

## Swansea BESS – Pre-Application Noise Assessment Technical Note

To: Swansea Council Environmental Health/Planning Departments      Client: Statkraft Ltd.

Address: Civic Centre, Oystermouth Road, Maritime Quarter, Swansea SA1 3SN      TNEI Reference: 17098-001-R2

Date: 15 January, 2025

### Introduction

Statkraft Ltd. (henceforth referred to as “the applicant”) are proposing a 100 MW Battery Energy Storage System (BESS) development (the Proposed Development) on land near to both the existing Swansea North 400 kV Substation and Statkraft’s already consented Greener Grid Park (GGP) Development (Swansea Council Planning Reference Number 2023/0889/FUL), which consists of Synchronous Compensator machinery referred to as “Energy Management” equipment. TNEI have been appointed by the applicant to undertake the noise impact assessment work in support of a future planning application for the Proposed Development. The Proposed Development will constitute a separate full planning application to the consented Swansea GGP development.

The purpose of this technical note is to summarise the pre-application noise assessment work already undertaken by TNEI in order to provide Swansea Council (SC) with a sufficient overview of any likely operational noise impacts. The note summarises elements such as the noise study area identified, noise propagation modelling assumptions and operational noise levels predicted at the nearest identified noise sensitive receptors (i.e. residential properties). The note also discusses the assessment methodology that will likely be applied to the full Noise Impact Assessment (NIA) report, specifically regarding appropriate noise assessment criteria.

### Project Summary

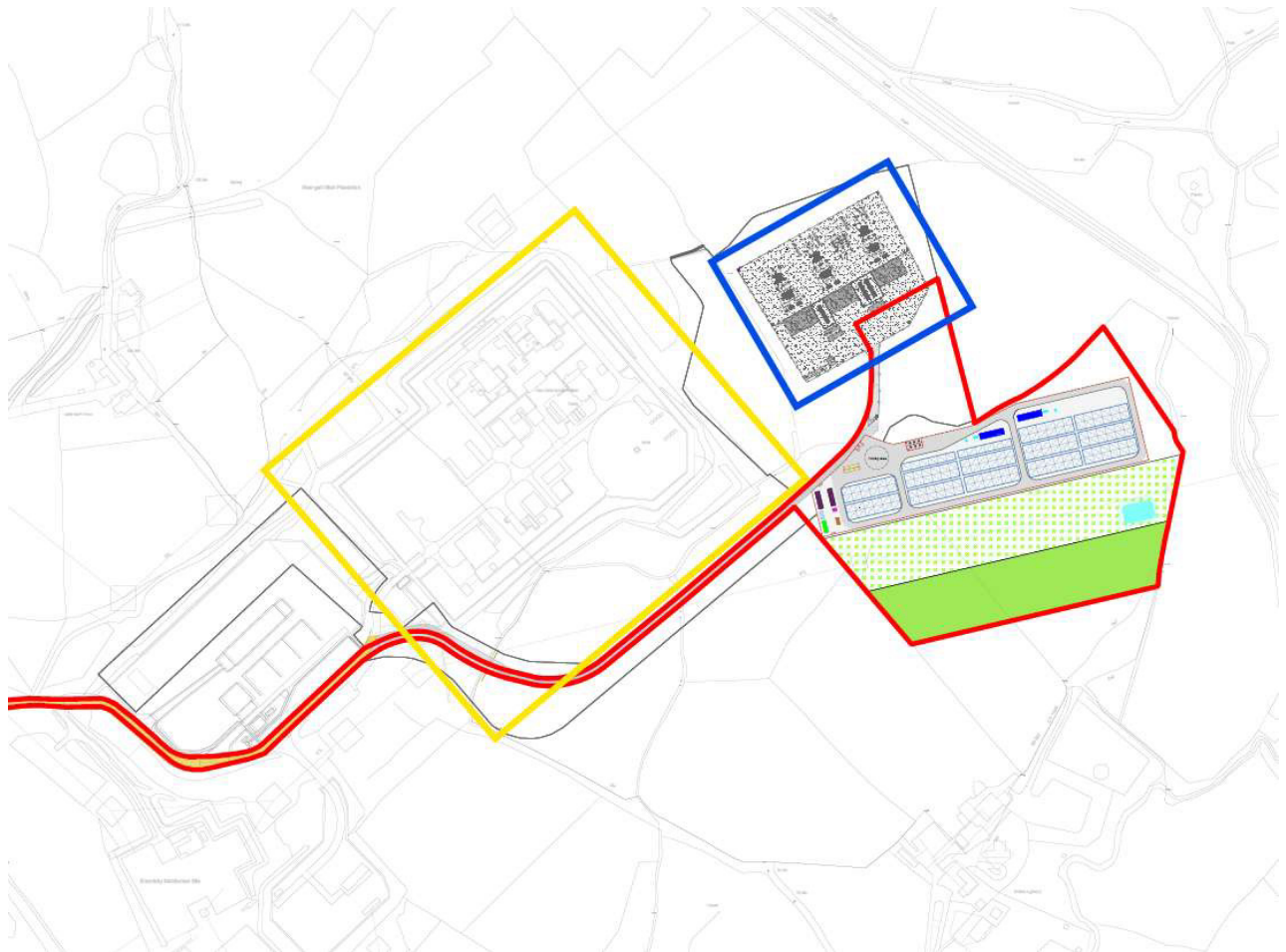
The Proposed Development is to be located approximately 1.5 km to the north of the M4 motorway, north of the City of Swansea, near to both the Swansea North 400 kV Substation and Statkraft’s Swansea GGP Development. The area surrounding the Proposed Development is predominantly rural in nature, however

there are a number of residential properties located nearby, the closest of which is approximately 270 m to the south.

Prior to the submission of a full Noise Impact Assessment (NIA) report as part of a future planning application submission, the applicant was keen to understand the viability of the Proposed Development at an early stage and as such commissioned TNEI to undertake a feasibility noise study, primarily consisting of operational noise propagation modelling.

At this early stage, exact details of the Proposed Development are still to be finalised. However, it is expected that the development will have a storage capacity of 100 MW and will include primary noise-emitting infrastructure such as containerised/modular battery storage units and Medium Voltage (MV) transformer/inverter power conversion units (PCU's). Additionally, it is expected that the Proposed Development will include ancillary infrastructure such as control containers, operations room, storage containers, welfare offices and auxiliary transformers. It is expected that the noise output from these ancillary items will be negligible and as such have not been included when undertaking noise predictions. The indicative site boundary and preliminary site layout used to inform the pre-app noise study is included within Appendix A. The latest iteration of the development site layout is shown below on Image 1 (Red), alongside indicative locations of the Swansea GGP development (Blue) and Swansea North 400 kV Substation (Yellow):

**Image 1 – Latest Indicative Site Boundary and Site Layout Drawing**



## Assessment Methodology/Noise Level Limits

Operational noise from developments of this nature is typically assessed in accordance with (the British Standard) BS 4142:2014 'Methods for Rating and Assessing Industrial and Commercial Sound' (henceforth referred to simply as BS 4142). BS 4142 assesses potential operational noise impacts upon residential receptors, the methodology of which is summarised below:

- Measure existing background sound levels at or close to the nearest Noise Sensitive Receptors (NSRs) for daytime and night-time periods;
- Predict the noise levels likely to be received at the NSRs from the development;
- Add penalties, as required, to account for the characteristics of the sound source to determine the Rating Level;
- Compare the Rating Level with the measured background sound levels to assess the likelihood of adverse impacts; and,
- If required, determine appropriate mitigation measures to reduce the Rating Level to within acceptable levels.

It is noted by TNEI that as part of the decision notice for the adjacent Swansea GGP development (2023/0889/FUL), the following BS 4142 related operational noise condition (Condition 17) was included:

*“When assessed in accordance with BS 4142:2014+A1:2019, the Rating Level of noise due to the Development when measured in the amenity areas of nearby dwellings, shall not exceed the levels specified in the table below:*

Receptor Name	Approximate Grid Reference	BS 4124 Rating Level, dB(A)	
		Daytime (0700-2300)	Night-time (2300-0700)
Abergelli Farm	265112, 201632	40	37
Abergelli (new build)	264949, 201486	42	41
Lletty'r Morfil Farm	264754, 201074	43	38
Maes-eglwys	265455, 200708	40	40

*Reason: To protect the residential amenity of the occupiers of nearby properties in the interests of the health and well-being.”*

TNEI have assumed the use of the above conditioned noise level limits to inform this initial noise study.

## Noise Propagation Modelling

All noise propagation modelling was undertaken in accordance with ISO 9613-2:2024 'Acoustics – Attenuation of sound during propagation outdoors' using the propriety noise modelling software, CadnaA. Noise propagation modelling was undertaken using the preliminary site layout plan provided by the applicant, which has since been superseded. The preliminary layout used will differ from the finalised layout that will be submitted as part of the planning application but is considered a good representation of the scale and

specifications of the Proposed Development in terms of numbers of items of noise emitting equipment. All items of plant have been modelled as area sources. **Error! Reference source not found.** below presents the candidate plant data assumed within the noise model:

**Table 1 –Summary of Plant Assumptions**

Item of Plant	Sound Power Level (dBA)	Number of Items of Plant Modelled
Modular BESS Unit	74	572
MV Transformer/Inverter Skid	86	26

### Noise Assessment Locations

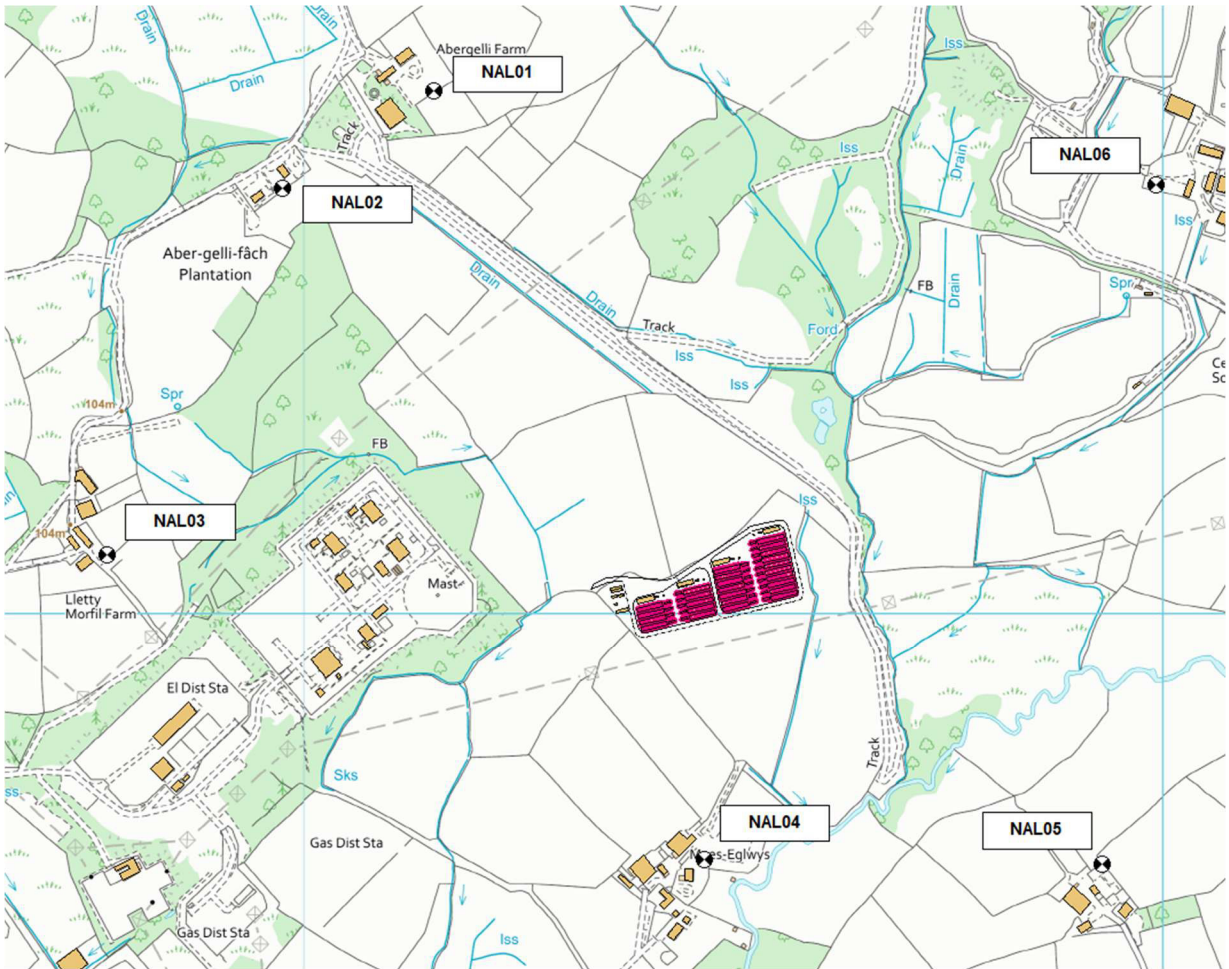
Noise Assessment Locations (NALs) are the exact points where noise predictions have been undertaken. The NALs were selected to represent the nearest Noise Sensitive Receptors (NSRs), i.e. residential properties, in the vicinity of the Proposed Development. For the most part, the NALs below are the same as those presented within the Swansea GGP noise condition, with the addition of NALs 05 and 06, which were identified by TNEI within the study area (further to the west) and have been included for completeness. As a worst-case scenario, the most stringent conditioned noise level limits for the Swansea GPP development (at Abergelli Farm) have been applied to NALs 05 and 06. Details for each NAL are presented in **Error! Reference source not found.** below:

**Table 2 - Noise Assessment Locations (NALs)**

Noise Assessment Locations (NALs)			
NAL ID	NAL Descriptor	Eastings	Northings
NAL01	Abergelli Farm	265151	201609
NAL02	Abergelli (New Build)	264975	201494
NAL03	Lletty'r Morfil Farm	264771	201067
NAL04	Maes-eglwys	265466	200713
NAL05	Rhyd-y-Pandy Road	265929	200708
NAL06	Cefn Betingau	265992	201499

The locations of the respective NALs in relation to the Proposed Development location are shown in Image 2 below (where the pink-coloured area represents the noise emitting elements of the Proposed Development and the black and white circles represent the exact assessment points):

Image 2 – Noise Assessment Locations (NALs)



### Noise Modelling/Assessment Results

The predicted levels are presented below and were calculated assuming all plant is operating continuously and concurrently with no operational differences between the daytime and night-time periods. For avoidance of doubt, the values presented below in **Error! Reference source not found.** are BS 4142 Rating Levels, not just the predicted Specific Noise Levels. This is an important distinction as the BS 4142 assessment process requires the consideration of the character of the sound, with any corrections (essentially penalties) being applied to the predicted noise levels to obtain a rating level. For the purposes of this assessment and using TNEI’s extensive experience of BS 4142 assessments for BESS developments, + 0 dB BS 4142 character correction is judged as applicable.

BS 4142 character corrections are often influenced by the plant specifications (i.e. noise source data), and as such the application of these corrections will be revised as part of the full noise impact assessment submitted to support the Proposed Development’s planning application when the design has been finalised. However, at the pre-app stage, no correction has been applied and as such the noise predicted levels equate to the BS 4142 Rating Levels.

For completeness, the BS 4142 Rating Levels presented within the Swansea GGP NIA Report<sup>1</sup> were logarithmically added to the Proposed Development’s Rating levels in order to obtain a Cumulative Rating

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<sup>1</sup> Authored by Wardell Armstrong, entitled “Statkraft, Swansea Greener Grid Park, Noise Assessment Report, April 2023”, Job number – ST19905, Report number – 001.



level. The Cumulative Rating Levels have been compared to the GGP noise level limits during the daytime and night-time periods. Rating Levels for the GGP were not presented within the GGP NIA report at three of the NALs included within TNEI’s assessment and as such, it is assumed that the GGP Rating Level at these locations is negligible (indicated with a dash below). Assessment results are provided below in **Error! Reference source not found.** and **Error! Reference source not found.** on this basis:

**Table 3 – Assessment Results (Daytime)**

NAL ID	Proposed Development Rating Level, dBA	Swansea GGP Rating Level, dBA	Cumulative Rating Level	Daytime Noise Level Limit, dBA	Margin, dB
NAL01	30	-	30	40	-10
NAL02	31	32	35	42	-7
NAL03	34	32	36	43	-7
NAL04	38	32	39	40	-1
NAL05	33	-	33	40	-7
NAL06	32	-	32	40	-8

**Table 4 – Assessment Results (Night-time)**

NAL ID	Proposed Development Rating Level, dBA	Swansea GGP Rating Level, dBA	Cumulative Rating Level	Night-time Noise Level Limit, dBA	Margin, dB
NAL01	30	-	30	37	-7
NAL02	31	32	35	41	-6
NAL03	34	32	36	38	-2
NAL04	38	32	39	40	-1
NAL05	33	-	33	37	-4
NAL06	32	-	32	37	-5

Considering the results presented above, at all NALs during both the daytime and night-time periods, the cumulative BS 4142 Rating Levels were found to be below the conditioned noise level limits assigned to the adjacent Swansea GGP development.

### Further Cumulative Considerations

The applicant acknowledges the presence of additional BESS schemes located in the surrounding area that may need to be considered as part of a cumulative noise assessment. However, given their premature status and that no formal planning applications have yet to be submitted to the LPA for these schemes, it is difficult to robustly assess for cumulative impacts. Within TNEI’s formal consultation letter that will be issued to Swansea Council prior to submission of the NIA report, we will highlight these schemes and propose which

of the schemes can realistically be included within the full Noise Impact Assessment in support of the proposed development.

### Summary and Recommendations

The purpose of this technical note was to summarise the pre-application noise assessment work undertaken to appraise potential operational noise impacts from a new proposed BESS development in Swansea. A noise propagation model was built to predicted operational noise levels at the nearest residential receptors using typical candidate data for a development of this nature. Incorporating the results of the nearby Swansea GGP development's noise impact assessment, the Cumulative BS 4142 Rating Levels have been assessed against the conditioned noise level limits already assigned to the GGP development. It was found that the Cumulative BS 4142 Rating Levels would be below these noise level limits at all nearby noise sensitive receptors during both the daytime and night-time periods. As such, it is anticipated that operational noise attributable to the Proposed Development is unlikely to result in an adverse impact when assessed against the existing noise level limits.

TNEI will be in touch in due course with the Swansea Council's Environmental Health and/or Planning departments to provide more detail regarding the proposed assessment methodology for the full Noise Impact Assessment that will be issued in support of the Proposed Development's planning application, including discussion regarding the application of the extant noise level limits and appropriate consideration of the wider cumulative noise situation.

For the time being, we hope the above provides you with a clear summary of the noise assessment work TNEI have undertaken so far to highlight potential noise impacts in view of a future planning application. If there is any aspect of the above that you would like to discuss in more detail in the meantime, please do not hesitate to get in touch.

Yours sincerely,



Ewan Watson  
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## Document Control

Revision	Status	Prepared by	Checked by	Approved by	Date
R0	FIRST ISSUE	EW	MC	MC	10/01/2025
R1	CLIENT COMMENTS	EW	MC	MC	14/01/2025
R2	CLIENT COMMENTS	EW	MC	MC	15/01/2025

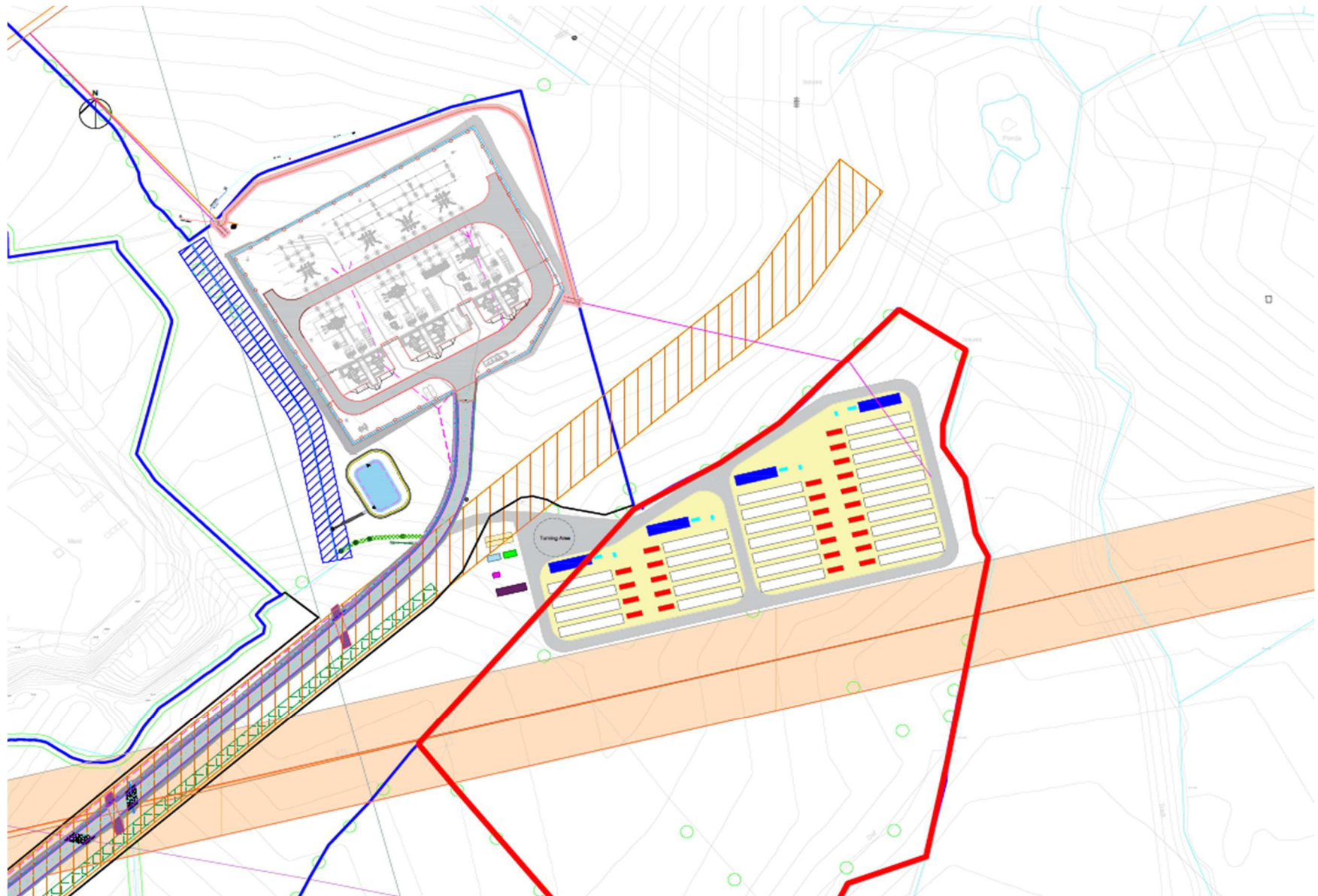
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## Appendix A – Preliminary Site Layout Used to Inform Pre-App Noise Modelling





A specialist energy consultancy

## Swansea Battery Energy Storage System (BESS) Development: Noise Impact Assessment Methodology – EHO Consultation

To: Swansea Council Environmental Health Department      Client: Statkraft Ltd.

Address: Civic Centre, Oystermouth Road, Maritime Quarter, Swansea SA1 3SN      TNEI Reference: 17098-002-R1

Date: 23 January, 2025

### Introduction

Dear Sir/Madam,

TNEI Services Ltd (TNEI) have been commissioned by Statkraft Ltd. (the applicant) to carry out a Noise Impact Assessment (NIA) to support the planning application for the proposed Swansea Battery Energy Storage System (BESS) development (the Proposed Development). The Proposed Development is to be located adjacent to the Swansea North 400 kV Substation and Statkraft's already consented Greener Grid Park (GGP) Development (Swansea Council Planning Reference Number 2023/0889/FUL).

As part of the pre-application documentation submitted to Swansea Council (SC) by the applicant's planning consultant, DWD, TNEI provided a technical note (document reference 17098-001-R0, dated 15<sup>th</sup> of January 2025), which summarised the feasibility noise assessment work undertaken by TNEI, investigating the viability of the scheme in terms of likely noise impacts on surrounding receptors. Within the note, TNEI present the results of early-stage noise propagation modelling assessed against the extant conditioned noise level limits applicable to the neighbouring GGP development (Condition 17 of 2023/0889/FUL Decision Notice). The early-stage noise modelling exercise showed that noise levels (both from the Proposed Development alone, and cumulatively when including the GGP's operational noise output) were below the extant GGP noise level limits.

The purpose of this letter is to seek to agree upon the use of the extant noise level limits to inform the full Noise Impact Assessment (NIA) report that will be submitted in support of the Proposed Development's planning application, as well as to discuss potential further cumulative considerations that may be required.

## BS 4142 and Extant Swansea GGP Noise Level Limits

Operational noise from developments of this nature is typically assessed in accordance with (the British Standard) BS 4142:2014 'Methods for Rating and Assessing Industrial and Commercial Sound' (henceforth referred to simply as BS 4142). BS 4142 assesses potential operational noise impacts upon residential receptors, the general methodology of which is summarised below:

- Measure existing background sound levels at or close to the nearest Noise Sensitive Receptors (NSRs) for daytime and night-time periods;
- Predict the noise levels likely to be received at the NSRs from the development;
- Add penalties, as required, to account for the characteristics of the sound source to determine the Rating Level;
- Compare the Rating Level with the measured background sound levels to assess the likelihood of adverse impacts; and,
- If required, determine appropriate mitigation measures to reduce the Rating Level to within acceptable levels.

It is noted by TNEI that as part of the decision notice for the adjacent Swansea GGP development (2023/0889/FUL), the following BS 4142 related operational noise condition (Condition 17) was included:

*"When assessed in accordance with BS 4142:2014+A1:2019, the Rating Level of noise due to the Development when measured in the amenity areas of nearby dwellings, shall not exceed the levels specified in the table below:*

Receptor Name	Approximate Grid Reference	BS 4142 Rating Level, dB(A)	
		Daytime (0700-2300)	Night-time (2300-0700)
Abergelli Farm	265112, 201632	40	37
Abergelli (new build)	264949, 201486	42	41
Lletty'r Morfil Farm	264754, 201074	43	38
Maes-eglwys	265455, 200708	40	40

*Reason: To protect the residential amenity of the occupiers of nearby properties in the interests of the health and well-being."*

As mentioned above, TNEI have used the conditioned noise level limits to inform the initial noise study and have demonstrated that both site specific and cumulative BS 4142 Rating Levels are likely to meet the conditioned limits at all identified receptors. This assessment outcome will be subject to change when accounting for the finalised planning layout in the planning application NIA but is a good indication of the scheme's operational noise impact, nonetheless.

As part of TNEI's pre-application study, we have identified two further noise sensitive receptors (NSRs) within the relevant study area that are not included within the above noise condition but will need to be included as part of TNEI's NIA report. They are shown as NSRs 05 and 06 in the Table 1 and Figure 1 below:



**Table 1: Nearest Noise Sensitive Receptors (NSRs) Identified by TNEI**

Noise Sensitive Receptor (NSR) Name	Approximate Grid Reference
NSR01 - Abergelli Farm	265112, 201632
NSR02 - Abergelli (new build)	264949, 201486
NSR03 - Lletty'r Morfil Farm	264754, 201074
NSR04 - Maes-eglwys	265455, 200708
<b>NSR05 - Rhyd-y-Pandy Road</b>	<b>265952, 200656</b>
<b>NSR06 - Cefn Betingau</b>	<b>266029, 201493</b>

**Figure 1 – Nearest Noise Sensitive Receptors (NSRs) and Indicative Site Location**



In the absence of already assigned limits at these newly identified receptors, TNEI propose that the adoption of the most stringent noise level limits issued as part of the GGP development noise condition (i.e. the lowest levels, applicable to Abergelli Farm) would offer appropriate protection from potential noise impacts.

With consideration of the above, TNEI propose that BS 4142 Rating Levels contained within Table 2 should be adopted as the target noise assessment criteria to inform the Proposed Development's NIA report:

**Table 2: Proposed Target BS 4142 Rating Levels to Inform Swansea BESS NIA**

Receptor Name	Approximate Grid Reference	BS 4124 Rating Level, dB(A)	
		Daytime (0700-2300)	Night-time (2300-0700)
Abergelli Farm	265112, 201632	40	37
Abergelli (new build)	264949, 201486	42	41
Lletty'r Morfil Farm	264754, 201074	43	38
Maes-eglwys	265455, 200708	40	40
NSR05 - Rhyd-y-Pandy Road	265952, 200656	40	37
NSR06 - Cefn Betingau	266029, 201493	40	37

### Cumulative Considerations and Assessment Approach

The applicant has informed TNEI that in addition to the already considered Swansea GGP development, there are a number of operational or proposed renewable energy/electrical infrastructure schemes within the area surrounding the Proposed Development that may require cumulative consideration within our assessment. Table 3 summarises the developments that we intend to include within our assessment that have been identified near to the Proposed Development.

**Table 3: Neighbouring Schemes to the Proposed Development**

Neighbouring Scheme	Swansea Council Planning Reference Number	Planning Status
Swansea Greener Grid Park (GGP)	2023/0889/FUL	Consented
Swansea North 400 kV Substation	2008/1685	Operational
Afon Llan Solar Park	2020/0257/FUL	Operational
Cefn Betingau Solar Park	2013/0865	Operational
Brynwhilach Solar Park	2014/1022	Operational

Our cumulative assessment will consider the likely cumulative noise levels from the operation of all of the above developments, **but only in instances where the requisite noise assessment**

**report/information is publicly available to allow us to do so**<sup>1</sup>. Where developments have either no associated noise impact assessment (or are not publicly available) or are at such an early stage that this has not yet been considered, we cannot reasonably include this within the assessment and will therefore be scoped out.

For the cumulative schemes that can be included within the assessment, TNEI will seek to demonstrate that the cumulative noise level from all schemes will either not exceed the target noise levels proposed at each NSR, or in instances where cumulative schemes are already exceeding the target noise levels (if applicable), demonstrate that the site-specific noise levels from the Proposed Development will be at least 10 dB below the cumulative noise level of the neighbouring developments therefore contributing a negligible amount to the cumulative level. For clarity, whilst we do agree that the investigation of likely cumulative noise effects is an important consideration, **TNEI do not believe that a cumulative noise condition is appropriate** and would expect that any noise limits that are imposed upon the Proposed Development should it be granted consent would be site specific only.

### Summary

We hope the above provides you with requisite information to allow us to agree upon an appropriate noise impact assessment methodology and progress with the assessment in due course. Specifically, we would request feedback on the following:

- Do you agree with the use and application of BS 4142?
- Do you agree with the target BS 4142 Rating Levels set out in Table 2?
- Can you confirm that you are happy with the list of identified cumulative schemes and provide details of any other schemes that you want to be considered?

We would welcome any additional feedback you may have on the above, particularly with regards to the adoption of the extant noise level limits and proposed cumulative approach. If you feel that a call would be beneficial to discuss matters further, please do not hesitate to get in touch and we can look to arrange this.

Yours sincerely,



Ewan Watson

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Principal Consultant

TNEI Services Ltd

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<sup>1</sup> This builds on the assumption that if a noise assessment was not submitted with the planning application, then SC were satisfied that noise emissions were negligible and therefore did not require an assessment.



## Document Control

Revision	Status	Prepared by	Checked by	Approved by	Date
R0	FINAL ISSUE	EW	JM	JM	17/01/2025
R1	CLIENT COMMENTS	EW	JM	JM	23/01/2025

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