

# Preliminary Environmental Information Report

## Chapter 13: Noise and Vibration

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Future Energy Llanwern Limited

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# 13.0 Noise and Vibration

## 13.1 Introduction

13.1.1 This Chapter presents the preliminary results of the assessment of the likely significant effects of the Proposed Development to human receptors with respect to noise and vibration.

13.1.2 The Proposed Development will be constructed on agricultural land between the villages of Redwick and Undy within the administrative areas of Monmouthshire County Council and Newport City Council. A description of the Proposed Development is provided in **Chapter 2: Description of the Proposed Development**. Effects from noise and vibration on ecological receptors is covered in **Chapter 8: Ecology** and **Chapter 9: Ornithology**.

13.1.3 This Chapter describes:

- The legislation, policy and technical guidance that has informed the assessment (**Section 13.2**);
- Limitations and assumptions (**Section 13.3**);
- Stakeholder Engagement (**Section 13.4**);
- Description of the methodology underpinning the transport assessment (**Section 13.5**);
- Description of the Study Area (**Section 13.5**);
- Identification of the potential sensitive receptors within the vicinity of the Site (**Section 13.5**);
- Description of the EIA Significance Criteria (**Section 13.6**);
- Description of the baseline conditions (**Section 13.7**);
- Embedded Design Mitigation (**Section 13.8**);
- Assessment of likely impacts and effects (**Section 13.9**);
- Additional mitigation and enhancement measures (**Section 13.10**);

- A summary of significant residual effects and conclusions (**Section 13.11**);
- A summary of significant cumulative effects (**Section 13.12**);
- Summary and next steps (**Section 13.13**); and
- References (**Section 13.14**).

13.1.4 The appendices in **Table 13-1** below also accompany this assessment.

*Table 13-1 Appendices which informed the Noise assessment*

Drawing number / Document reference	Drawing description
<b>Appendix 13A</b>	Assessment Data
<b>Appendix 13B</b>	Baseline Noise Monitoring

13.1.5 The figure in **Table 13-2** below also accompany this assessment.

*Table 13-2 Figures which informed the Noise assessment*

Drawing number / Document reference	Drawing description
<b>Figure 13-1</b>	Noise and Vibration Study Areas, Receptors and Noise Monitoring Locations.

## 13.2 Legislation and Planning Policy

13.2.1 The noise and vibration assessment has been prepared in accordance with the following legislation and policy presented in **Table 13-3**.

*Table 13-3 Legislation and policy relevant to Noise and Vibration*

Policy	Context
<b>Control of Pollution Act 1974 (CoPA) (Ref 13-1)</b>	The CoPA makes provision for the agreement of noise levels and methods of working with Local Authorities such that working in accordance with the agreement is a defence against any prosecution under the Act. The Act established the concept of “Best Practicable Means” (BPM) as a defence against prosecution under the Act. The Act also enables the preparation of approved codes of practice (COP) for various sources.

Policy	Context
<p><b>Environmental Protection Act 1990 (EPA) (Ref 13-2)</b></p>	<p>The EPA further establishes the BPM defence. The Act also establishes that noise from premises and also individual vehicles on the public highways can be a statutory nuisance if they are a nuisance or prejudicial to health. The Act also clarifies that noise from road traffic on the public highway is not a nuisance.</p> <p>Road traffic is different to the ‘individual vehicle’ considered above as road traffic consists of a mixture of numerous vehicles originating from, and travelling to, different locations, and is therefore ‘anonymous’, i.e. sound from road traffic cannot be attributed to any one particular construction site or operational facility. Conversely, an individual vehicle may be identifiable and associated with, for example, a specific commercial or industrial operation.</p>
<p><b>National Policy Statements EN-1 (Ref 13-3)</b></p>	<p>NPS EN-1 (Ref 13-3) advises that applicants include a noise assessment to consider both construction and operation effects where appropriate. Reference is made to Welsh Government’s overarching noise policy set out in ‘Noise and Soundscape Action Plan 2018 to 2023’ (Ref 13-4).</p>
<p><b>National Policy Statements EN-3 (Ref 13-5)</b></p>	<p>NPS EN-3 (Ref 13-5) advises that proposals for renewable energy infrastructure should demonstrate good design, particularly in respect of the inclusion of any necessary mitigation to avoid noise effects.</p> <p>With regard to solar schemes, it is noted that care should be taken to avoid cumulative effects where the network connection is sited next to existing electricity network infrastructure and that worst-case impacts due to construction traffic on potential construction traffic routes should be assessed. The potential for impacts due to road noise from construction traffic during the construction phase will be assessed as set out in <b>Section 13.6</b>.</p> <p>The potential for cumulative noise effects due to additional plant required for the network connection and noise from existing</p>

Policy	Context
	<p>electricity network infrastructure is addressed in the proposed methodology for assessing operational noise. The methodology of assessing operational noise, is that provided in BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound (Ref 13-6) (BS 4142). The methods provided in BS 4142 address the potential for cumulative noise effects through determination of existing baseline conditions and consideration of context, including consideration of the level and character of the specific sound (i.e. noise from any new or additional plant) in relation to the level and character of the residual sound (i.e. the existing ambient sound before the addition of the specific sound, including the extent of any pre-existing impacts and the potential for these to increase with the addition of the specific sound). The potential for impacts due to operational noise from operational plant and equipment will be assessed as set out in <b>Section 13.6</b>.</p>
<p><b>Planning Policy Wales (PPW) Edition 12 (Ref 13-7)</b></p>	<p>PPW (Ref 13-7) sets out the land use planning policies of the Welsh Government, supplemented by Technical Advice Notes (TANs). PPW sets out the importance of fully considering potential noise impacts from new energy infrastructure when making planning decisions (Paragraph 6.7.3). Guidance around soundscapes promote a holistic approach to achieving well-being goals by considering the context of the sound in a given environment, and not just the absolute level of a sound.</p>
<p><b>Future Wales: The National Plan 2040 (Ref 13-8)</b></p>	<p>Future Wales is the national development framework for Wales and has development plan status.</p> <p>Policies 17 and 18 relate to renewable energy development.</p> <p><i>“Policy 17 – Renewable and Low Carbon Energy and Associated Infrastructure</i></p> <p><i>The Welsh Government strongly supports the principle of developing renewable and low carbon energy from all</i></p>

**Policy**

**Context**

*technologies and at all scales to meet our future energy needs.*

*In determining planning applications for renewable and low carbon energy development, decision-makers must give significant weight to the need to meet Wales’ international commitments and our target to generate 70% of consumed electricity by renewable means by 2030 in order to combat the climate emergency.*

...

*Applications for large-scale wind and solar will not be permitted in National Parks and Areas of Outstanding Natural Beauty and all proposals should demonstrate that they will not have an unacceptable adverse impact on the environment. ...*

*The Welsh Government will work with stakeholders, including National Grid and Distribution Network Operators, to transition to a multi-vector grid network and reduce the barriers to the implementation of new grid infrastructure.”*

*“Policy 18 – Renewable and Low Carbon Energy Developments of National Significance*

*Proposals for renewable and low carbon energy projects (including repowering) qualifying as Developments of National Significance will be permitted subject to policy 17 and the following criteria:*

...

*7. there are no unacceptable adverse impacts by way of shadow flicker, noise, reflected light, air quality or electromagnetic disturbance; ...*

*11. there are acceptable provisions relating to the*

Policy	Context
	<p><i>decommissioning of the development at the end of its lifetime, including the removal of infrastructure and effective restoration.</i></p> <p><i>The cumulative impacts of existing and consented renewable energy schemes should also be considered.”</i></p>
<p><b>Welsh Assembly Government: Technical Advice Note (TAN) 11: Noise (1997) (Ref 13-9)</b></p>	<p>TAN 11 provides general advice on noise and, with regard to industrial development, refers to British Standard (BS) BS 4142:1997 Method for rating industrial noise affecting mixed residential and industrial areas (now superseded, the current version has been used in this assessment) and BS 8233:2014 Guidance on sound insulation and noise reduction for buildings (Ref 13-10); and with regard to construction noise: BS 5228:2009+A1:2014 Noise and vibration on construction and open sites. Part 1: Noise (Ref 13-11) and BS 5228-2:2009+A1:2014 Noise and vibration on construction and open sites. Part 2: Vibration (Ref 13-12).</p>
<p><b>Noise and Soundscape action Plan for Wales 2018 – 2023 (Ref 13-13)</b></p>	<p>This document sets out the noise action plan for Wales and the national strategy on soundscapes. It is noted that soundscape analysis is an emerging field, but the importance of the context of sound and the environment in which it is perceived is recognised, in addition to absolute sound levels. Whilst reference is made to World Health Organisation (WHO) research indicating health impacts in terms of healthy life years lost due to noise effects, the impact of noise in inappropriate settings is emphasised: <i>‘...it could spoil people’s appreciation of the beauty and tranquillity of nature if experienced at the top of a mountain or in the middle of a national park’.</i></p> <p>There is an updated draft of this document ‘Noise and Soundscape Plan for Wales 2023 – 2028 (Consultation draft)’ (Ref 13-14) which contains guidance on assessing sensitivity of different receptors which has been referred to when undertaking the assessment.</p>

Policy	Context
<p><b>Monmouthshire County Council Adopted Local Development Plan 2011-2021(Ref 13-15)</b></p>	<p>The adopted Local Development Plan (LDP) provides policies to guide appropriate development in the administrative area of Monmouthshire County Council.</p> <p>Policy SD1 – Renewable Energy, clause 3, refers specifically to avoiding unacceptable impacts to the amenity of nearby residents due to noise:</p> <p><i>“Renewable energy schemes will be permitted where:</i></p> <p><i>(1) There are no unacceptable adverse impacts upon the landscape, townscape and historic features and there is compliance with Policy LC5, with regard to protection and enhancement of landscape character;</i></p> <p><i>(2) There are no unacceptable adverse impacts on biodiversity;</i></p> <p><i>(3) There are no unacceptable adverse impacts on the amenities of nearby residents by way of noise, dust, odour or increases in traffic;</i></p> <p><i>(4) The wider environmental, economic, social and community benefits directly related to the scheme outweigh any potentially adverse impacts; and</i></p> <p><i>(5) The distinct identity of Monmouthshire will not be compromised.</i></p> <p><i>For all types of renewable energy, cumulative impacts will be an important consideration where there are other renewable energy schemes currently operating in the area.</i></p> <p><i>When the technology is no longer operational there is a requirement to decommission, remove the facility and complete a restoration of the site to its original condition.”</i></p>

Policy	Context
<p><b>Newport Local Development Plan 2011 – 26 (Ref 13-16)</b></p>	<p>The adopted LDP provides policies to guide appropriate development in the administrative area of Newport City Council. Policy GP2, clause i, states that new development will be permitted where there are no significant adverse effects on local amenity due to noise:</p> <p><i>“GP2 General Development Principles – General Amenity</i></p> <p><i>Development will be permitted where, as applicable:</i></p> <p><i>i) there will not be a significant adverse effect on local amenity, including in terms of noise, disturbance, privacy, overbearing, light, odours and air quality; ...”</i></p> <p>Policy GP4, clause iii, sets out the principle of good design that new development should be laid out in a way to minimise noise pollution:</p> <p><i>“GP6 General Development Principles – Quality of Design</i></p> <p><i>Good quality design will be sought in all forms of development. the aim is to create a safe, accessible, attractive and convenient environment. in considering development proposals the following fundamental design principles should be addressed:</i></p> <p><i>i) context of the site: all development should be sensitive to the unique qualities of the site and respond positively to the character of the area;</i></p> <p><i>ii) access, permeability and layout: all development should maintain a high level of pedestrian access, connectivity and laid out so as to minimise noise pollution; ...”</i></p> <p>Policy GP7 - General Development Principles – Environmental Protection and Public Health states that development will not be permitted <i>“which would cause or result in unacceptable harm to health because of ... noise ...”</i></p>

## Technical Guidance Relevant to Noise and Vibration

13.2.2 The Noise assessment has been prepared in accordance with the following guidance and standards as presented in **Table 13-4**.

*Table 13-4 Guidance and standards relevant to noise and vibration*

Technical Guidance	Context
<b>IEMA Guidelines for environmental noise impact assessment (Ref 13-16)</b>	The IEMA Guidelines contain guidance on undertaking an Environmental Impact Assessment (EIA) for noise, including guidance on criteria for ambient noise changes.
<b>Calculation of Road Traffic Noise (CRTN) (Ref 13-17)</b>	CRTN describes the procedures for calculating road traffic noise.
<b>Design Manual for Roads and Bridges (DMRB) LA111: Noise and vibration (Ref 13-18)</b>	DMRB LA111 provides guidance on the assessment of impacts that road projects may have on levels of noise and vibration. It provides criteria for assessing changes in road traffic noise levels, which will be used in the assessment of increases in road traffic noise due to vehicle movements associated with the construction phase of the Proposed Development.
<b>ISO 9613-2:2024 Acoustics – Attenuation of sound during propagation outdoors: Part 2 Engineering method for the prediction of sound pressure levels outdoors (Ref 13-20)</b>	ISO 9613-2:2024 sets out a method for calculating the attenuation of sound outdoors to predict environmental noise levels.
<b>BS 5228-1:2009+A1:2014 Noise and vibration on construction and open sites. Part 1: Noise (Ref 13-11)</b>	BS 5228-1 provides a recommended scope for construction noise assessment (the ABC Method) as presented in Annex E. The ABC Method relies on determining threshold values for potential significant effects at noise sensitive receptors based upon the results of ambient sound monitoring.

Technical Guidance	Context
<b>BS 5228-2:2009+A1:2014</b> <b>Noise and vibration on construction and open sites. Part 2: Vibration (Ref 13-12)</b>	BS 5228-2 provides methods and criteria for assessing ground borne vibration, which may be used when considering the potential for significant effects due to construction vibration.
<b>BS 4142:2014+A1:2019</b> <b>Methods for rating and assessing industrial and commercial sound (Ref 13-6)</b>	BS 4142 is the British Standard that sets out methods for determining the magnitude of impact of operational noise.
<b>BS 7445 – Description and Measurement of Environmental Noise (Ref 13-21)</b>	BS 7445 sets out general methods for carrying out, and reporting of, environmental noise surveying.

### 13.3 Assessment Assumptions and Limitations

13.3.1 To ensure transparency within the EIA process, the following limitations and assumptions have been identified.

13.3.2 There is currently limited information available on:

- Construction traffic flow data; and
- Construction activities.

13.3.3 To address the limitations identified above, the following approaches have been taken.

13.3.4 The assessment of potential increases in road traffic noise during the construction phase will be undertaken and presented in the Environmental Statement (ES).

13.3.5 For the assessment of construction phase noise and vibration arising from construction activities, assumptions have been made on likely plant requirements, and a preliminary assessment has been undertaken. The assumptions on construction plant requirements are set out in **Appendix 13A**. The intensity of works

during the construction phase have been inferred by a review of the draft construction programme, and based on professional experience of undertaking assessments of potential noise impacts due to construction of similar schemes.

13.3.6 In any case, construction noise and vibration emissions and associated effects during the construction phase will be controlled by a detailed Construction Environmental Management Plan (CEMP) which will be produced by the appointed construction contractor following the making of the DCO and prior to the start of construction (for example, as part of a Requirement of the DCO). An outline CEMP (oCEMP) (**Appendix 2A**) has been produced to support this PEIR. An oCEMP which will be updated following appointment of a construction contractor and prior to commencement of construction, will be provided with the ES.

## 13.4 Stakeholder Engagement

13.4.1 An EIA Scoping Report (**Appendix 1C**) for the Proposed Development and a request for an EIA Scoping Opinion from the Planning Inspectorate was submitted in December 2024. **Table 13-5** and **Table 13-6** presents a summary of comments provided by the Planning Inspectorate and consultees (**Appendix 1D**) as part of the scoping process and the Applicant’s response, highlighting where relevant how these comments have been addressed within this Chapter.

*Table 13-5 Main Matters Raised during Consultation*

Consultee	Main matter raised	How has the concern been addressed	Location of response
<b>Planning Inspectorate</b>	PINS agreed that vibration from road traffic can be scoped out and requested that the ES should confirm the vehicle types and numbers for all phases of the	The ES will set out the types and number of vehicle movements expected during the operational phase and construction phase of the Proposed Development.	Vehicle types and numbers expected during the operational phase and construction phase of the Proposed Development will be reported in ES

Consultee	Main matter raised	How has the concern been addressed	Location of response
	development (with reference to thresholds within guidance) to justify this position.	We are not aware of any relevant thresholds in guidance with respect to vehicle types and numbers and induced vibration.	<b>Chapter 15 Transport and Access.</b>
<b>Planning Inspectorate</b>	PINS agreed that operational vibration is scoped out and requested that the ES should demonstrate that operational plant and equipment is of a type and to be used in locations unlikely to result in significant vibration impacts on sensitive receptors.	Information has been received from the Applicant describing the plant and equipment proposed as part of the Proposed Development. The information indicates that there is no significant rotating machinery proposed, and hence there are no significant sources of operational vibration proposed in close proximity, or otherwise, to any nearby receptors.	Descriptions of the plant and equipment proposed as part of the Proposed Development are provided in <b>Chapter 2 Description of the Proposed Development.</b>
<b>Planning Inspectorate</b>	Justification should be provided for the extents of Study Areas with reference to the	Study Areas have been defined in accordance with relevant guidance. Key receptor locations	The definition of Study Areas, and justification for selection of Study Area extents, are

Consultee	Main matter raised	How has the concern been addressed	Location of response
	extent of likely effects, supported by relevant evidence such as details of the plant and machinery, noise modelling results or relevant guidance.	within the Study Areas, which are closest to proposed sources of construction noise and vibration and operational noise, have been identified and considered in the assessment.	provided in <b>Section 13.5</b> .
<b>Planning Inspectorate</b>	Explanation should be provided on how baseline monitoring locations were chosen and the locations should be agreed with the relevant consultees.	Baseline monitoring locations were initially identified to yield a conservative assessment, by being representative of receptors where baseline sound levels were considered likely to be lower and where receptors would be in closest proximity to proposed sources of noise and vibration associated with the construction and operation of the Proposed Scheme. The proposed monitoring locations were modified where	Descriptions of the baseline monitoring locations are provided in <b>Appendix 13B</b> and are identified in <b>Figure 13-1</b> .  Engagement with the relevant authorities to agree the baseline monitoring locations is described in this table, below, under the heading ' <b>Further Stakeholder Engagement after Scoping Opinion</b> '.

Consultee	Main matter raised	How has the concern been addressed	Location of response
		access to locations initially proposed could not be agreed. All monitoring locations were agreed in advance with relevant consultees.	
<b>Monmouthshire County Council Environmental Health</b>	The request of a noise impact assessment, with operational noise assessed in accordance with BS 4142, making recommendations for mitigation where necessary for the construction phase and operational phase. Requested submission of a CEMP.	A preliminary assessment of noise effects due to the Proposed Development has been undertaken. The complete assessment of noise effects due to the Proposed Development will be presented in the ES. A oCEMP has been prepared to support this PEIR. An oCEMP will be submitted with the ES.	The preliminary assessment of noise effects due to the Proposed Development is presented in <b>Section 13.10</b> and initial recommendations for mitigation likely to be required are presented in <b>Section 13.11</b> .
<b>The Planning Inspectorate</b>	The ES should consider whether any ecological receptors require consideration in respect of noise and	Potentially significant noise and vibration effects to ecological receptors have been considered in the PEIR.	Potentially significant noise and vibration effects to ecological receptors are addressed in <b>Chapter 8 Ecology</b>

Consultee	Main matter raised	How has the concern been addressed	Location of response
	vibration related impacts.		and <b>Chapter 9 Ornithology</b> .
<b>National Highways</b>	Adverse changes to noise should be considered.	An assessment of potential increases in road traffic noise during the construction phase will be undertaken and presented in the Environmental Statement (ES).	As noted in <b>Section 13.3</b> , there is currently insufficient data to complete the assessment of road traffic noise. The methodology that will be implemented to assess road traffic noise during the construction phase is set out in <b>Section 13.6</b> .

Table 13-6 Stakeholder Engagement after Scoping Opinion

Consultee	Main matter raised	How has the concern been addressed	Location of response
<b>Newport City Council</b>	Newport City Council were contacted by email on 15 January 2025. Survey methodology and locations were then discussed over email with an Newport City Council Environmental Health Officer (EHO).	The comments on survey methodology and locations were addressed and agreed with Newport City Council.	The survey methodology and details of the monitoring are provided in <b>Appendix 13B</b>
<b>Newport City Council</b>	Newport City Council were contacted by email on 19 June 2025. Amendments to survey locations were then discussed over email with an Newport City Council EHO.	The amended locations were agreed with Newport City Council.	The survey methodology and details of the monitoring are provided in <b>Appendix 13B</b>
<b>Monmouthshire County Council</b>	Monmouthshire County Council were contacted by email on 08 January	The comments on survey methodology and locations were addressed and	The survey methodology and details of the monitoring are

Consultee	Main matter raised	How has the concern been addressed	Location of response
	2025. Survey methodology and locations were then discussed over email with Monmouthshire County Council EHO.	agreed with Monmouthshire County Council.	provided in <b>Appendix 13B</b>

## 13.5 Assessment Methodology

### Scope of the Assessment

13.5.1 The scope of this assessment has been established through an ongoing scoping process. Further information can be found in **Chapter 5: Environmental Impact Assessment (EIA) Methodology**. **Table 13-7** refines the scope of the assessment, following consultation with the Planning Inspectorate, and provides the evidence base for scoping in and out elements of the assessment.

*Table 13-7: Elements scoped in or out of the socio-economics, tourism and recreation assessment*

Element	Phase	Scoped In	Scoped Out	Justification
<b>Construction activity noise</b>	Construction	✓		There is currently insufficient information available to determine that noise from construction activities will not give rise to likely significant effects.
<b>Construction activity vibration</b>	Construction	✓		There is currently insufficient information available to determine that vibration from construction

Element	Phase	Scoped In	Scoped Out	Justification
				activities will not give rise to likely significant effects.
<b>Construction road traffic noise</b>	Construction	✓		There is currently insufficient information available to determine that noise from construction road traffic would not give rise to likely significant effects.
<b>Construction road traffic groundborne vibration</b>	Construction		✓	Groundborne vibration from road traffic is scoped out, as set out in <b>Table 13-3</b> , because there is no methodology available for predicting and assessing it. Groundborne vibration from road traffic is primarily due to irregularities in the road surface which is not within the control of the Applicant. Irregularities in the road surface should be minimised through normal maintenance overseen by the Highway Authority.
<b>Operational noise</b>	Operation	✓		There is currently insufficient information available to determine that operational noise would not give rise to likely significant effects.
<b>Operational vibration</b>	Operation		✓	The operational plant would not give rise to groundborne vibration and there is therefore no potential for likely significant effects due to operational vibration.

## Study Area

- 13.5.2 The Study Areas have been defined for each aspect of the Proposed Development requiring assessment. Determination of the extent of the Study Areas is based on appropriate guidance, where available, and professional judgement has been applied where there is a lack of specific guidance on the determination of Study Areas (e.g. there is no specific guidance on determination of study areas for operational noise).
- 13.5.3 In general, the closest sensitive receptors to proposed construction activities and operational plant, which fall within the respective Study Areas, will be the focus of the assessment. This is on the basis that ensuring appropriate control of noise and vibration at the closest receptors will result in receptors at a greater distance being subject to effects of a lesser (or the same) magnitude. However, where necessary, the Study Areas may be expanded, or additional receptors within the study area considered, where sensitive receptors are found to be subject to likely significant effects due to noise or vibration.
- 13.5.4 The Study Areas for each aspect are listed below and are shown in **Figure 13-1**.

### Construction noise

- 13.5.5 DMRB LA 111 (Ref 13-22) notes, with regard to Study Areas for construction noise, that

*“A study area of 300 m from the closest construction activity is normally sufficient to encompass noise sensitive Receptors.”*

- 13.5.6 Therefore, the Study Area for airborne noise effects from construction activities has been limited to an area approximately 300m distance from the PEIR Assessment Boundary.

### Construction vibration

- 13.5.7 Groundborne vibration attenuates rapidly with distance. DMRB LA 111 (Ref 13-22) notes that

*“A study area of 100m from the closest construction activity with the potential to generate vibration is normally sufficient to encompass vibration sensitive*

*Receptors". However, for the purposes of this assessment, the same Study Area as defined for construction noise is also used for the assessment of construction vibration, as a conservative approach.*

#### Construction traffic noise

- 13.5.8 In accordance with relevant guidance on assessing noise from road traffic contained in DMRB LA111 (Ref 13-22), the Study Area for this aspect is defined as an area approximately 50m distance from road transport routes that may be used during the construction phase.

#### Operational noise from fixed plant associated with the Solar Panels (intermediate transformers, inverters)

- 13.5.9 The Study Area for this aspect has been determined using professional judgement and experience of similar developments as an area approximately 500m distance from the PEIR Assessment Boundary. The Study Area has been determined using professional judgement as there is no relevant guidance setting out the spatial extents of study areas that should be considered when assessing operational noise from fixed plant.

#### Operational noise from new fixed plant required for the grid connection (e.g. transformers, switchgear, etc.)

- 13.5.10 The Study Area for this aspect has been determined using professional judgement and experience of similar schemes as an area approximately 1000m distance from the PEIR Assessment Boundary. The Study Area has been determined using professional judgement as there is no relevant guidance setting out the spatial extents of Study Areas that should be considered when assessing operational noise for the grid connection.

### Sensitivity of Receptors

- 13.5.11 **Table 13-8** below details the basis for assessing receptor sensitivity which has been produced on the basis of experience of assessing similar facilities and the application of professional judgement, taking into account the draft guidance in Noise and Soundscape Plan for Wales 2023 – 2028 (Consultation draft) (Ref 13-13).

Table 13-8: Receptor sensitivity

Sensitivity	Examples of receptor usage
<b>High</b>	Hospital operating theatres, recording studios, outdoor recreation areas where tranquillity is intrinsic to the location (e.g., ‘Green Flag Award winning sites and tranquil local nature reserves’).
<b>Medium</b>	Dwellings, schools, hotels, outdoor recreation areas where tranquillity may be valued but is not intrinsic to the location.
<b>Low</b>	Offices.
<b>Negligible</b>	Industrial and commercial premises.

## Determination of Impact Magnitudes

### Construction activity noise (dwellings)

13.5.12 A quantitative assessment has been undertaken to determine the potential significant environmental effects relating to construction noise following the guidance set out in BS 5228-1 (Ref 13-11).

13.5.13 Predicted construction noise levels associated with the construction phase of the Proposed Development have been calculated in accordance with BS 5228-1 (Ref 13-11). Calculations have been undertaken based on typical configurations of plant items for key activities of each stage of construction. The configuration of plant items and associated noise levels assumed for the key construction activities are presented in **Appendix 13A**. The configuration of plant includes plant noise levels and ‘on-time’ duration for each plant item.

13.5.14 Noise levels associated with the construction of the following key elements listed below have been included in the assessment. For each activity, a worst-case scenario has been considered, e.g. for the construction of the construction compounds, site preparation is considered as a worst case, as this is the activity associated with construction of the compounds likely to generate the greatest noise emissions.

- Construction Compound Construction – Site Preparation;
- Access Road Ground levelling;
- Trenching for Cable Installation;

- Horizontal Directional Drilling (HDD);
- Foundation Construction; and
- Piling.

13.5.15 Whilst construction for many of the elements forming part of the Proposed Development are located in relatively limited spatial extents (construction compounds, access roads, foundations), there are also numerous small scale HDD sites and screw-piled supports for Solar Panels and inverters which will be required across a wide area. In general, the works required for the construction phase of the Proposed Development do not have extensive plant requirements and are unlikely to entail intensive work in any one location for an extended duration.

13.5.16 As set out in **Chapter 2: Description of the Proposed Development**, indicative construction hours consist of weekday daytimes (0700 to 1900 hrs) and Saturday mornings (0800 to 1300 hrs). Piling activities will be restricted to 0900 to 1700 hrs Monday to Friday. No activity will take place outside these hours unless agreed with the Local Authorities.

13.5.17 Predicted construction phase noise levels are representative of a reasonable worst-case maximum noise level when a given construction activity would be in closest proximity to the nearest receptors. As such, it is considered that the predicted construction phase noise levels (for most construction activities) are indicative of the noise level that receptors would be exposed to for a duration of around one to three days, and that in the longer term, e.g. weeks/ months, construction noise levels would tend to be significantly lower, in the order of 10 to 20 dB lower, than the predicted levels.

13.5.18 The only construction activities which may take place in a relatively limited area over a longer period is HDD, which is assumed to be in one location for around one to two weeks.

13.5.19 The determination of the magnitude of change due to construction noise is based on the ABC method, provided in Annex E.3.2 of BS 5228-1 (Ref 13-11). The method relies on comparing predicted noise levels with a significance threshold determined based on the measured baseline sound levels during the period when works would

take place. Table E.2 from Annex E.3.2 of BS 5228-1 containing the ABC method is reproduced below in **Table 13-9**. The BS 5228-1 threshold categories based on the baseline monitoring results are provided in **Appendix 13B**.

Table 13-9: Construction Noise: Threshold of Potential Significant Impact at Dwellings

Assessment category and threshold value period	Threshold value, in decibels, dB, $L_{Aeq,T}$		
	Cat. A <sup>A)</sup>	Cat. B <sup>B)</sup>	Cat. C <sup>C)</sup>
<b>Night-time (23:00 –07:00)</b>	45	50	55
<b>Evenings and weekends <sup>D)</sup></b>	55	60	65
<b>Daytime (07:00 –19:00) and Saturdays (07:00–13:00)</b>	65	70	75

**NOTE 1** - A potential significant adverse effect is indicated if the  $L_{Aeq,T}$  noise level arising from the Site exceeds the threshold level for the category appropriate to the ambient noise level.

**NOTE 2** - If the ambient noise level exceeds the Category C threshold values given in the table (i.e. the ambient noise level is higher than the above values), then a potential significant adverse effect is indicated if the total  $L_{Aeq,T}$  noise level for the period increases by more than 3 dB due to Site noise.

**NOTE 3** - Applied to residential receptors only.

**A) Category A:** threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are less than these values.

**B) Category B:** threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are the same as Category A values.

**C) Category C:** threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are higher than Category A values.

**D) 19:00–23:00 weekdays, 13:00–23:00 Saturdays and 07:00–23:00 Sundays.**

13.5.20 The ABC method is used to indicate potentially significant effects. However, after following the ABC method to indicate significance Annex E.3.2 of BS 5228-1 (Ref 13-11) states

*“The assessor then needs to consider other project-specific factors, such as the number of receptors affected and the duration and character of the impact, to determine if there is a significant effect”.*

13.5.21 With regard to duration of exposure, BS 5228-1 provides temporal thresholds above

which additional noise insulation must be provided. The temporal thresholds provided in BS 5228-1, where additional noise insulation must be provided if construction noise exceeds specific threshold levels, are durations longer than:

- 10 or more days or nights in any 15 consecutive days or nights; or
- A total number of days exceeding 40 in any six consecutive months.

13.5.22 Exceedance of these temporal thresholds is considered to entail a significant effect. Based on the above, the magnitude of impact categories for construction noise are provided below in **Table 13-10**.

*Table 13-10: Construction Noise Magnitude of Impact*

Magnitude of Impact	Criteria	Semantic
<b>High</b>	Noise levels exceeding BS 5228-1 threshold and the temporal criteria.	Construction noise levels very much greater than baseline and disruptive.
<b>Medium</b>	Noise levels exceeding BS 5228-1 threshold but not exceeding the temporal criteria.	Construction noise levels greater than baseline and potentially disruptive.
<b>Low</b>	Noise levels equal to, but not exceeding, BS 5228-1 threshold.	Construction noise levels just greater than baseline. Very unlikely to be disruptive.
<b>Negligible</b>	Noise levels not exceeding BS 5228-1 threshold.	Construction noise levels may be just above or below baseline noise levels, but not disruptive.

13.5.23 All construction activities are anticipated to occur during normal construction hours (i.e., weekday and Saturday daytimes), with the exception of HDD activities, which typically entail some noise emissions during the night-time, as HDD requires that pumps run continuously to ensure that drilled bore sections do not collapse.

#### Construction activity noise (recreation routes)

13.5.24 BS 5228-1 Annex E.3.3 (Ref 13-11) provides a method for assessing construction noise to outdoor areas used for recreation. Potentially significant impacts may occur if the total noise (pre-construction ambient plus site noise) exceeds the pre-

construction ambient by 5dB or more, subject to a lower cut-off value of construction noise of 65dBA during the daytime. Impacts may be significant if the above criteria are exceeded for a duration of one month or more, unless works of a shorter duration are likely to result in a significant effect.

### Construction activity vibration

13.5.25 The only construction activity considered to be a potentially significant source of construction vibration is percussive piling. The requirement for percussive piling has not been confirmed. However, at this stage, it is assumed that percussive piling may be required for the foundations for the intermediate transformers and/ or for the foundations for Grid Connection Infrastructure.

13.5.26 Levels of construction vibration from percussive piling have been predicted and assessed at the nearest receptors using the methods and criteria discussed in BS 5228-2 (Ref 13-12). Criteria provided in BS 5228-2 for vibration impacts to human receptors and to structures have been used to indicate varying impact magnitudes in **Table 13-11** and **Table 13-12**, respectively.

*Table 13-11: Criteria for construction and decommissioning vibration (human response)*

Effects Level	PPV Vibration Level
<b>High</b>	Above or equal to 10 mm/s Peak Particle Velocity (PPV)
<b>Medium</b>	Above and equal to 1 mm/s and below 10 mm/s PPV
<b>Low</b>	Above or equal to 0.3 mm/s and below 1 mm/s PPV
<b>Negligible</b>	Below 0.3 mm/s PPV.

*Table 13-12: Criteria for construction and decommissioning vibration (building response)*

Magnitude of Impact	PPV level (mm/s)	Damage Category
<b>High</b>	≥ 60	Major
<b>Medium</b>	≥ 30	Minor
<b>Low</b>	≥ 15	Cosmetic
<b>Negligible</b>	< 15	-

### Construction road traffic noise

13.5.27 The assessment of construction road traffic noise will be undertaken with reference to CRTN (Ref 13-23) and DMRB LA111 (Ref 13-22). **Table 13-13** provides the

impact magnitude categories for assessing increases of road noise on the local highway network due to construction traffic, based on the guidance contained within DMRB and using professional judgement. The Basic Noise Level (BNL) is the calculated sound level due to road traffic, accounting for the traffic flow, speed and percentage of Heavy Goods Vehicles (HGVs), at 10 m from the carriageway edge, as set out in CRTN.

Table 13-13: Criteria for Construction Traffic Noise

Magnitude of Impact	Difference between baseline and construction traffic noise levels, dB
<b>High</b>	Greater than or equal to 5.0
<b>Medium</b>	Greater than or equal to 3.0 and less than 5.0
<b>Low</b>	Greater than or equal to 1.0 and less than 3.0
<b>Negligible</b>	Less than 1.0

### Operational Noise

13.5.28 A 3D computer noise model was produced using CadnaA 2025 software. This model has been used to predict operational noise levels in accordance with ISO 9613 Part 2 (Ref 13-20). Details of the plant source noise levels and of the prediction of operational phase noise levels are provided in **Appendix 13A**. At this stage, the predicted noise levels are preliminary, and worst-case, as there is no account of variation of operational noise at different times of day. It is expected that noise emissions from the inverters and intermediate transformers will be substantially reduced during hours of darkness.

13.5.29 As the predicted operational noise levels are preliminary a full quantitative assessment is not presented here. However, the results of the preliminary assessment are discussed here qualitatively based on the preliminary results. A full quantitative assessment will be provided in the ES. Subject to the provision of suitable data, the quantitative assessment presented in the ES will take account of anticipated variations in operational noise at different times of day.

13.5.30 Noise emissions from the inverters, intermediate transformers and grid connection infrastructure have been considered. A review of the different grid connection options defined in **Chapter 2: Description of the Proposed Development**,

indicated that Option 2 is the worst case, with regard to noise, at all receptor locations. Option 2 has therefore been considered in the assessment. Based on the information received, the only significant noise sources at the infrastructure required for the grid connection are the 132/33kv transformers.

13.5.31 A preliminary assessment of operational noise effects on dwellings has been undertaken with reference to BS 4142 (Ref 13-6). The assessment of operational noise effects to users of the Wales Coast Path will be undertaken through a noise change assessment, and by consideration of the spatial extent to which different sections of the path are exposed to operational noise. For the purposes of the preliminary assessment, operational noise levels have been predicted at the three points on the Wales Coast Path indicated in **Table 13-17**.

13.5.32 The assessment of impacts to soundscape will be undertaken, for dwellings, through consideration of context in accordance with BS 4142. Potential impacts to soundscape at the Wales Coast Path will be undertaken qualitatively, based on the findings of the baseline survey and the predicted operational noise levels.

13.5.33 **Table 13-14** below provides the magnitude of change categories for assessing operational noise, based on the results of the initial estimate of impact undertaken in accordance with BS 4142. The final determination of significance depends on consideration of the context, in accordance with the methods detailed in the standard.

*Table 13-14: Criteria for Fixed Plant Noise*

Magnitude of Impact	Rating level (external) at façade of receptor, $L_{Ar,Tr}$
<b>High</b>	Rating levels significantly exceeding (+8 dB, or more, above) representative background sound levels. Final determination of magnitude of change subject to consideration of context.
<b>Medium</b>	Rating levels moderately exceeding (+3 to +7 dB above) representative background sound levels. Final determination of magnitude of change subject to consideration of context.

Magnitude of Impact	Rating level (external) at façade of receptor, $L_{Ar,Tr}$
<b>Low</b>	Rating levels just exceeding (+1 to +2 dB above) representative background sound levels. Final determination of magnitude of change subject to consideration of context.
<b>Negligible</b>	Rating levels equal to, or lower than, representative background sound levels. Final determination of magnitude of change subject to consideration of context.

13.5.34 Assessment of predicted noise changes are undertaken with reference to the noise change criteria provided in **Table -13-15**, below, based on criteria from the IEMA Guidelines (Ref 13-17).

*Table -13-15: Criteria for Ambient Noise change*

Indicative magnitude	Noise change, dB	Description
<b>Negligible</b>	0	No increase in ambient noise levels.
<b>Low</b>	+1 to +2	Increase in ambient noise level tending to be imperceptible.
<b>Medium</b>	+3 to +5	Perceptible ambient noise level increase.
<b>High</b>	$\geq +6$	Perceptible and noticeable increase in ambient noise level.

### Consideration of Impacts to Soundscape at the Wales Coast Path

13.5.35 Soundscapes are comprised, primarily, of acoustic elements, but also of visual elements which inform the understanding and expectation of the sounds heard. These elements consist of both objective and subjective aspects which, in combination, define the auditory and visual perception of an area. The objective aspect is considered in terms of noise change and, in the ES, will be considered in terms of the predicted operational noise level across the length of the Wales Coast Path in the Study Area. Consideration of the subjective aspects are considered qualitatively, based on the likely subjective perception of the baseline ambient acoustic environment with the addition of the operational sound. Assessment of likely significant effects due to visual impacts of the Proposed Development are

provided in **Chapter 11: Landscape and Visual Amenity**.

### Construction noise and vibration: decommissioning

13.5.36 The environmental effects associated with the decommissioning phase are expected to be similar to those during the construction phase works. Therefore, the likely significance of effects relating to the construction phase assessment will be applicable to the decommissioning phase.

## 13.6 Significance Criteria

13.6.1 **Table 13-16** below provides the matrix which will be used to determine the significance of effects based on the sensitivity of the receptor and the predicted magnitude of change.

13.6.2 The additional diagonal of 'potentially significant' effects reflects the complex nature of noise impact assessment, which often relies not only on the difference between the predicted sound level and the baseline sound level, but also on absolute levels, the total ambient sound level, and other factors such as the time of day, the character of the sound, the duration that a sound may be present for, etc. This approach allows for appropriate application of guidance in the relevant British Standards and professional judgement in cases where there are various factors to consider when determining the significance of effects. Further guidance on the determination of significance for different aspects is provided below **Table 13-16**.

Table 13-16: Classification of Effects

		Magnitude of Impact			
		High	Medium	Low	Negligible
Sensitivity or value of resource	High	Major (Significant)	Moderate or Major (Potentially significant)	Moderate (Potentially significant)	Minor (Not significant)
	Medium	Moderate or Major (Potentially significant)	Moderate (Potentially significant)	Minor (Not significant)	Negligible (Not significant)
	Low	Moderate (Potentially significant)	Minor (Not significant)	Negligible (Not significant)	Negligible (Not significant)
	Negligible	Minor (Not significant)	Negligible (Not significant)	Negligible (Not significant)	Negligible (Not significant)

Note: Significant effects are those identified as 'Major'. 'Moderate' effects would normally be deemed to be significant. However, there may be some exceptions, depending on professional judgment of the context of the scenario.

## Construction Noise and Vibration

13.6.3 Construction noise and vibration effects may be considered significant where it is determined that a medium or high magnitude of impact, as set out in **Table 13-10**, will occur at a dwelling for a duration longer than:

- 10 or more days or nights in any 15 consecutive days or nights; or
- A total number of days exceeding 40 in any six consecutive months.

13.6.4 The temporal thresholds, above, align with the criteria for provision of additional insulation, as set out in BS 5228-1 (Ref 13-11) Annex E.4, which is provided for airborne noise, but is also considered applicable when assessing potential vibration impacts.

13.6.5 The works required for the construction phase of the Proposed Development do not have extensive plant requirements and are unlikely to entail intensive work in one location for an extended duration. As such, it is considered unlikely that any construction activities, and associated impacts, will affect any receptor for a duration longer than indicated above.

13.6.6 However, once a Contractor is appointed, further assessment of potential construction noise impacts should be undertaken. The further assessment, based on detailed construction information, should define the requirements for primary and secondary mitigation. The results of the assessment should be set out in the detailed CEMP and any required mitigation implemented accordingly.

### Construction Road Traffic Noise

13.6.7 Increases of road traffic noise on the local highway network are likely significant if they fall within the high magnitude of impact set out in **Table 13-13** and potentially significant if they fall within the medium magnitude of impact set out in **Table 13-13**, depending on the absolute levels of existing and predicted road traffic noise.

### Operational Noise

13.6.8 Operational noise effects are considered significant if the initial estimate of impact indicates an adverse or significant adverse effect, and if the outcome of the initial estimate is supported by consideration of context. In some cases, it is necessary to modify the outcome of the initial estimate based on consideration of context. Based on the outcome of the initial estimate, magnitudes of impact described as medium or high in **Table 13-14** may be considered potentially significant.

13.6.9 With regard to the consideration of context, BS 4142 states:

*"Where the initial estimate of the impact needs to be modified due to the context, take all pertinent factors into consideration, including the following:*

*1) The absolute level of sound. For a given difference between the rating level and the background sound level, the magnitude of the overall impact might be greater for an acoustic environment where the residual sound level is high than for an acoustic environment where the residual sound level is low.*

*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.*

*Where residual sound levels are very high, the residual sound might itself result in adverse impacts or significant adverse impacts, and the margin by which the rating*

level exceeds the background might simply be an indication of the extent to which the specific sound source is likely to make those impacts worse.

2) The character and level of the residual sound compared to the character and level of the specific sound. Consider whether it would be beneficial to compare the frequency spectrum and temporal variation of the specific sound with that of the ambient or residual sound, to assess the degree to which the specific sound source is likely to be distinguishable and will represent an incongruous sound by comparison to the acoustic environment that would occur in the absence of the specific sound. Any sound parameters, sampling periods and averaging time periods used to undertake character comparisons should reflect the way in which sound of an industrial and/or commercial nature is likely to be perceived and how people react to it. ...”

## 13.7 Baseline Conditions

### Sensitive Receptors

13.7.1 A desk-based review was undertaken to identify receptors within the Study Areas described in **Section 13.5** and shown in **Figure 13-1**. The key receptor locations identified in the review, and which are considered in the assessment, are listed below in **Table 13-17**.

Table 13-17: Sensitive Receptor Locations

Ref.	Location	Description	Approximate coordinates, Lat./ Long.	Approximate Distance to Site, m
<b>R01</b>	Wales Coast Path (west)	Recreation route	51.541557, -2.8729308	10
<b>R01</b>	Wales Coast Path (central)	Recreation route	51.547368, -2.8418628	10
<b>R01</b>	Wales Coast Path (east)	Recreation route	51.556369, -2.8176520	10
<b>R02</b>	Court Farm, Whitson Road	Residential	51.560218, -2.9091646	85

Ref.	Location	Description	Approximate coordinates, Lat./ Long.	Approximate Distance to Site, m
<b>R03</b>	Bali-Hai, Half Acre Lane, Whitson	Residential	51.548872, - 2.8985400	470
<b>R04</b>	Porton Road, Whitson	Residential	51.545528, - 2.8925327	50
<b>R05</b>	Cottage Farm, Whitson	Residential	51.539397, - 2.8815985	70
<b>R06</b>	Grangefield Farm	Residential	51.560087, - 2.8828065	220
<b>R07</b>	Dwelling at Tonew Kennels, Rush Wall	Residential	51.566923, - 2.8667655	180
<b>R08</b>	Greenfield House, Cock Street	Residential	51.560192, - 2.8663057	45
<b>R09</b>	North Row House	Residential	51.559803, - 2.8629228	125
<b>R10</b>	Mead Farm, Mead Lane	Residential	51.551095, - 2.8561235	55
<b>R11</b>	Church Farm, Redwick	Residential	51.552081, - 2.8503584	140
<b>R12</b>	The Gables, Redwick	Residential	51.552253, - 2.8477222	140
<b>R13</b>	Great House	Residential	51.553080, - 2.8428048	155
<b>R14</b>	Fir Tree Farm	Residential	51.554329, - 2.8403327	85
<b>R15</b>	Summerleaze Farm	Residential	51.560607, - 2.8299754	45
<b>R16</b>	Yew Tree Cottage	Residential	51.561744, - 2.8281928	20
<b>R17</b>	Pill Farm	Residential	51.565174, - 2.8185890	10

Ref.	Location	Description	Approximate coordinates, Lat./ Long.	Approximate Distance to Site, m
<b>R18</b>	The Summer House, Hawthorn Cottage	Residential	51.570216, - 2.8137450	20
<b>R19</b>	Greenfield	Residential	51.569250, - 2.8117799	15
<b>R20</b>	Cherry Tree House, Chapel Farm	Residential	51.564323, - 2.8052145	120

## Current Baseline

### Environment in Vicinity of Receptors

- 13.7.2 The environment in the immediate vicinity of the receptors identified above is predominantly rural but also contains a significant industrial element and important transport infrastructure. Within approximately 2km of receptors there is the M4 motorway, the South Wales mainline railway, the Llanwern Steel Works and a number of existing and consented solar farms.
- 13.7.3 The majority of the receptors are isolated dwellings which are located a significant distance from nearby settlements and major noise sources. For example, the only receptors within, or close to, a village are those receptors (Mead Farm, Church Farm, The Gables, Great House, Fir Tree Farm) in or near Redwick, a small village approximately 1km north of the shore of the Severn Estuary and 9km east of Newport. Hawthorn Cottage and Greenfield situated to the north-east are in closest proximity to a town (Magor, approximately 1km north), the M4 motorway (approximately 2km north and north-west) and the South Wales Mainline railway (approximately 1km north). The western most receptor (Court Farm) is the receptor in closest proximity to existing industry, with the National Grid Whitson Substation being approximately 500m to the north and the Llanwern Steel Works approximately 1.3km to the north.

## Baseline Noise Monitoring

- 13.7.4 A program of baseline acoustic monitoring was undertaken to quantify and characterise the existing acoustic environment at locations representative of those receptors considered likely to experience the lowest baseline ambient sound levels, and the likely highest construction and/ or operational sound levels due to the construction and operation of the Proposed Development.
- 13.7.5 The baseline monitoring was undertaken and reported in accordance with the methods and guidance provided in BS 7445 (Ref 13-21, Ref 13-24), BS 4142 (Ref 13-6) and BS 5228-1 (Ref 13-11). The baseline survey methodology was agreed with representatives of Monmouthshire County Council and Newport City Council. The locations, dates and receptor locations which the monitoring locations are considered representative of are set out in **Table 13-18**, below. All monitoring locations are identified in **Figure 13-1** and full details of the monitoring are provided in **Appendix 13B**.

Table 13-18: Noise monitoring locations (NML)

Monitoring Location	Monitoring dates	Representative of receptor
<b>NML1</b>	n/a	See <b>Appendix 13B</b>
<b>NML2</b>	20 June 2025 – 30 June 2025	R02, R03, R04, R05, R06
<b>NML3</b>	20 June 2025 – 30 June 2025	R07, R08, R09
<b>NML4</b>	20 June 2025 & 30 June 2025	R01
<b>NML5</b>	24 June 2025 – 30 June 2025	R10, R11, R12, R13, R14, R15, R16, R17, R18, R19
<b>NML6</b>	24 June 2025 – 30 June 2025	R20

- 13.7.6 A summary of the baseline monitoring results is provided below in **Table 13-19**. The ambient  $L_{Aeq,T}$  sound levels on weekday daytimes are used in the assessment of construction phase noise and the representative background  $L_{A90,T}$  sound levels are used in the assessment of operational phase noise.

Table 13-19: Summary of Baseline Monitoring Results

Location	Period, T	Measured Sound Level, dB*		
		L <sub>Aeq, T</sub>	Range L <sub>AFmax</sub> *	Representative** L <sub>A90, T</sub>
<b>NML1</b>		n/a See <b>Appendix 13B</b>		
<b>NML2</b>	Weekday daytime (0700 - 1900 hrs)	47	47 - 89	34
	Weekend daytime (0700 - 1900 hrs)	46	48 - 76	34
	Evening (all days) (1900 - 2300 hrs)	45	35 - 79	29
	Night-time (all days) (2300 - 0700 hrs)	46	34 - 82	28
	Saturday (0700 - 1300 hrs)	45	53 - 76	32
	Saturday (1300 - 1900 hrs)	40	50 - 64	33
<b>NML3</b>	Weekday daytime (0700 - 1900 hrs)	61	59 - 84	41
	Weekend daytime	60	63 - 86	41

Location	Period, T	Measured Sound Level, dB*		
		L <sub>Aeq, T</sub>	Range L <sub>AFmax</sub> *	Representative** L <sub>A90, T</sub>
	(0700 - 1900 hrs)			
	Evening (all days) (1900 - 2300 hrs)	49	43 - 78	35
	Night-time (all days) (2300 - 0700 hrs)	56	39 - 87	35
	Saturday (0700 - 1300 hrs)	59	66 - 83	41
	Saturday (1300 - 1900 hrs)	54	63 - 76	37
<b>NML4***</b>	Weekday daytime (0700 - 1900 hrs)	41	-	28
	Weekend daytime (0700 - 1900 hrs)	39	-	29
<b>NML5</b>	Weekday daytime (0700 - 1900 hrs)	49	59 - 78	35
	Weekend daytime	47	50 - 79	33

Location	Period, T	Measured Sound Level, dB*		
		L <sub>Aeq, T</sub>	Range L <sub>AFmax</sub> *	Representative** L <sub>A90, T</sub>
	(0700 - 1900 hrs)			
	Evening (all days) (1900 - 2300 hrs)	44	42 - 77	32
	Night-time (all days) (2300 - 0700 hrs)	43	36 - 79	29
	Saturday (0700 - 1300 hrs)	48	59 - 77	38
	Saturday (1300 - 1900 hrs)	48	60 - 72	41
<b>NML6</b>	Weekday daytime (0700 - 1900 hrs)	46	48 - 84	29
	Weekend daytime (0700 - 1900 hrs)	44	42 - 80	30
	Evening (all days) (1900 - 2300 hrs)	40	37 - 67	28
	Night-time (all days)	39	28 - 75	25

Location	Period, T (hrs)	Measured Sound Level, dB*		
		L <sub>Aeq, T</sub>	Range L <sub>AFmax</sub> *	Representative** L <sub>A90, T</sub>
	(2300 - 0700 hrs)			
	Saturday (0700 - 1300 hrs)	44	51 - 76	37
	Saturday (1300 - 1900 hrs)	46	50 - 80	37

\* - Excluding periods with unfavourable weather conditions and unrepresentative events.  
\*\* - 25th percentile of measured L<sub>A90, T</sub> sound levels.  
\*\*\* - Corrected from NML6 based on concurrent measurement data.

13.7.7 Based on the monitoring results in **Table 13-19**, above, the BS 5228-1 threshold categories at each of the monitoring locations is provided in **Table 13-20**, below.

Table 13-20: BS 5228-1 Threshold Categories

Baseline dataset	BS 5228-1 Threshold of Significance Category			BS 5228-1 Threshold Value, dB		
	Day (Weekdays)	Evening (All days)	Night (All days)	Day (Weekdays)	Evening (All days)	Night (All days)
<b>NML1</b>	N/A See <b>Appendix 13B</b>					
<b>NML2</b>	A	A	B	65	55	50
<b>NML3</b>	A	A	C	65	55	55
<b>NML4</b>	A	A	A	65	55	45
<b>NML5</b>	A	A	B	65	55	50
<b>NML6</b>	A	A	A	65	55	45

## 13.8 Embedded Design Mitigation

13.8.1 A range of environmental measures to control noise emissions during the construction phase have been embedded into the Proposed Development are detailed in the oCEMP (**Appendix 2A**) and will be set out in a oCEMP submitted with the ES (**paragraph 13.3.6**).

13.8.2 Noise emissions during the operational phase will be controlled by an Operational Noise Management Plan (ONMP). Indicative requirements for mitigation measured to control operational noise will be confirmed in the ES.

13.8.3 **Table 13-21**, below, outlines how the embedded measures outlined above will influence the noise and vibration assessment.

*Table 13-21 Summary of the embedded environmental measures and how these influence the noise and vibration assessment*

Receptor	Changes and effects	Embedded measures and influence on assessment
<b>Receptors near to construction activities</b>	Potential adverse effects associated with construction noise and vibration.	<p>Undertaking construction in accordance with good practice and BPM, to be set out in the oCEMP supporting this PEIR.</p> <p>All construction activities to be undertaken within normal working hours for construction. Whilst most HDD activities are considered likely to be complete in relatively short durations (&lt;7 days), where any HDD work is required over an extended period, and where the potential for significant effects arises, applying BPM in accordance with the recommendations in BS 5228-1 (Ref 13-11).</p>
<b>Receptors where operational noise could give rise to significant effects</b>	Potential increase in ambient noise levels due to the operation of fixed and mobile plant, including on-site vehicle movements.	<p>The preliminary assessment of operational phase noise emissions, provided in <b>Section 13.9</b>, indicates that, at certain receptors during the evening and night-time, there is the potential for significant effects.</p> <p>Mitigation measures required to control operational noise are identified as additional mitigation and are discussed in <b>Section 13.10</b>.</p> <p>Further analysis of the mitigation measures required to reduce operational noise in order to</p>

Receptor	Changes and effects	Embedded measures and influence on assessment
		<p>avoid significant effects will be presented in the ES. The mitigation strategy to be implemented during the operational phase may be subject to further refinement based on the final selection of plant and further detailed noise assessment work. The mitigation strategy to be used in the as-built design will be confirmed post-consent, in an updated version of the ONMP.</p>

## 13.9 Assessment of Likely Impacts and Effects

### Construction Phase

#### Construction Activity Noise affecting Dwellings

- 13.9.1 A preliminary assessment of construction phase noise effects has been undertaken based on the plant data provided in **Appendix 13A**. Predicted noise levels and associated impacts and effects are also representative of likely effects during the Decommissioning stage.
- 13.9.2 The preliminary assessment considers worst case construction noise levels at the closest receptor to each activity. Whilst the construction programme indicates that some of the activities considered would be undertaken simultaneously, it is unclear to what extent any two activities would overlap and be undertaken in a similar area at the same time. Therefore, whilst it is considered there is some potential for construction activities to overlap in one area, there is currently not enough detail available to identify where and when this is likely to occur.
- 13.9.3 However, as outlined below, it is considered that most construction activities would not be in any one location for an extended period of time. On this basis, it is considered unlikely that overlapping construction activities would be likely to cause substantial increases in the predicted construction noise levels, or to materially increase the duration of exposure to construction noise at any one receptor. Nonetheless, when a construction contractor is appointed, and detailed construction

information becomes available, the potential for construction activities to give rise to increased construction noise levels and/ or increased durations of exposure to construction noise will be assessed in further detailed assessment work, and this will be incorporated into the detailed CEMP. Where the further detailed assessment work identifies the potential for significant effects, additional mitigation will be specified and incorporated into the detailed CEMP in order to minimise and avoid the potentially significant effects identified.

13.9.4 Predicted construction phase noise levels at the nearest Noise Sensitive Receptor to each construction activity are presented in **Table 13-22**, below.

*Table 13-22: Construction Noise Levels at Nearest NSRs*

Activity	Nearest NSR	Approx. distance to NSR, m	Predicted construction noise level, dB $L_{Aeq,T}$
<b>1. Compound Site Preparation</b>	NSR16	125	57
<b>2. Access Road Ground levelling</b>	NSR17	60	68
<b>3. Trenching</b>	NSR16	25	78
<b>4. HDD (night)</b>	NSR16	230	53
<b>5. Foundation Construction</b>	NSR8	150	58
<b>6. Screw piles for Solar Panels &amp; inverters</b>	NSR16	25	78

13.9.5 Based on the predicted construction phase noise levels provided in **Table 13-22**, the baseline conditions set out in **Table 13-18**, **Table 13-19** and **Table 13-20**, and the criteria provided in **Table 13-10**, the predicted magnitudes of impact during the construction phase are presented in **Table 13-23**, below.

Table 13-23: Construction and Decommissioning Noise Levels at Varying Distances

Activity	BS 5228-1 Threshold of significance Category	BS 5228-1 Threshold	Difference $\Delta$ between predicted construction noise level and threshold, dB	Likely duration of exposure, days	Magnitude of impact
<b>1. Compound Site Preparation</b>	A	65	-8	1-3	Negligible
<b>2. Access Road Ground levelling</b>	A	65	+3	1-3	Medium
<b>3. Trenching</b>	A	65	+13	1-3	Medium
<b>4. HDD (night)</b>	B	50	+3	14	High
<b>5. Foundation Construction</b>	A	65	-7	1-3	Negligible
<b>6. Screw piles for Solar Panels &amp; inverters</b>	A	65	+13	1-3	Medium

13.9.6 The assessment in **Table 13-23** indicates that, for construction activities 1 and 5, predicted construction noise levels are below the BS 5228-1 (Ref 13-11) thresholds and would result in impacts of negligible or low magnitude. With reference to **Table 13-16**, impacts which are of negligible or low magnitude to receptors of medium sensitivity result in effects which are negligible or minor and are **Not Significant**.

13.9.7 For construction activities 2, 3 and 6 presented in **Table 13-23** above, predicted construction noise levels are up to +13 dB above the BS 5228-1 (Ref 13-11) thresholds. The likely duration of exposure to the predicted noise levels from these activities is considered likely to be around one to three days. This is on the basis that construction activities 2 and 3 will be undertaken on linear work areas, where works will progress along the route of the access road/ cabling, and activity 6 will be undertaken over a wide area where work will progress to different locations rapidly. Therefore, construction noise levels over the longer term, i.e. weeks and months, will tend to fall significantly below the predicted worst case levels presented in **Table 13-22**. On this basis, it is considered unlikely that exceedances of the BS 5228-1 thresholds would occur over durations in excess of those set out under **paragraph 13.6.3**.

- 13.9.8 Therefore, with reference to the criteria provided in **Table 13-10**, predicted impact magnitudes due to noise from construction activities 2, 3 and 6 are of medium magnitude. With reference to **Table 13-16**, impacts of medium magnitude to receptors of medium sensitivity result in effects which are moderate and are potentially significant. As set out above, it is considered unlikely that the nearest receptors would be exposed to the predicted worst-case construction noise levels for periods in excess of those set out under **paragraph 13.6.3**. On this basis the predicted impacts of medium magnitude would result in effects which are **Not Significant**.
- 13.9.9 For construction activity 4 presented in **Table 13-23** above, the predicted construction noise level at the worst affected receptor is 3 dB above the BS 5228-1 threshold. It is assumed for the purposes of this assessment that the HDD could continue for up to 14 consecutive days at a single location, which exceeds the temporal threshold set out under **paragraph 13.6.3**. This assumption was utilised as a worst-case scenario assessment as these details are yet to be confirmed, if each HDD crossing takes less than the 14 days the impact would be reduced.
- 13.9.10 Therefore, with reference to the criteria provided in **Table 13-10**, predicted impact magnitudes due to noise from construction activity 4 is of high magnitude. With reference to **Table 13-16**, impacts of high magnitude to receptors of medium sensitivity result in effects which are moderate or major, and are potentially significant. As such, the assessment indicates that additional mitigation will be required to reduce construction noise levels from HDD activities during the night-time at the worst affected receptor, to avoid significant effects. This is discussed below in **Section 13.11**. Noise impact at other receptors is considered unlikely due to the increased distance from HDD sites, however, a review of cumulative effects from multiple HDD sites will be conducted at ES. The requirements for mitigation will be confirmed in an ONMP.

#### Noise from Construction Activities affecting the Wales Coast Path

- 13.9.11 A preliminary assessment of construction noise effects to users of the Wales Coast Path is presented below based on predicted worst case construction noise levels.

13.9.12 With reference to the criteria provided under **paragraph 13.5.24**, and the representative daytime baseline ambient sound levels at the Wales Coast Path, which is that presented in **Table 13-19** for NML4: 42 dB  $L_{Aeq,12h}$ , the threshold of significance for construction noise on the Wales Coast Path is 65 dB  $L_{Aeq,12h}$ .

13.9.13 The closest construction activity to the Wales Coast Path will be screw piling for Solar Panel and inverter supports. The closest points of the Wales Coast Path to screw piling activities are near to the western extent of the PEIR Assessment Boundary, where the path is approximately 40m distance from construction activity for Phase 1, and a longer stretch of the path near the eastern extent of the PEIR Assessment Boundary where the path is approximately 30m distance from the construction activity for Phase 3. There are also long sections of the path which are around 80m from proposed screw piling activities for Phase 2 and Phase 3.

13.9.14 Predicted construction noise levels from screw piling, assuming propagation over soft ground, are:

- at 30 m - 75 dB  $L_{Aeq,T}$ ,
- at 40 m - 72 dB  $L_{Aeq,T}$ , and
- at 80 m - 64 dB  $L_{Aeq,T}$ .

13.9.15 Based on the above, the predicted construction noise level at the closest points on the Wales Coast Path to proposed construction activities are +7 to +10 dB above the threshold of significance and are therefore potentially significant, depending on the duration and extent of exposure. At the longer mid-section which is around 80m from proposed screw piling activities, predicted construction noise levels are 1dB below the threshold of significance and are therefore **Not Significant**.

13.9.16 Guidance from BS 5228-1 (Ref 13-11), reproduced under **paragraph 13.6.3** states that impacts may be significant if the criteria are exceeded for a duration of one month or more, unless works of a shorter duration are likely to result in a significant effect.

13.9.17 It is noted that the predicted construction noise levels of 72 to 75 dB  $L_{Aeq,T}$  are representative of a worst-case scenario when construction activities are closest to the Wales Coast Path. As outlined above under **paragraph 13.9.7**, it is considered that the duration of exposure to construction noise at this level is likely to be around

one to three days. For the rest of the construction programme, construction activities would be at a much greater distance and associated construction noise levels would be much lower.

13.9.18 In support of the considerations above, it is noted that the construction programme indicates that piling activities for Phase 3 of the Proposed Development, where the Wales Coast Path is in closest proximity, would take 9 weeks. Phase 3 covers an extensive area and only a very limited portion of Phase 3 is in close proximity to the Wales Coast Path. As such, the considerations presented above in **paragraph 13.9.17** are considered valid, and that the likely worst-case noise levels predicted would only occur on a limited number of days.

13.9.19 Near the western extent of the PEIR Assessment Boundary there is a stretch of the path approximately 40m from proposed screw piling for Phase 1 which is around 120m in length. Along this section of the path, it is considered unlikely that construction noise above the threshold would exceed a duration of around one to three days.

13.9.20 Near the eastern extent of the PEIR Assessment Boundary there is a stretch of the path approximately 30m from proposed screw piling for Phase 3 which is around 800m in length. There is potential that the threshold of significance may be exceeded for a duration in excess of one to three days at this section. However, it is considered unlikely that this would exceed a total of around one week.

13.9.21 Based on the above, it is considered that construction noise impacts to the Wales Coast Path would be **Not Significant**.

#### Airborne Noise from Construction Traffic

13.9.22 At this time, there is insufficient information available to undertake a preliminary assessment of any changes in road traffic noise due to the Proposed Development. The assessment of increases in road traffic noise due to the Proposed Development will be presented in the ES.

## Construction Vibration

- 13.9.23 The only construction activity considered to be a potentially significant source of vibration is percussive piling. The requirement for percussive piling has not been confirmed. However, at this stage, it is assumed that percussive piling may be required for the foundations for the intermediate transformers and/ or for the foundations for Grid Connection Infrastructure.
- 13.9.24 The nearest receptor to these elements is Receptor R08, approximately 75m from a proposed intermediate transformer.
- 13.9.25 Calculations of vibration levels associated with percussive piling, undertaken in accordance with BS 5228-2 (Ref 13-12), indicate that indicative worst-case levels of vibration are 1.5mm/s PPV at receptor R08.
- 13.9.26 With reference to the criteria in **Table 13-11** and **Table 13-12**, the predicted vibration levels due to percussive piling result in impacts of medium magnitude with regard to human perception and of negligible magnitude with regard to building damage. With reference to **Table 13-16**, and in consideration of impacts to human perception, impacts of medium magnitude to receptors of medium sensitivity result in moderate effects and are potentially significant. With reference to **Table 13-16**, and in consideration of potential building damage, impacts of negligible magnitude to receptors of medium sensitivity result in negligible effects and are **Not Significant**.
- 13.9.27 On the basis that building damage would not occur, that any residents in sufficiently close proximity to percussive piling would be informed of the nature and duration of the proposed works and that the duration of exposure would be limited to up to around a few days, it is considered that moderate effects to human perception would be **Not Significant**.
- 13.9.28 The requirement to inform nearby residents potentially subject to moderate effects from construction vibration to human perception will be set out in the oCEMP (**Appendix 2A**). An oCEMP will be submitted with the ES.

## Operational phase

### Operational noise affecting dwellings

- 13.9.29 A preliminary assessment of operational phase noise effects on the nearest dwellings has been undertaken based on the plant data provided in **Appendix 13A**, accounting for the noise emissions from the inverters, transformers and Grid Connection Infrastructure when operating at maximum duty, at all times, as a worst-case assumption. Preliminary predictions of operational noise were compared against the representative baseline sound levels as set out in **Appendix 13B**.
- 13.9.30 In general, the predicted specific sound levels are low in absolute terms. The preliminary results indicate that predicted specific sound levels at ground floor level are between 28 to 41 dB  $L_{Aeq,T}$  and predicted specific sound levels at first floor level are between 31 to 43 dB  $L_{Aeq,T}$ .
- 13.9.31 Using the subjective method for determining rating penalties, it was determined that a rating penalty of +2 dB for tonality being just perceptible is appropriate, to account for the character of the noise emissions from the transformers and inverters. The specific sound would not be impulsive or intermittent.
- 13.9.32 A BS 4142 (Ref 13-6) initial estimate of impact was undertaken by comparing the rating levels at each receptor with the representative background sound levels defined in **Table 13-18** and **Table 13-19**, and the outcomes of the initial estimate assessed against the criteria provided in **Table 13-14**. Preliminary consideration of context has been carried out in accordance with BS 4142 accounting for the level and character of the specific sound and the residual sound through a noise change assessment, with reference to the criteria in **Table -13-15**.
- 13.9.33 Based on the above, and with reference to **Table 13-16**, preliminary assessment results indicate that, during the daytime, operational noise would give rise to effects that are **Not Significant** at all receptors. During the evening, operational noise would give rise to effects that are **Not Significant** at the majority of receptors but would give rise to effects that are **Significant** or potentially significant at around a quarter of the receptor locations assessed. During the night-time, operational noise would give rise to effects that are:

- **Not Significant** at two receptors;
- Potentially significant at around half of the remaining receptors; and
- **Significant** at the remaining half of receptors.

13.9.34 The preliminary results indicate that additional mitigation will be required to reduce operational noise levels during the evening and night-time to avoid significant effects. This is discussed below in **Section 13.11**. The requirements for mitigation will be confirmed in an ONMP.

13.9.35 Whilst quantitative predictions informed the preliminary assessment, as outlined in **paragraph 13.5.30**, at this stage the assessment outcomes are provided qualitatively. A full quantitative assessment will be provided in the ES.

#### Operational noise affecting the Wales Coast Path

13.9.36 A preliminary assessment of operational phase noise effects on the Wales Coast Path has been undertaken based on the plant data provided in **Appendix 13A**, accounting for the noise emissions from the inverters and transformers when operating at maximum duty during the daytime as a worst-case assumption. For the purposes of the preliminary assessment, operational noise levels have been predicted at the three points on the Wales Coast Path indicated as R01 in **Table 13-17**. Whilst quantitative predictions informed the preliminary assessment, as outlined in **paragraph 13.5.30**, at this stage the assessment outcomes are provided qualitatively. A full quantitative assessment will be provided in the ES, which will present predicted operational noise contours to inform consideration of potential effects across the extent of the whole path adjacent to the PEIR Assessment Boundary.

13.9.37 A preliminary assessment of predicted noise change on the Wales Coast Path is presented below under the heading **Noise Change Assessment** and consideration of potential impacts to soundscape are considered under the heading **Consideration of Potential Impact to Soundscape**.

#### Noise Change Assessment

13.9.38 The results of the preliminary assessment indicate that, at the three points on the Coast path, predicted daytime noise changes are between +1 and +4dB. With reference to the criteria provided in **Table -13-15**, the predicted noise changes would

result in impacts from low to medium magnitude. With reference to **Table 13-8** and **Table 13-16**, impacts of low magnitude to receptors of medium sensitivity result in effects of minor significance and are **Not Significant** and impacts of medium magnitude to receptors of medium sensitivity result in effects of moderate significance and are potentially significant.

13.9.39 In consideration of the potentially significant moderate effects identified, it is considered that these would tend not to be significant on the following basis. The three points considered in the preliminary assessment are considered to represent worst case locations where operational noise will tend to be higher. There are substantial stretches of the Wales Coast Path adjacent to the development where operational noise will be lower, where resultant noise changes and associated impact magnitudes will be lower. Users of the Wales Coast Path are transient receptors which will be exposed to worst case operational sound levels for a limited duration, and any impacts would therefore be limited spatially and temporally. Therefore, it is considered that the moderate effects identified above would tend to be **Not Significant**.

#### Consideration of Potential Impact to Soundscape

13.9.40 The objective aspect of the influence of operational sound on the total ambient sound level is provided above in **paragraph 13.9.38**. Consideration of the subjective aspects are considered qualitatively, below. Assessment of likely significant effects due to visual impacts of the Proposed Development are provided in **Chapter 11: Landscape and Visual Amenity**.

13.9.41 Firstly, it is considered that the most important factor to note when considering potential impacts to the soundscape, is that the Proposed Development is bringing a new noise source to the acoustic environment. Whilst transport, industrial and agricultural uses are a feature of the local area, these tend not to dominate the soundscape of the Coast path. Though, subjectively, contributions from aeroplanes and distant farm machinery were noted when the surveyor was carrying out monitoring at NML4 at the Wales Coast Path.

13.9.42 As such, whilst the operational sound is a new noise source, it is considered that the character of the operational sound is not totally incongruent with the character of the

area, which features industrial and agricultural uses and also comprises transport noise.

13.9.43 When comparing the predicted operational sound levels at the three points on the Coast path identified as R01 in **Table 13-17** with the measured baseline sound levels, it is noted that, at one point the predicted operational sound level is equal to the baseline ambient sound level, at one point the predicted operational sound level is +1dB above the baseline ambient sound level, and -4dB below the measured baseline sound level at the third point. On this basis, it is considered that, at the two points where operational sound is predicted to be equal to or +1dB above the baseline ambient sound level, the operational sound would likely be perceptible, but would not dominate the acoustic environment, as the baseline sound sources and the operational sound are of a similar level. At the third point, where operational sound is predicted to be 4dB below the baseline ambient sound level, the operational sound may be audible, but baseline sources would tend to dominate.

13.9.44 With regard to the visual aspect, the Solar Panels are likely to be visible to users of the coast path at many points on the coast path. **Chapter 11: Landscape and Visual Amenity** explains that the view to the Proposed Development would be broken up by some existing and proposed planting, and that

*“A detailed landscape strategy will be required to identify areas of existing hedge removal, existing hedge management and new planting”.*

13.9.45 The assessment states that residual visual amenity effects to the coast path are moderate adverse.

13.9.46 Whilst the Proposed Development entails some impact to visual amenity, it is noted that, from a soundscape perspective, being able to perceive the Solar Panels visually and aurally will provide a congruent perception across the senses. Conversely, if the Solar Panels were not visible, but operational sound was audible, perception of the Proposed Development would not be congruent across the senses. It is, therefore, considered that being able to aurally perceive operational sound does not necessarily worsen any other adverse effects, such as those associated with visual amenity.

13.9.47 It is noted that acoustic monitoring must be undertaken during periods when weather

is calm, with low wind speeds and no precipitation. During the baseline monitoring at the Coast path at NML4, the water in the Severn Estuary was subjectively noted to be reasonably calm and whilst water movement was audible it was not a dominant source. This assessment is therefore considered representative of a worst-case when contributions from naturogenic sources will be lower than at times when wind speeds are higher, which would give rise to increases in the sound levels from water movement and wind in foliage. Additionally, the predicted operational sound levels are representative of the inverters and transformers operating at maximum duty. In reality, this is unlikely to occur. Operational sound levels are therefore worst-case and would tend to be lower than predicted for the majority of the time.

13.9.48 Taking into account the various aspects set out above, it is considered that impacts to the baseline soundscape caused by the addition of operational sound from the Proposed Development would tend towards minor magnitude. With reference to **Table 13-8**, the Wales Coast Path is considered to be of medium sensitivity. With reference to **Table 13-16**, impacts of minor magnitude to receptors of medium sensitivity result in effects of minor significance and are **Not Significant**.

## 13.10 Additional Mitigation and Enhancement Measures

13.10.1 No opportunities for environmental enhancement related to noise and vibration have been identified at this stage but will be considered further within the ES.

### Construction phase

13.10.2 The assessment of construction phase effects indicates that, should impact piling be required, at the closest receptor R08, an impact to human perception of medium magnitude, resulting in moderate effects which are potentially significant may occur. It is therefore recommended that, as additional mitigation, residents at R08 (and at any other dwellings in in sufficiently close proximity to percussive piling to result in a moderate effect) be informed of the nature and duration of the proposed works. With this additional mitigation, it is considered that moderate impacts to human perception would give rise to effects that are **Not Significant**.

13.10.3 With regards to HDD activities being conducted during night-time, an impact of high magnitude is predicted at the closest receptor R16, resulting in moderate to major effects which are potentially significant. Additional mitigation is therefore required to provide attenuation of 4dB or greater, to reduce noise levels below the BS 5228-1 threshold of significance and reduce the magnitude of impact. One such mitigation strategy is the selection of quieter construction plant, producing noise levels below those stated in the construction plant requirements set out in **Appendix 13A**. Another suitable mitigation strategy is to install temporary acoustic screening close to the construction plant, which is predicted to provide 5-10dB of attenuation. Using either of these two additional mitigation strategies, or a combination of the two, is likely to sufficiently reduce noise exposure at receptor R16 to below the BS 5228-1 threshold of significance, resulting in effects which are **Not Significant**.

### Operational phase

13.10.4 The preliminary assessment indicates that, without additional mitigation, operational noise will likely give rise to significant effects at nearby dwellings during the evening and night-time. Assuming this will be confirmed in the ES, additional mitigation will be required to reduce operational noise levels in order to minimise and avoid significant effects. Analysis will be undertaken, and presented in the ES, to identify specific plant items requiring mitigation and the attenuation required to achieve an

appropriate reduction in operational noise levels.

13.10.5 Information provided by the Applicant indicates that all fixed plant proposed as part of the Proposed Development can be mitigated through the provision of acoustic enclosures. A typical acoustic enclosure can achieve an attenuation of around 10 dB, with higher performance enclosures achieving around 20 dB attenuation.

13.10.6 With appropriately specified mitigation, operational noise can be reduced in order to reduce the significance of effects. Further analysis will be undertaken to determine indicative requirements for mitigation. The results of the analysis will be presented in the ES.

13.10.7 The mitigation strategy to be implemented during the operation phase may be subject to further refinement based on the final selection of plant and further detailed noise assessment work. Therefore, the requirements for mitigation will be confirmed in an ONMP.

## 13.11 Residual Effects and Conclusions

13.11.1 A summary of residual effects indicated by the preliminary assessment presented here are provided in **Table 13-24** and **Table 13-25**, below, for the construction phase and operational phase, respectively.

*Table 13-24: Summary of Residual Effects (Construction and Decommissioning)*

Receptor	Description of Impact	Significance of effect without mitigation	Mitigation/Enhancement measure	Residual effect after mitigation
<b>All dwellings identified in Table 13-17 (Receptors R02 – R20)</b>	Impacts due to airborne noise from construction activities.	<b>Not Significant</b>	No additional mitigation. However, construction phase effects will be controlled through the detailed CEMP.	<b>Not Significant</b>
<b>R16 (and any other</b>	Impacts due to airborne	<b>Potentially Significant</b>	Selection of quieter construction plant.	<b>Not Significant</b>

Receptor	Description of Impact	Significance of effect without mitigation	Mitigation/Enhancement measure	Residual effect after mitigation
<b>dwelling in sufficiently close proximity to HDD sites)</b>	noise from construction activities during the night-time.		Installation of temporary acoustic screening close to the construction plant.	
<b>All other dwellings identified in Table 13-17</b>	Impacts due to airborne noise from construction activities during the night-time.	<b>Not Significant</b>	No additional mitigation. However, construction phase effects will be controlled through the detailed CEMP.	<b>Not Significant</b>
<b>Wales Coast Path (Receptor R01)</b>	Impacts due to airborne noise from construction activities.	<b>Not Significant</b>	No additional mitigation. However, construction phase effects will be controlled through the detailed CEMP.	<b>Not Significant</b>
<b>R08 (and any other dwellings in sufficiently close proximity to impact piling to result in moderate effects to</b>	Impacts due to groundborne vibration from construction activities.	<b>Potentially Significant</b>	Informing residents of the nature and duration of the proposed works. Requirement to inform residents of the works where moderate effects to human perception are predicted will be set out in the oCEMP.	<b>Not Significant</b>

Receptor	Description of Impact	Significance of effect without mitigation	Mitigation/Enhancement measure	Residual effect after mitigation
<b>human perception)</b>				
<b>All other dwellings identified in Table 13-17 (Receptors R02 –R07 and R09 – R20)</b>	Impacts due to groundborne vibration from construction activities.	<b>Not Significant</b>	No additional mitigation.	<b>Not Significant</b>

Table 13-25: Summary of Residual Effects (Operation)

Receptor	Description of Impact	Significance of effect without mitigation	Mitigation/Enhancement measure	Residual effect after mitigation
<b>All dwellings identified in Table 13-17 (Receptors R02 – R20)</b>	Impacts due to operational noise during the daytime.	<b>Not Significant</b>	No additional mitigation	<b>Not Significant</b>
<b>Approximately one quarter of the dwellings identified in Table 13-17</b>	Impacts due to operational noise during the evening.	<b>Significant or potentially significant</b>	Mitigation to the fixed plant to reduce operational noise levels.  Indicative requirements for mitigation measures to control operational noise will be set out in the ES.	<b>Not Significant</b>

Receptor	Description of Impact	Significance of effect without mitigation	Mitigation/Enhancement measure	Residual effect after mitigation
			The requirements for mitigation will be confirmed in an ONMP.	
<b>Other dwellings identified in Table 13-17</b>	Impacts due to operational noise during the evening.	<b>Not Significant</b>	No additional mitigation	<b>Not Significant</b>
<b>Majority of dwellings identified in Table 13-17</b>	Impacts due to operational noise during the night-time.	<b>Significant or Potentially Significant</b>	Mitigation to the fixed plant to reduce operational noise levels.  Indicative requirements for mitigation measures to control operational noise will be confirmed in the ES.  The requirements for mitigation will be confirmed in an ONMP.	<b>Not Significant</b>
<b>Two of the dwellings identified in Table 13-17</b>	Impacts due to operational noise during the night-time.	<b>Not Significant</b>	No additional mitigation	<b>Not Significant</b>

Receptor	Description of Impact	Significance of effect without mitigation	Mitigation/Enhancement measure	Residual effect after mitigation
<b>Wales Coast Path</b>	Impacts due to operational noise.	<b>Not Significant</b>	No additional mitigation	<b>Not Significant</b>

## 13.12 Cumulative Effects

13.12.1 A preliminary review of cumulative developments within 1km of the PEIR Assessment Boundary (**Figure 1-1**) has been undertaken and is presented in **Table 13-26**, below.

*Table 13-26: Cumulative Developments within 1km of the Proposed Development*

Planning Authority	Application Ref.	Location/ Address	Development Summary	Potential for significant cumulative effects
<b>Newport City Council</b>	24/0301	Llanwern Works Queensway Llanwern Newport South Wales NP19 4QZ	Reserved matters applications relating to layout, scale, access, appearance and	These developments in the Llanwern Works are >1km from any receptor identified in <b>Table 13-17</b> . Therefore, cumulative effects arising from construction and operation phase activities at the development sites are negligible.
<b>Newport City Council</b>	25/0176	Llanwern Works Queensway Llanwern Newport South Wales NP19 4QZ	landscaping of different elements consented in outline planning permission 06/0471	There is potential for cumulative road traffic noise effects. Cumulative road traffic noise effects will be assessed in the ES, as outlined in

Planning Authority	Application Ref.	Location/ Address	Development Summary	Potential for significant cumulative effects
<b>Newport City Council</b>	25/0177	Llanwern Works Queensway Llanwern Newport South Wales NP19 4QZ		<b>Chapter 15: Transport and Access.</b>
<b>Newport City Council</b>	25/0152	Glan Llyn Development Site Phase 4E/4G Queensway Llanwern Newport South Wales		
<b>Newport City Council</b>	25/0052	Llanwern Works Queensway Llanwern Newport South Wales NP19 4QZ	Open storage and distribution facility.	<p>The development site is &gt;1km from any receptor identified in <b>Table 13-17</b>. Therefore, potential for cumulative effects arising from construction and operation phase activities at the development site is negligible.</p> <p>There is potential for cumulative road traffic noise effects. Cumulative road traffic noise effects will be assessed in the ES, as outlined in</p>

Planning Authority	Application Ref.	Location/ Address	Development Summary	Potential for significant cumulative effects
				<b>Chapter 15: Transport and Access .</b>
<b>Newport City Council</b>	22/0349	Land On The North Side Of Bareland Street Magor Newport South Wales	Reserved matters applications relating to consented industrial building, offices and associated works.	<p>The development site is approximately 1km from R07 identified in <b>Table 13-17</b>. Therefore, potential for cumulative effects arising from construction and operation phase activities at the development site is negligible.</p> <p>There is potential for cumulative road traffic noise effects. Cumulative road traffic noise effects will be assessed in the ES, as outlined in <b>Chapter 15: Transport and Access .</b></p>
<b>Newport City Council</b>	23/0440	Phase 4D Glan Llyn Development Site Queensway Llanwern Newport South Wales	Reserved matters applications relating to consented industrial building, offices and associated works.	<p>The development site is &gt;1km from any receptor identified in <b>Table 13-17</b>. Therefore, potential for cumulative effects arising from construction and operation phase activities at the development site is negligible.</p> <p>There is potential for cumulative road traffic noise</p>

Planning Authority	Application Ref.	Location/ Address	Development Summary	Potential for significant cumulative effects
				effects. Cumulative road traffic noise effects will be assessed in the ES, as outlined in <b>Chapter 15: Transport and Access</b> .
<b>Monmouthshire County Council</b>	DM/2023/01479	1 Priory Court Magor Caldicot Monmouthshire NP26 3LY	Tree height reduction.	No potential for significant cumulative effects.
<b>Monmouthshire County Council</b>	DM/2023/00161	Lower Grange Farm Whitewall Magor Caldicot Monmouthshire NP26 3DE	Barn conversion into annex.	No potential for significant cumulative effects.
<b>Monmouthshire County Council</b>	DM/2022/01490	Magor Pill Farm Whitewall Magor Caldicot Monmouthshire NP26 3EE	Change of use of 2 no. bays from agricultural to B2/B8 uses.	Development is of small scale and unlikely to give rise to significant noise or vibration during construction or operation. No potential for significant cumulative effects.
<b>Monmouthshire County Council</b>	DM/2025/00147	Land Off Norton Lane Whitewall Undy	Agricultural building for storage of	Development is of small scale and unlikely to give rise to significant noise or vibration during construction or

Planning Authority	Application Ref.	Location/ Address	Development Summary	Potential for significant cumulative effects
		Monmouths hire	plant and farm machinery.	operation. No potential for significant cumulative effects.
<b>Monmouthshire County Council</b>	DM/2020/01 639	Land Near Rush Wall Lane Green Moor Lane Magor Monmouths hire	Retrospective planning permission for an underground HV cable and ancillary GRP substation.	No potential for significant cumulative effects.
<b>Monmouthshire County Council</b>	DM/2021/00 293	Great House Farm The Elm To Bridgend Farm Undy Caldicot Monmouths hire NP26 3EN	Retrospective planning consent for the change of use of former agricultural buildings to a B2 vehicle repair/restoration. Erection of security gates at the site entrance.	The development site is >1km from any receptor identified in <b>Table 13-17</b> . Development is of small scale and unlikely to give rise to significant noise or vibration during construction or operation. No potential for significant cumulative effects.
<b>Monmouthshire County Council</b>	DM/2024/01 492	Great House Farm The Elm To Bridgend Farm Undy Monmouths	Erection of a building to be used as a Class 7 MOT station and workshop.	The development site is >1km from any receptor identified in <b>Table 13-17</b> . Development is of small scale and unlikely to give rise to significant noise or vibration during construction or

Planning Authority	Application Ref.	Location/ Address	Development Summary	Potential for significant cumulative effects
		hire NP26 3EN		operation. No potential for significant cumulative effects.
<b>Monmouthshire County Council</b>	DM/2022/00690	Three Fields Site Main Road Undy Monmouths hire	Air Source Heat Pump and Mechanical Ventilation at Magor and Undy Community Hub.	The development site is >1km from any receptor identified in <b>Table 13-17</b> . Development is of small scale and unlikely to give rise to significant noise or vibration during construction or operation. No potential for significant cumulative effects.
<b>Monmouthshire County Council</b>	DM/2023/00387	Three Fields Site Main Road Undy Monmouths hire	Non-material amendment relating to Air Source Heat Pump and Mechanical Ventilation at Magor and Undy Community Hub.	
<b>Monmouthshire County Council</b>	DM/2023/01031	Development At Pathways Vinegar Hill Undy Monmouths hire	Revised CTMP for planning decision DM/2021/01000.	The development site is >1km from any receptor identified in <b>Table 13-17</b> . Development is of small scale and unlikely to give rise to significant noise or vibration during construction or operation. No potential for significant cumulative effects.

Planning Authority	Application Ref.	Location/ Address	Development Summary	Potential for significant cumulative effects
<b>Monmouthshire County Council</b>	DM/2021/00358	Land At Rockfield Farm Silurian Road Undy Monmouthshire	Provision of 5575m <sup>2</sup> B1 employment space on parcel C1.	<p>The development site is &gt;1km from any receptor identified in <b>Table 13-17</b>. Therefore, potential for cumulative effects arising from construction and operation phase activities at the development site is negligible.</p> <p>The potential for cumulative road traffic noise effects is considered low as the development site is adjacent to the M4.</p>
<b>Monmouthshire County Council</b>	DM/2021/00357	Magor House The Square Magor NP26 3HY	Rear garden to Magor House with new dwelling in accordance with planning approval DC/2015/00167 and listed building consent DC/2015/00167.	The development site is >1km from any receptor identified in <b>Table 13-11</b> . Development is of small scale and unlikely to give rise to significant noise or vibration during construction or operation. No potential for significant cumulative effects.
<b>Monmouthshire County Council</b>	DNS CAS-01960-J2H3X5 - Magor Net Zero	Land between the M4 Motorway and the	Renewable Energy & Green Hydrogen Production	Based on review of the EIA Scoping Report ( <b>Appendix 1C</b> ) for the development, it is considered there could be the potential for significant

Planning Authority	Application Ref.	Location/ Address	Development Summary	Potential for significant cumulative effects
		South Wales Main Line Railway, near Llanwern, Underwood and Bishton	Facility including ground-mounted Solar Panels, wind turbine, hydrogen electrolyzers, hydrogen and energy storage and ancillary and associated infrastructure and cabling.	cumulative effects during the construction and operation of the development. The information currently available is insufficient to undertake an assessment of cumulative effects. An assessment of potentially significant cumulative effects will be provided in the ES, subject to availability of appropriate information.
<b>Newport City Council</b>	DNS/32204 57 - Rush Wall Solar Park Ltd	Land near the village of Redwick, south east of Newport, Wales on the Caldicot Levels	The installation of a solar park with an approximate design capacity of 75MW. Development includes ancillary electrical equipment and infrastructure, access tracks, security fencing and CCTV.	Based on review of the Noise and Vibration ES Chapter (Ref 13-24) for the development, it is considered there is negligible potential for significant cumulative effects during the construction and operation of the development. This is on the basis that predicted noise levels during the construction and operation of the development at all receptor locations assessed (but particularly dwellings in the same area: receptors near R15 and R16 identified in <b>Table 13-14</b> ) are significantly below the respective

Planning Authority	Application Ref.	Location/ Address	Development Summary	Potential for significant cumulative effects
				<p>thresholds of significance. Therefore, noise from the construction and operation of the development does not have the potential to contribute to a cumulative level that could give rise to significant cumulative effects.</p>

### 13.13 Summary and Next Steps

13.13.1 A preliminary assessment of the likely noise and vibration effects arising from the construction and operation of the Proposed Development has been undertaken.

13.13.2 As set out in **Section 13.3**, there is currently insufficient information to assess potential increases of road noise on the local highway network due to construction traffic. An assessment of this aspect will be provided in the ES.

13.13.3 The preliminary assessment of construction phase effects indicates that, without additional mitigation measures, likely significant effects could occur at nearby dwellings during the night-time due to HDD activities. Suitable additional mitigation measures for controlling HDD activity noise have been set out in **Section 13.10**, which includes selection of quieter construction plant and the installation of temporary acoustic screening close to the construction plant. An assessment of cumulative effects from multiple HDD sites will be presented in the ES. The preliminary construction noise assessment also indicates that should percussive piling be required, there could be potentially significant effects in terms of human perception, but no significant effects in terms of building damage. To ensure effects to human perception are not significant, residents in close proximity to percussive piling should be informed of the nature and duration of the proposed works. The requirement for this is detailed in the oCEMP supporting this PEIR, an oCEMP will be submitted with the ES.

13.13.4 Once a construction Contractor is appointed, further assessment of potential

construction phase impacts should be undertaken. The further assessment, based on detailed construction information, should define the requirements for mitigation which will be presented in the detailed CEMP.

- 13.13.5 To inform the preliminary assessment of operational noise, operational noise levels have been predicted assuming all plant is operating at maximum duty at all times of day. It is expected that noise emissions from the inverters and intermediate transformers will be reduced during hours of darkness. As the predicted operational noise levels are preliminary, a largely qualitative assessment is presented in the PEIR. A quantitative assessment will be provided in the ES. Subject to the provision of suitable data, the quantitative assessment presented in the ES will take account of anticipated variations in operational noise at different times of day.
- 13.13.6 The preliminary assessment of operational phase effects indicates that, without additional mitigation measures, likely significant effects could occur at nearby dwellings during the evening and night-time. Noise control measures for fixed plant can be specified in order to reduce and avoid the significant effects identified. Indicative requirements for mitigation measures to control operational noise will be outlined in the ES and the final mitigation strategy confirmed in an updated ONMP. Subject to the implementation of the mitigation strategy in the updated ONMP, no significant effects at dwellings due to operational noise would occur.
- 13.13.7 An assessment of operational noise effects at the Wales Coast Path indicates that, without additional mitigation, there would not be any significant effects to users of the path. However, as additional mitigation is required to reduce operational noise at dwellings, operational noise levels at the Wales Coast Path will likely be lower than those assessed. The updated assessment will be presented in the ES.
- 13.13.8 An initial review of potential cumulative effects indicates that the only development with the potential to give rise to significant cumulative effects is the Magor Net Zero development. However, at this time, there is currently insufficient information available on the Magor Net Zero development to assess the likelihood of cumulative effects. Subject to the availability of appropriate information, assessment of likely significant cumulative effects will be presented in the ES.

## 13.14 References

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- Ref 13-2 Environmental Protection Act 1990, c. 43. Available at: <https://www.legislation.gov.uk/ukpga/1990/43/contents> (Accessed: 17 November 2025)
- Ref 13-3 Department of Energy and Climate Change (2011) Overarching National Policy Statement for Energy (EN-1), [Online], Available at: <https://www.gov.uk/government/publications/overarching-national-policy-statement-for-energy-en-1> [Accessed October 2025].
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- Ref 13-10 British Standards Institution (BSI, 2014). *British Standard BS 8233:2014 Guidance on sound insulation and noise reduction for buildings*. BSI; London.
- Ref 13-11 British Standards Institution (BSI). (2014). *BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part*

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- Ref 13-12 British Standards Institution (BSI, 2014). British Standard BS 5228-2:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration. BSI; London.
- Ref 13-13 Welsh Government (2018). Noise and Soundscape action Plan for Wales 2018 – 20223. [Online] Available at: <https://www.gov.wales/sites/default/files/publications/2019-04/noise-and-soundscape-action-plan.pdf> (Accessed 24 November 2023)
- Ref 13-14 Welsh Government (2023). Noise and Soundscape Plan for Wales 2023-2028, Our national strategy on soundscapes, Consultation draft. [Online] Available at: <https://www.gov.wales/sites/default/files/consultations/2023-06/draft-noise-and-soundscape-plan-for-wales.pdf> (Accessed 23 October 2025).
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