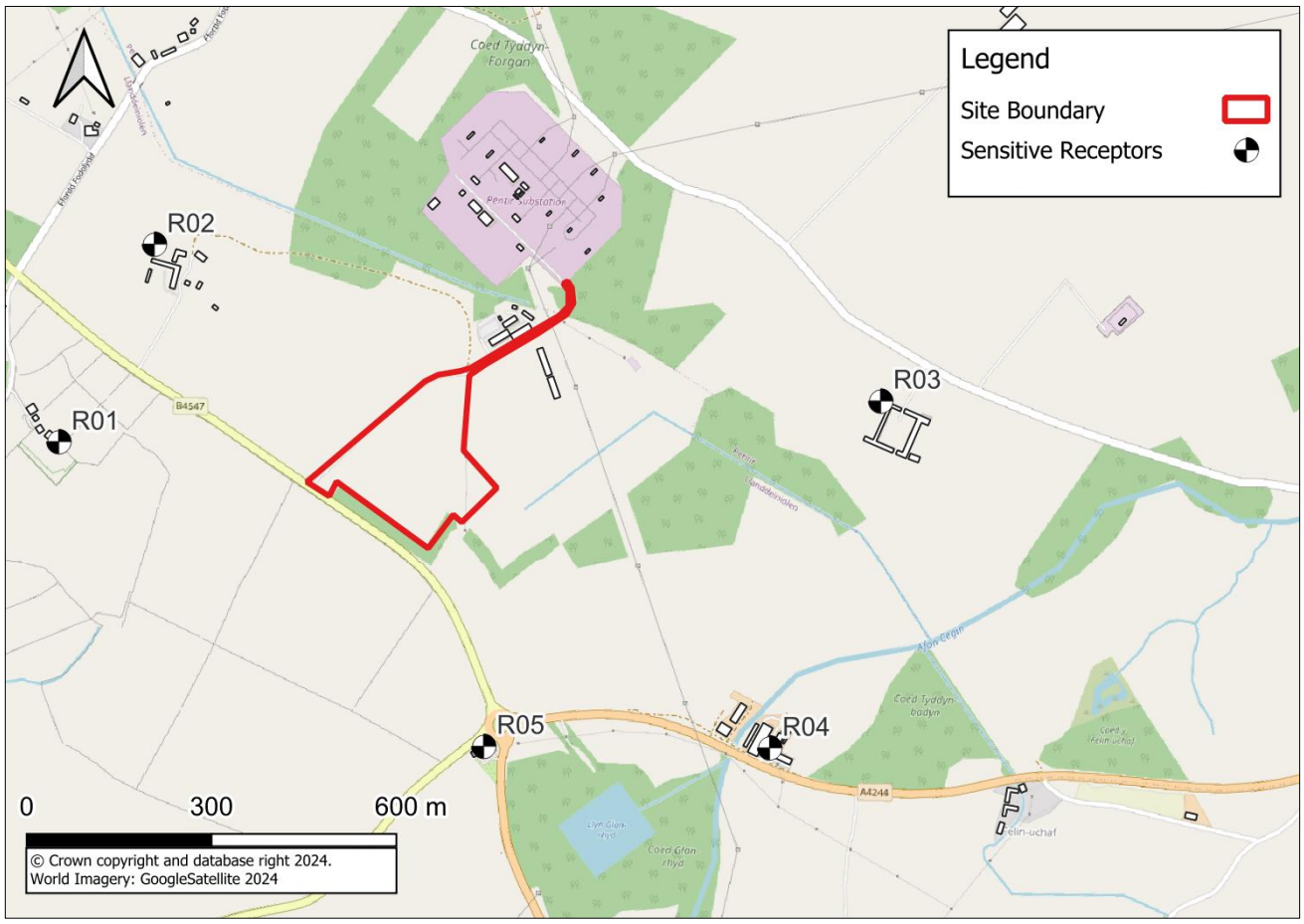
3.3.1 Existing Sensitive Receptor Locations

Table 3.4 below summarises receptor locations that have been selected to represent worst-case sensitive receptors with respect to direct noise from the site. Façades of the nearest noise sensitive properties to the development site have been represented. The locations of the receptors are presented within Figure 3.1.

Table 3.4: Existing Sensitive Receptor Locations

Ref.	Description	Type of Use	Height (m) Daytime / Night-time
R01	Cae-gwydryn, LL55 3AL	Residential	4.0
R02	Tyddyn Forgan, LL55 3AN	Residential	4.0
R03	Ty'n-llwyn, LL57 4EB	Residential	4.0
R04	Glanrhyd, LL57 4EB	Residential	4.0
R05	Groeslon Ty Mawr, LL55 3AW	Residential / B&B	4.0

Figure 3.1: Sensitive Receptor Locations



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4.0 Noise Survey

4.1 Noise Survey Details

A monitoring survey was undertaken to characterise baseline ambient noise levels currently experienced on the site and to establish the relative local background and traffic noise levels. Equipment used during the survey included:

Rion NL-52	Environmental Noise Analyser	s/n	01221575
Rion NL-52	Environmental Noise Analyser	s/n	810558
Rion NL-52	Environmental Noise Analyser	s/n	01043466
Rion NC-75	Sound Calibrator	s/n	34735017

The measurement equipment was checked against the appropriate calibrator at the beginning and end of the measurements, in accordance with recommended practice. The accuracy of the calibrators can be traced to National Physical Laboratory Standards, calibration certificates for which are available on request.

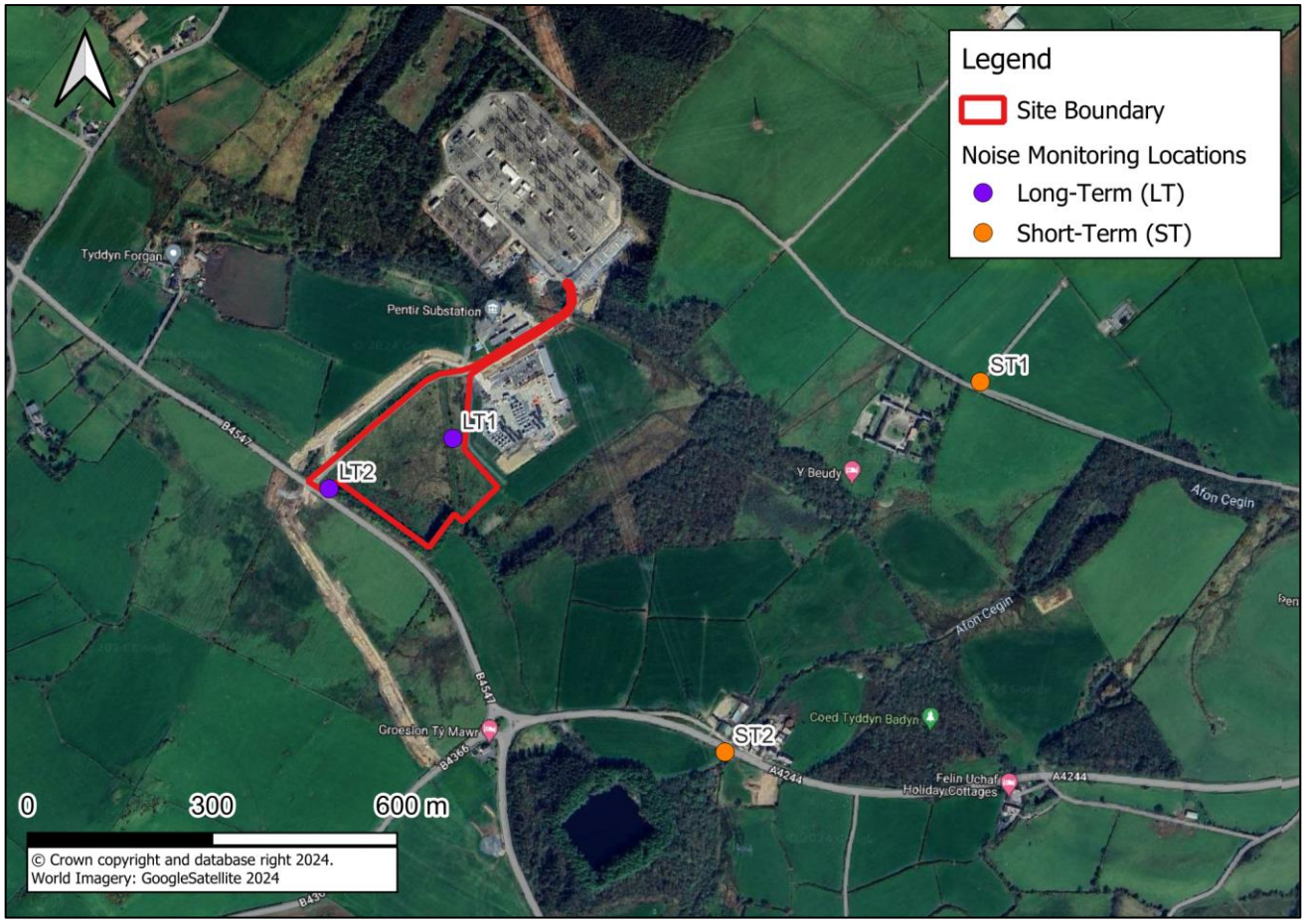
A baseline monitoring survey was undertaken at four locations (as specified in Table 4.1 and shown in Figure 4.1 below) from Thursday 30th January 2025 to Monday 3rd February 2025. Attended Short-term (ST) locations were measured at 2 locations during the day, evening and night periods, 2 additional Long-term (LT) locations were measured unattended over a 24-hour period. The raw data collected from the long-term monitoring is available upon request.

Measurements were taken in general accordance with BS 7445-1:2003 The Description and Measurement of Environmental Noise: Guide to quantities and procedures. Weather conditions during the survey period were observed as being dry. Anemometer readings confirmed that wind speeds were less than 5 ms^{-1} at all times during the survey, with a predominant north-eastern wind direction during the survey.

Table 4.1: Noise Monitoring Locations

Ref	Description
LT1	Found North-East within the site boundary.
LT2	Found South-West of the Site adjacent to B4547.
ST1	Found North-West of the Site Boundary.
ST2	Found South-East of the Site Boundary, along A4244.

Figure 4.1: Noise Monitoring Locations



4.2 Noise Survey Results

The dominant noise sources found in the area include road traffic noise from Felixstowe Road and A14. Other contributions to the ambient noise environment consist of birdsong and train passes.

Ambient and background noise levels are usually described using the L_{Aeq} index (a form of energy average) and the L_{A90} index (i.e. the level exceeded for 90% of the measurement period) respectively. Road traffic noise is generally described using the L_{A10} index (i.e. the level exceeded for 10% of the measurement period). For the long-term (LT) locations, the presented $L_{Aeq,T}$ and $L_{A10,T}$ are average noise levels whilst the L_{A90} is the modal noise level of each 5-minute measurement over the stated survey period.

Table 4.2: Meteorological Conditions During the Survey

Survey Location	Date & Time	Temperature (ºC)	Wind Speed (m/s)	Wind Direction	Dominant Noise Source
LT1	30/01/2025 14:02	5	2.2	NE	Birdsong/Road noise from B4547
LT2	30/01/2025 12:38	5	2.2	NE	Birdsong/Road Noise from B4547
ST1	30/01/2025	5	2.2	NE	Birdsong
ST2	30/01/2025	5	2.2	NE	Road Noise from A4244

The results of the statistical measurements and frequency measurements conducted during the survey are summarised in the following table. All values are sound pressure levels in dB (re: 2 x 10^{-5} Pa).

Table 4.3: Results of Baseline Noise Monitoring Survey (Average Levels)

Period	Duration (T)	Monitoring Date and Times	Location	$L_{Aeq,T}$ (dB)	$L_{Amax,T}$ (dB)	$L_{Amin,T}$ (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)
Weekday Daytime 07:00 - 23:00	31.5	30/01/2025 15:57	LT1	53.8	86.8	30.4	55.4	52.0
Weekday Night-time 23:00 – 07:00	16	30/01/2025 23:02		45.0	65.4	24.8	45.2	32.0
Weekend Daytime 07:00 - 23:00	32	01/02/2025 07:02		52.0	72.0	29.7	54.1	46.0
Weekend Night-time 23:00 – 07:00	16	01/02/2025 23:02		46.9	68.8	28.3	46.3	40.0
Weekday Daytime 07:00 - 23:00	31.5	30/01/2025 12:38	LT2	67.5	90.3	27.6	71.0	54.0
Weekday Night-time 23:00 – 07:00	16	30/01/2025 23:03		57.8	84.7	22.1	48.9	32.0
Weekend Daytime 07:00 - 23:00	32	01/02/2025 07:03		66.6	91.1	28.1	69.5	42.0

Period	Duration (T)	Monitoring Date and Times	Location	$L_{Aeq,T}$ (dB)	$L_{Amax,T}$ (dB)	$L_{Amin,T}$ (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)
Weekend Night-time 23:00 – 07:00	16	01/02/2025 23:03		58.8	87.0	25.8	53.7	44.0
Daytime 07:00 - 19:00	15 Mins	30/01/2025 16:40	ST1	54.0	78.4	40.8	49.2	44.7
	15 Mins	30/01/2025 17:05	ST2	71.7	91.7	46.3	75.8	56.2
Evening 19:00 - 23:00	15 Mins	30/01/2025 19:25	ST1	43.2	56.2	37.7	45.1	40.4
	15 Mins	30/01/2025 19:00	ST2	68.1	83.6	41.0	73.3	45.9
Night-time 23:00 - 07:00	15 Mins	30/01/2025 23:00	ST1	54.8	74.4	44.1	57.9	47.5
	15 Mins	30/01/2025 23:20	ST2	54.1	73.1	41.8	57.2	45.1

All values are sound pressure levels in dB re: 2 x 10^{-5} Pa.

4.3 Representative Background Noise Levels

Using the data collected during the baseline survey, representative background noise levels have been derived for all receptor locations presented in Figure 3.1. Table 4.4 presents the representative background noise levels considered appropriate for the existing sensitive receptors within the area (the lower of the respective daytime and evening measurements have been used to represent daytime noise levels, where appropriate).

Table 4.4: Representative Background Noise Levels (All Receptors)

Receptors	Monitoring Location	Time Period	Representative Background Noise Level ($L_{A90,T}$ dB)*
R01, R04, R05	LT2/ST2	Daytime (07:00 – 23:00)	42
		Night-time (23:00 – 07:00)	32
R02, R03	LT1/ST1	Daytime (07:00 – 23:00)	45
		Night-time (23:00 – 07:00)	32

*Lowest $L_{A90,T}$ value selected from either Weekday or Weekend.

The representative noise levels presented in Table 4.4 have been used to inform the assessment presented in Section 5.0

5.0 Assessment of Effects

5.1 Operational Phase

5.1.1 BS 4142:2014 Noise Assessment

The assessment below compares the predicted noise levels from the proposed development with the existing background noise level (L_{A90}) at the surrounding noise sensitive receptors.

Considering the low background now levels in the area, a +2 dB correction has been applied to the predicted noise levels to account for tonal attributes to be potentially just perceptible against the residual acoustic environment.

The results of the plant noise assessment are presented within Table 5.1, and illustratively shown within Figure 5.1.

Figure 5.1: Noise Contour Plot $L_{Aeq,1hour}$ – 4.0m Above Ground

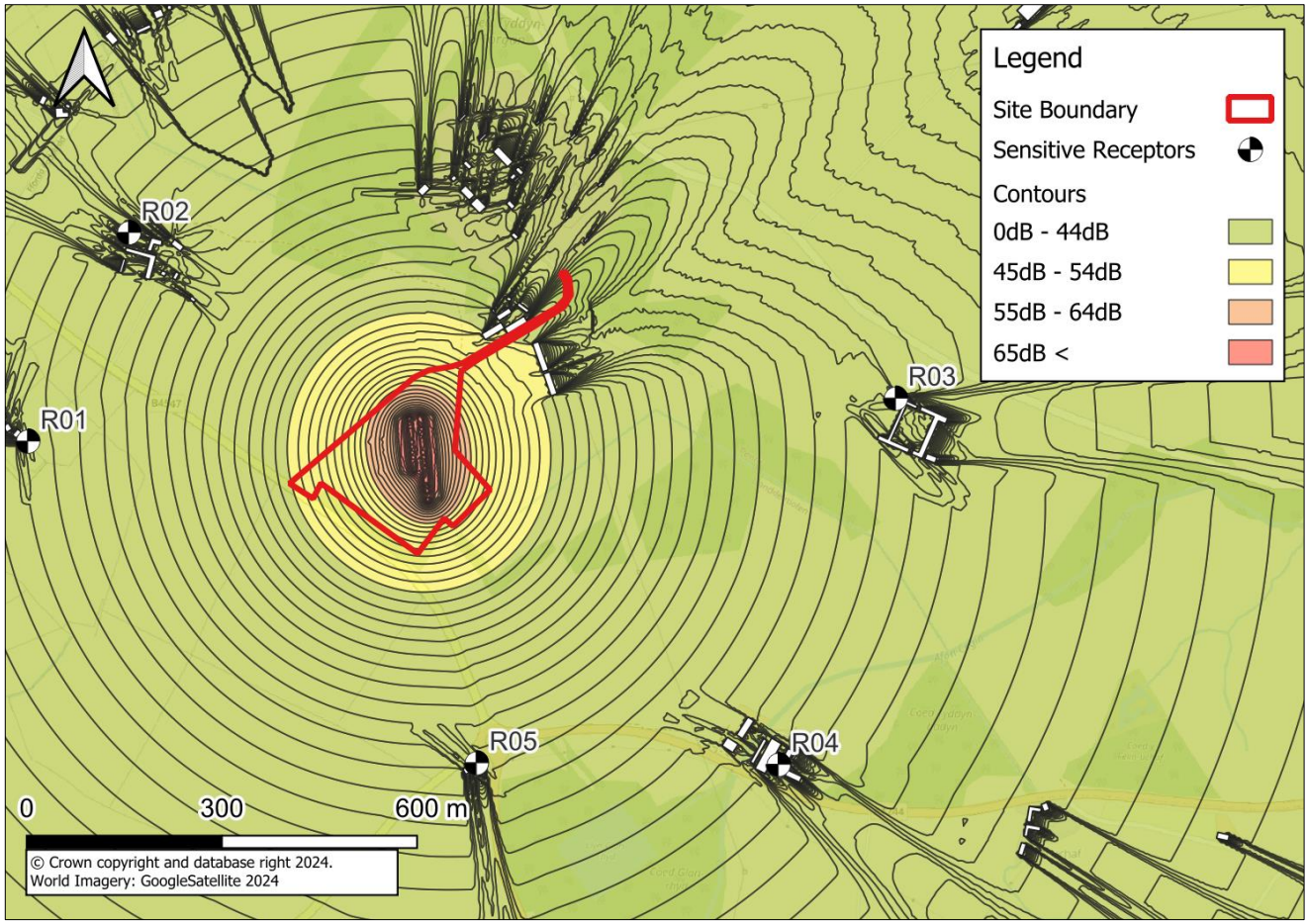


Table 5.1: BS4142 Assessment

Location	Existing Measured Background L_{A90}		Noise rating level from plant		BS 4142 Score	
	Daytime	Night-time	Daytime	Night-time	Daytime	Night-time
R01	42	32	33	33	-9	+1
R02	45	32	28	28	-17	-4
R03	45	32	31	31	-14	-1
R04	42	32	23	23	-20	-10
R05	42	32	36	36	-6	+4

All values are sound pressure levels in dBA re: 2x 10^{-5} Pa.
All calculations used to derive the above table (including averaging of background noise levels and predicted source noise levels) have been undertaken to 1 decimal place to avoid perpetuation of rounding errors. However, in accordance with BS4142 para 8.6 the levels are expressed as integers (with 0.5 dB being rounded up). This may mean that the arithmetic in the above table may appear to be up to 1 dB incorrect due to this rounding.

As demonstrated within Table 5.1, the results of the assessment indicate that the BS4142 Noise Rating Levels at sensitive façades are all below the adopted background sound level during the daytime. During the night-time, the Noise Rating Levels at R02 to R04 are below the adopted background sound level and R01 and R05 exceed the adopted background by +1dB and +4dB, respectively. As such, indication of an impact between Low Impact and Adverse Impact, depending on the context.

BS 4142 does not define ‘low’ in the context of background sound levels or rating levels. The note to the Scope of the 1997 version of BS 4142 defined very low background sound levels as being less than about 30dB $L_{A90,T}$ and low rating levels as being less than about 35 dB $L_{Ar,T}$.

BS 4142 does not indicate how the initial estimate of impact should be adjusted when background and rating levels are low, only that the absolute levels may be more important than the difference between the two values. Where the background levels are low, the absolute levels might suggest a more acceptable outcome than would otherwise be suggested by the difference between the values (existing and proposed noise rating levels).

5.1.2 Noise Intrusion Assessment

Internal noise levels at sensitive receptor locations, from all noise sources have been assessed with windows open, where a reduction from a partially open window of 13 dB has been used.

Results of the noise intrusion assessments for average daytime and night-time noise levels are presented within Tables 5.2 respectively.

Table 5.2: Noise Intrusion Levels $L_{Aeq,1hour}$

Location	External L_{Aeq}	Internal L_{Aeq} with windows open	Criteria L_{Aeq}	
			Daytime	Night-time
R01	42	21	35	30
R02	45	16	35	30
R03	45	19	35	30
R04	42	11	35	30
R05	42	24	35	30

All values are sound pressure levels in dBA re: 2 x 10^{-5} Pa.

As demonstrated within Table 5.2, predicted noise levels achieve the internal noise criteria for habitable rooms.

5.1.3 Change in Noise Level Assessment

This assessment has been undertaken to compare worst-case representative noise levels from the 'existing ambient noise levels' (L_{Aeq}) to predicted ambient noise levels inclusive of the proposed scheme at existing sensitive receptors. The differences between the 'existing' and the 'proposed' development scenarios, during the daytime and night-time are presented in Table 5.3.

Table 5.3: Change in Noise Level Assessment

Ref	Baseline L_{Aeq} (Monitored)		Proposed L_{Aeq} (Modelled)		Combined L_{Aeq}		Contribution from Proposed Scheme dB	
	Daytime	Night-Time	Daytime	Night-Time	Daytime	Night-Time	Daytime	Night-Time
R01	54.0	54.0	31.3	31.3	54.0	54.0	0.0	0.0
R02	52.0	45.0	25.8	25.8	52.0	45.0	0.0	0.0
R03	52.0	45.0	28.6	28.6	52.0	45.0	0.0	0.0
R04	54.0	54	20.5	20.5	54.0	54.0	0.0	0.0
R05	54.0	54	34.3	34.3	54.0	54.0	0.0	0.0

All values are sound pressure levels in dBA re: 2 x 10^{-5} Pa.

As demonstrated in Table 5.3, the contribution of the proposed scheme at the closest receptors to the existing ambient noise levels is predicted to be +/-0, indicative of a negligible short-term impact as defined by the IEMA 2014 Guidelines for Environmental Noise Impact Assessment.

Given the additional context in relation to absolute noise levels and overall change in noise level, the outcome of the assessment has been identified as Low Impact.

6.0 Cumulative Effects

6.1 Assessment

The study area for potential cumulative effects has been selected by screening sites with mutual noise-sensitive receptors within a 500m radius of the site. Predicted noise levels proposed from the following cumulative site have been assessed:

- Proposed Energy Storage facility, related access, landscaping, infrastructure, ancillary equipment, with a grid connection import and export capacity of 57MWac (Application Reference Number C24/0532/25/LL).

The predicted specific noise level for the cumulative site have been taken from the noise impact assessment associated with Application Reference Number C24/0532/25/LL. Receptors R01, R03 to R05 fall outside of the study area, and therefore, cumulative noise levels are unlikely to give rise to significant effects.

Table 6.1: Cumulative Noise Level Assessment

Ref	Baseline + Proposed Development L_{Aeq}		Proposed L_{Aeq} C24/0532/25/LL		Cumulative L_{Aeq}		Cumulative Contribution dB	
	Daytime	Daytime	Daytime	Night-Time	Daytime	Night-Time	Daytime	Night-Time
R02	52.0	45.0	33.0	30.0	52.1	45.1	+0.1	+0.1
All values are sound pressure levels in dBA re: $2x\ 10^{-5}$ Pa.								

As demonstrated in Table 6.1, the absolute noise level at the closest receptors is predicted to change by up to +0.1dB, indicative of a negligible short-term impact as defined by the IEMA 2014 Guidelines for Environmental Noise Impact Assessment. As such, cumulative noise levels are unlikely to give rise to significant effects.

7.0 Conclusion

This report presents the findings of a noise assessment to support a planning application for an Energy Storage System (ESS) at Tyddyn Forgan.

BS4142:2014+A1:2019 Assessment

A BS 4142 assessment of the impact of the proposed development against existing background sound levels at the closest receptors has been undertaken. For the daytime and night-time periods, Rating Noise Levels are predicted to be below the existing background noise levels, which in accordance with BS 4142:2014 is considered to represent a low impact.

Noise Intrusion Assessment

A noise intrusion assessment has been carried out to predict noise from operations at the site upon receptors. Predicted daytime and night-time noise levels are below the BS 8233 daytime and night-time criteria of 35dB and 30 dB $L_{Aeq,T}$ respectively at all receptors.

Change in Noise Level Assessment

The contribution of the proposed scheme at the closest receptors is predicted to result in a +0.1dB change in the existing ambient noise levels, indicative of a negligible short-term impact.

Potential for cumulative effects has been considered, and it was identified that noise levels are unlikely to give rise to significant effects.

It has been predicted that on-site operational noise effects associated with the Development will not be significant and therefore the development will have a negligible impact in relation to noise.

Appendices

Appendix A – Acoustic Terminology

Acoustic Terminology

dB Sound levels from any source can be measured in frequency bands in order to provide detailed information about the spectral content of the noise, i.e. whether it is high-pitched, low-pitched, or with no distinct tonal character. These measurements are usually undertaken in octave or third octave frequency bands. If these values are summed logarithmically, a single dB figure is obtained. This is usually not very helpful as it simply describes the total amount of acoustic energy measured and does not take any account of the ear's ability to hear certain frequencies more readily than others.

dB(A) Instead, the dBA figure is used, as this is found to relate better to the loudness of the sound heard. The dBA figure is obtained by subtracting an appropriate correction, which represents the variation in the ear's ability to hear different frequencies, from the individual octave or third octave band values, before summing them logarithmically. As a result the single dBA value provides a good representation of how loud a sound is.

L_{Aeq} Since almost all sounds vary or fluctuate with time it is helpful, instead of having an instantaneous value to describe the noise event, to have an average of the total acoustic energy experienced over its duration. The $L_{Aeq,\ 07:00\ –\ 23:00}$ for example, describes the equivalent continuous noise level over the 16-hour period between 7 am and 11 pm. During this time period the L_{pA} at any particular time is likely to have been either greater or lower that the $L_{Aeq,\ 07:00\ –\ 23:00}$.

L_{Amin} The L_{Amin} is the quietest instantaneous noise level. This is usually the quietest 125 milliseconds measured during any given period of time.

L_{Amax} The L_{Amax} is the loudest instantaneous noise level. This is usually the loudest 125 milliseconds measured during any given period of time.

L_n Another method of describing, with a single value, a noise level which varies over a given time period is, instead of considering the average amount of acoustic energy, to consider the length of time for which a particular noise level is exceeded. If a level of x dBA is exceeded for say. 6 minutes within one hour, then that level can be described as being exceeded for 10% of the total measurement period. This is denoted as the $L_{A10,\ 1\ hr}$ = x dB.

The L_{A10} index is often used in the description of road traffic noise, whilst the L_{A90}, the noise level exceeded for 90% of the measurement period, is the usual descriptor for underlying background noise. L_{A1} and L_{Amax} are common descriptors of construction noise.

R_w The *weighted sound reduction index* determined using the above *measurement* procedure, but weighted in accordance with the procedures set down in BS EN ISO 717-1. Partitioning and building board manufacturers commonly use this index to describe the inherent sound insulation performance of their products.

Appendix B – References

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