codling wind park

Environmental Impact Assessment Report

Volume 4

Appendix 24.2 Representative Scenario and Limits of Deviation Assessment


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APPENDIX 24.2 REPRESENTATIVE SCENARIO AND LIMITS OF DEVIATION ASSESSMENT

1 Introduction

1. Complex, large-scale infrastructure projects with a terrestrial and marine interface such as the CWP Project, are consented and constructed over extended timeframes. The ability to adapt to changing supply chain, policy or environmental conditions and to make use of the best available information to feed into project design, promotes environmentally sound and sustainable development. This ultimately reduces project development costs and therefore electricity costs for consumers and reduces CO_2 emissions.

2. Case law recognises that the plans and particulars submitted with planning applications can allow for a certain limited flexibility, where this is applied reasonably and, in a context-specific way. In addition, section 287A of the Planning and Development Act (PDA) (as inserted by the Planning and Development, Maritime and Valuation (Amendment) Act 2022) has expanded the flexibility available and allows planning applications to be made and decided before the Applicant has confirmed certain details of the project.

3. Due to the complexity of the Codling Wind Park (CWP) Project, significant and rapid progression in wind farm technology development, potential changes in environmental conditions and in policy and legislation, the Applicant considers that consenting a degree of design flexibility is appropriate and legally compliant.

4. In this regard the approach to the design development of the CWP Project has sought to introduce flexibility where required to enable the best available technology to be constructed, whilst at the same time to specify project boundaries, project components and project parameters wherever possible, whilst having regard to known environmental constraints.

2 Approach to Presenting the Project Design

5. The approach to the design development of the CWP Project considers permanent infrastructure, temporary infrastructure and installation methods.

6. In general, the CWP Project has sought to specify the location, scale and extents of permanent and temporary infrastructure, however in some cases a degree of design flexibility is required. Subject to the detail concerned, this flexibility is presented in three ways:

   - **Options**: Consent is sought for up to two options for certain permanent infrastructure details and layouts, for example, wind turbine generator (WTG) Layout Option A (250 m rotor diameter) or WTG Option B (276 m rotor diameter). Each design option is described in detail in **Chapter 4 Project Description**, which provides the details associated with each option.
   - **Dimensional flexibility**: Dimensional flexibility is described as a limited parameter range i.e. upper (maximum) and lower (minimum) values for a given detail such as cable length.
   - **Locational flexibility**: Locational flexibility of permanent infrastructure is described as Limit of Deviation (LoD) from a specific point or alignment.

7. Installation methods for permanent infrastructure have been identified and described in full, however, as with the design of permanent infrastructure, a degree of flexibility is required as final decisions on

methods and techniques to be employed will not be made until the appointment of the primary contractors closer to the time of construction.

8. Where required, flexibility concerning installation methods is presented by means of options. The details associated with the installation methods are specified, where possible, or otherwise described as a limited parameter range i.e. upper (maximum) and lower (minimum) values for a given detail such.

3 Representative Scenario Assessment

9. The CWP Project Environmental Impact Assessment Report (EIAR) will identify, describe and assess all of the likely significant effects of the proposed development on the environment. To achieve this for all options and dimensional flexibility, and at the same time to produce application documents that are concise and readable, each chapter of the EIAR will assess a selection of representative scenarios, rather than assessing every possible scenario. A “representative scenario” is a combination of options and dimensional flexibility that has been selected to represent all of the likely significant effects of the project on the environment. Some topics may require several representative scenarios to be identified to ensure all impacts are identified, described and assessed.

10. For Noise and Vibration this analysis for construction and operation and maintenance (O&M) phase impacts is presented in**Table 1** and **Table 2**, respectively. Each table identifies one or more representative scenarios for each impact with supporting text to demonstrate that no other scenarios would give rise to new or materially different effects; taking into consideration the potential impact of other scenarios on the magnitude of the impact or the sensitivity of the receptor(s) that is being considered.

11. Where the potential for a new or materially different impact is identified, then further representative scenarios must be assessed in full within the main chapter.

12. This is distinct from the approach to assessing locational flexibility, where differences in impacts are assessed in this Appendix. The difference in approaches arises because there is a much higher degree of confidence in the locations and alignments assessed in the main chapter than there is for the final options and dimensions.

13. Overall, this approach will ensure that the EIAR will identify, describe and assess:

- Every impact type that could arise from the proposed development, taking account of the full range of options and dimensional flexibility;
- Every materially different magnitude of impact that could arise from the proposed development within the proposed options and dimensional flexibility; and
- Every materially different sensitivity of receptor that could arise from the proposed development within the proposed options and dimensional flexibility.

Table 1 Representative scenario assessment - construction phase impacts

Impact	Relevant project details			Representative scenario(s) and notes / assumptions	Rationale for representative scenario(s)	
Impact 13: Temporary noise level at onshore NSLs associated with the OWF WTG monopiling (Note – for all other construction phase impacts there is one design / installation scenario as presented in EIAR **Chapter 24 Noise and Vibration**)	WTGs	WTG Option A	WTG Option B		Questions to demonstrate assessment has considered all scenarios	Response
	Installation methods and effects			Comparable sound power level used in both options but both scenarios are assessed to account for difference in distance of closest turbine to closest onshore noise sensitive receiver.	*1. Are there infrastructure layout options (permanent or temporary) which may introduce new impacts?* *Note - this could be a new impact entirely or the introduction of an existing impact pathway to a new receptor.* *2. Are there infrastructure layout options (permanent or temporary) which may introduce a materially different magnitude of impact?* *3. Are there infrastructure layout options (permanent or temporary) which may introduce a material change in the sensitivity of the receptor(s) (greater or lesser)?* *4. Are there alternative installation methods which may introduce new impacts?* *5. Are there alternative installation methods which may introduce a materially different magnitude of impact?* *6. Are there alternative installation methods which may materially alter the sensitivity of the relevant receptor(s) (greater or lesser).*	1. N/A – both layout options assessed. 2. N/A – both layout options assessed. 3. N/A – both layout options assessed. 4. N/A – no alternative installation methods proposed. 5. N/A – no alternative installation methods proposed. 6. N/A – no alternative installation methods proposed.
	Monopiling	145 dB (A) sound power level	145 dB (A) sound power level			

Table 2 Representative scenario assessment - operational phase impacts

Impact	Relevant project details			Representative scenario(s) and notes / assumptions	Rationale for representative scenario(s)	
Impact 14: Permanent noise level at onshore NSLs associated with the OWF turbines (Note – for all other O&M phase impacts there is one design / operation scenario as presented in EIAR **Chapter 24 Noise and Vibration**)	WTGs	Option A	Option B		Questions to demonstrate assessment has considered all scenarios	Response
	Permanent infrastructure			Due to the difference in the number of turbines, hub height and sound power of the two WTG options, both scenarios are assessed.	*1. Are there infrastructure layout options (permanent or temporary) which may introduce new impacts?* *Note - this could be a new impact entirely or the introduction of an existing impact pathway to a new receptor.* *2. Are there infrastructure layout options (permanent or temporary) which may introduce a materially different magnitude of impact?* *3. Are there infrastructure layout options (permanent or temporary) which may introduce a material change in the sensitivity of the receptor(s) (greater or lesser)?* *4. Are there alternative installation methods which may introduce new impacts?* *5. Are there alternative installation methods which may introduce a materially different magnitude of impact?* *6. Are there alternative installation methods which may materially alter the sensitivity of the relevant receptor(s) (greater or lesser).*	1. N/A – both layout options assessed. 2. N/A – both layout options assessed. 3. N/A – both layout options assessed. 4. N/A – no alternative installation methods proposed. 5. N/A – no alternative installation methods proposed. 6. N/A – no alternative installation methods proposed.
	No. of WTG	75	60			
	Hub height above LAT (m)	163	176			
	Rated sound power (dB L_{WA})	115	120.9			

4 Limit of Deviation Assessment

14. As described in **Section 2** of this document, locational flexibility of permanent and temporary infrastructure is described as a LoD from a specific point or alignment.

15. The project components for which a LoD has been defined are presented in **Table 3**. These are further described in EIAR **Chapter 4 Project Description** and have been presented on the planning drawings that accompany the planning application.

Table 3 Defined limits of deviation

Project component	LoD
Offshore project components	
WTGs	100m buffer from the centre point of each WTG location
WTG monopile locations	Same as WTGs.
WTG monopile scour protection	Same as WTGs.
OSSs	100m from the centre point of each OSS location
OSS monopile locations	Same as OSSs.
OSS monopile scour protection	Same as OSSs.
IACs and interconnector cables	100m either side of the preferred alignment of each IAC and interconnector cable 200m from the centre point of each WTG location
Offshore export cables	250 m either side of the preferred alignment within the array site. The offshore export cable corridor (OECC) outside of the array site.
Landfall	
TJBs	0.5 m either side (i.e. east / west) of the preferred TJB location
Landfall cable ducts (and associated offshore export cables within the ducts)	Defined LoD boundary with 30 – 55 m horizontal width
Intertidal cable ducts (and associated offshore export cables within the ducts)	The OECC
Intertidal offshore export cables (non ducted sections)	The OECC
Onshore substation	
Location of onshore substation revetment perimeter structure	Defined LoD for sheet piling at toe of the revetement with 0.5 – 1.0 m horizontal width

16. For the purposes of the EIAR, the main chapter for noise and vibration assesses the specific preferred location for permanent infrastructure. However, this document provides further analysis to determine

if the proposed LoD for permanent infrastructure may give rise to any new or materially different effects, taking into consideration the potential impact of the proposed LoD on the magnitude of the impact.

17. For noise and vibration this analysis for construction and O&M phase impacts is presented in **Table 4** and **Table 5**, respectively. Where the potential for a LoD to cause a new or materially different effect is identified, then this is noted in the tables below and is considered in full within the main chapter.

Table 4 Limit of deviation assessment - construction phase impacts

Impact	Relevant project element	Limit of deviation	Questions to demonstrate assessment has considered all scenarios	Response
Impact 1: Temporary noise level at NSLs associated with the landfall cable duct installation	n/a		n/a	n/a
Impact 2: Temporary noise level at NSLs associated with the landfall works	Landfall		*1. Does the proposed LoD (locational flexibility) introduce new impacts? (i.e. the introduction of an existing impact pathway to a new receptor).* *2. Does the proposed LoD (locational flexibility) introduce a materially different magnitude of impact?*	1. No, the implementation of the LoD does not introduce any new impact receptor pathways that have not already been considered as part of the assessment. 2. No, due to the propagation of sound over distance the modelled noise sources would need to reduce their distance to receivers by half to lead to a 6 dB increase in noise levels. For example a 3 dB increase in the predicted noise levels, which is subjectively just noticeable, would require the defined TJB piling boundaries to move 120 m closer to the residential receivers to the west. The implementation of the LoD does not therefore alter the assigned magnitude of the impact.
	TJBs	0.5 m either side (i.e. east / west) of the preferred TJB location		
Impact 3: Temporary noise level at NSLs associated with the intertidal works	Tensioner platforms	The OECC	*1. Does the proposed LoD (locational flexibility) introduce new impacts? (i.e. the introduction of an existing impact pathway to a new receptor).* *2. Does the proposed LoD (locational flexibility) introduce a materially different magnitude of impact?*	1. No, the implementation of the LoD does not introduce any new impact receptor pathways that have not already been considered as part of the assessment. 2. No, due to the propagation of sound over distance the modelled noise sources would need to reduce their distance to receivers by half to lead to a 6 dB increase in noise levels. For example a 3 dB increase in the predicted noise levels, which is subjectively just noticeable, would require the defined tensioner platform piling boundaries to move 200 m closer to the residential receivers. The implementation of the LoD does not therefore alter the assigned magnitude of the impact.
Impact 4: Temporary noise level at NSLs associated with the onshore export cable works	n/a	n/a	n/a	n/a
Impact 5: Temporary noise level at NSLs associated with the onshore substation works	Onshore substation		*1. Does the proposed LoD (locational flexibility) introduce new impacts? (i.e. the introduction of an existing impact pathway to a new receptor).* *2. Does the proposed LoD (locational flexibility) introduce a materially different magnitude of impact?*	1. No, the implementation of the LoD does not introduce any new impact receptor pathways that have not already been considered as part of the assessment. 2. No, due to the propagation of sound over distance the modelled noise sources would need to reduce their distance to receivers by half to lead to a 6 dB increase in noise levels. For example a 3 dB increase in the predicted noise levels, which is subjectively just noticeable, would require the defined substation piling boundaries to move 250m closer to the residential receivers. The implementation of the LoD does not therefore alter the assigned magnitude of the impact.
	Piling works at substation,	Defined LoD for sheet piling at toe of the revetement		
Impact 6: Temporary noise level at NSLs associated	n/a		n/a	n/a

Impact	Relevant project element	Limit of deviation	Questions to demonstrate assessment has considered all scenarios	Response
with the ESBN network cable works				
Impact 7: Temporary vibration effects at VSRs associated with landfall works	Landfall		*1. Does the proposed LoD (locational flexibility) introduce new impacts? (i.e. the introduction of an existing impact pathway to a new receptor).* *2. Does the proposed LoD (locational flexibility) introduce a materially different magnitude of impact?*	1. No, the implementation of the LoD does not introduce any new impact receptor pathways that have not already been considered as part of the assessment. 2. No, due to the distances involved the predicted vibration levels are orders of magnitude below the vibration criteria outlined in Table 24.7 in Chapter 24 Noise and Vibration. The implementation of the LoD does not therefore alter the assigned magnitude of the impact.
	TJBs	0.5 m either side (i.e. east / west) of the preferred TJB location		
Impact 8: Temporary vibration effects at VSRs associated with intertidal works	Tensioner platforms	The OECC	*1. Does the proposed LoD (locational flexibility) introduce new impacts? (i.e. the introduction of an existing impact pathway to a new receptor).* *2. Does the proposed LoD (locational flexibility) introduce a materially different magnitude of impact?*	1. No, the implementation of the LoD does not introduce any new impact receptor pathways that have not already been considered as part of the assessment. 2. No, due to the distances involved the predicted vibration levels are orders of magnitude below the vibration criteria outlined in Table 24.7 in Chapter 24 Noise and Vibration. The implementation of the LoD does not therefore alter the assigned magnitude of the impact.
Impact 9: Temporary vibration effects at VSRs associated with onshore export cable works	n/a	n/a	n/a	n/a
Impact 10: Temporary vibration effects at VSRs associated with the onshore substation works	Onshore substation		*1. Does the proposed LoD (locational flexibility) introduce new impacts? (i.e. the introduction of an existing impact pathway to a new receptor).* *2. Does the proposed LoD (locational flexibility) introduce a materially different magnitude of impact?*	1. No, the implementation of the LoD does not introduce any new impact receptor pathways that have not already been considered as part of the assessment. 2. No, due to the distances involved the predicted vibration levels are orders of magnitude below the vibration criteria outlined in Table 24.7 in Chapter 24 Noise and Vibration. The implementation of the LoD does not therefore alter the assigned magnitude of the impact.
	Piling works at substation	Defined LoD for sheet piling at toe of the revetement		
Impact 11: Temporary vibration effects at VSRs associated with the ESBN network cable works	n/a		n/a	n/a
Impact 12: Temporary road traffic noise level at NSLs due to construction traffic	n/a		n/a	n/a
Impact 13: Temporary noise level at onshore NSLs associated with the WTG monopiling	Offshore		*1. Does the proposed LoD (locational flexibility) introduce new impacts? (i.e. the introduction of an existing impact pathway to a new receptor).* *2. Does the proposed LoD (locational flexibility) introduce a materially different magnitude of impact?*	1. No, the implementation of the LoD does not introduce any new impact receptor pathways that have not already been considered as part of the assessment. 2. No, due to the propagation of sound over distance the modelled noise sources are at least 13000m away from the
	WTG monopile locations	100m buffer from the centre point of each WTG location		

Impact	Relevant project element	Limit of deviation	Questions to demonstrate assessment has considered all scenarios	Response
				closest onshore noise sensitive location. The implementation of the LoD does not therefore alter the assigned magnitude of the impact.

Table 5 Limit of deviation assessment - operational phase impacts

Impact	Relevant project element	Limit of deviation	Questions to demonstrate assessment has considered all scenarios	Response
Impact 14: Permanent noise level at onshore NSLs associated with the WTG	**Offshore**		*1. Does the proposed LoD (locational flexibility) introduce new impacts? (i.e. the introduction of an existing impact pathway to a new receptor).* *2. Does the proposed LoD (locational flexibility) introduce a materially different magnitude of impact?*	1. No, the implementation of the LoD does not introduce any new impact receptor pathways that have not already been considered as part of the assessment. 2. No, due to the propagation of sound over distance the modelled noise sources are at least 13000m away from the closest onshore noise sensitive location. The implementation of the LoD does not therefore alter the assigned magnitude of the impact.
	WTGs	100m buffer from the centre point of each WTG location		
Impact 15: Permanent noise level at NSLs associated with the onshore substation operational plant	n/a	n/a	n/a	n/a