codling wind park

Environmental Impact Assessment Report

Volume 4

Appendix 24.1 Cumulative Effects Assessment


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Abbreviations

Abbreviation	Term in Full
BS	British standard
CEA	Cumulative effects assessment
CWP	Codling Wind Park
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EPA	Environmental Protection Agency
ESB	Electricity Supply Board
ESBN	ESB Networks
EU	European Union
HDD	Horizontal directional drilling
OTI	Onshore transmission infrastructure
OWF	Offshore wind farm
O&M	Operations and maintenance
PINS	Planning Inspectorate

Definitions

Glossary	Meaning
the Applicant	The developer, Codling Wind Park Limited (CWPL).
Background noise level, $L_{A90, T}$	The A-weighted sound pressure level that is exceeded by the residual sound at the assessment location for 90% of a given time interval, T. This level is expressed using the L_{A90} parameter. These levels were measured as part of the baseline survey.
CNT	Construction Noise Thresholds
Codling Wind Park (CWP) Project	The proposed development as a whole is referred to as the Codling Wind Park (CWP) Project, comprising of the offshore infrastructure, the onshore infrastructure and any associated temporary works.
Codling Wind Park Limited (CWPL)	A joint venture between Fred. Olsen Seawind (FOS) and Électricité de France (EDF) Renewables, established to develop the CWP Project.
dB	Decibel - The scale in which sound pressure level is expressed. It is defined as 20 times the logarithm of the ratio between the RMS pressure of the sound field and the reference pressure of 20 micro-pascals (20μPa).
dB(A)	An 'A-weighted decibel' - a measure of the overall noise level of sound across the audible frequency range (20 Hz – 20 kHz) with A-frequency weighting (i.e. 'A'–weighting) to compensate for the varying sensitivity of the human ear to sound at different frequencies.
EirGrid	State-owned electric power transmission system operator in Ireland and nominated Offshore Transmission Asset Owner
ESB Networks (ESBN)	Owner of the electricity distribution system in the Republic of Ireland, responsible for carrying out maintenance, repairs and construction on the grid.
Hz	Hertz: The unit of sound frequency in cycles per second
$L_{Aeq,T}$	is the equivalent continuous sound level. It is a type of average and is used to describe a fluctuating noise in terms of a single noise level over the sample period (T).
L_{A90}	is the sound level that is exceeded for 90% of the sample period. It is typically used as a descriptor for background noise.
Maritime Area Planning (MAP) Act 2021	An Act to regulate the maritime area, to achieve such regulation by means of a National Marine Planning Framework, maritime area consents for the occupation of the maritime area for the purposes of maritime usages that will be undertaken for undefined or relatively long periods of time (including any such usages which also require development permission under the Planning and Development Act 2000) and licences for the occupation of the maritime area for maritime usages that are minor or that will be undertaken for relatively short periods of time
NSL	Noise Sensitive Location: Any dwelling house, hotel or hostel, health building, educational establishment, place of worship or entertainment,

Glossary	Meaning
	or any other facility or other area of high amenity which for its proper enjoyment requires the absence of noise at nuisance levels.
onshore transmission infrastructure (OTI)	The onshore transmission assets comprising the TJBs, onshore export cables, and the onshore substation. The EIAR considers both permanent and temporary works associated with the OTI.
onshore substation	Site containing electrical equipment to enable connection to the national grid.
onshore substation site	The area within which permanent and temporary works will be undertaken to construction the onshore substation.
Pa	Pascal, the SI unit of pressure
Poolbeg 220kV substation	The ESBN substation that the ESBN network cables connect into, from the onshore substation. This substation will then transfer the electricity onwards to the national grid
PPV	Peak Particle Velocity is a measure of the velocity of vibration displacement in terms of millimetres per second (mm/s). It is defined as follows within BS 7385-2 (BSI 1993) as 'the maximum instantaneous velocity of a particle at a point during a given time interval'
Rating level, $L_{Ar, T}$	The specific noise level plus adjustments for the character features of the sound (if any).
Specific noise level, $L_{Aeq, T}$	The equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment location over a given reference time interval, T.
SPL	Sound Pressure Level typically expressed in Decibels
VDV	Vibration Dose Value (VDV) is a cumulative measurement of vibration level over an 8-hour or 16 hour period.
WHO	World Health Organisation

APPENDIX 24.1 CUMULATIVE EFFECTS ASSESSMENT

1 Introduction

1. Codling Wind Park Limited (hereafter 'the Applicant') is proposing to develop the Codling Wind Park (CWP) Project, a proposed offshore wind farm (OWF) located in the Irish sea approximately 13–22 km off the east coast of Ireland, at County Wicklow.

2. The Environmental Impact Assessment Report (EIAR) for the CWP Project provides the decision-maker, stakeholders and all interested parties with the environmental information required to develop an informed view of any likely significant effects resulting from the CWP Project, as required by the European Union (EU) Directive 2011/92/EU (as amended by Directive 2014/52/EU) (the EIA Directive). These provisions are transposed into Irish legislation in Part X of the Planning and Development Act 2000, as amended, and in Part 10 of the Planning and Development Regulations 2001, as amended.

3. A fundamental component of the EIA is to consider and assess the potential for cumulative effects of the project with other projects, plans and activities (hereafter referred to as 'other development').

4. The Environmental Protection Agency (EPA) Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA, 2022) defines cumulative effects as:

> *"The addition of many minor or insignificant effects, including effects of other projects, to create larger, more significant effects.*
>
> *While a single activity may itself result in a minor impact, it may, when combined with other impacts (minor or insignificant), result in a cumulative impact that is collectively significant. For example, effects on traffic due to an individual industrial project may be acceptable; however, it may be necessary to assess the cumulative effects taking account of traffic generated by other permitted or planned projects."*

5. This appendix presents the findings of the Cumulative Effects Assessment (CEA) for noise and vibration, which considers the residual effects presented in Chapter 24 Noise and Vibration alongside the potential effects of other proposed and reasonably foreseeable development. Cumulative effects are considered in this document across the construction phase and the operation and maintenance phases of the CWP Project.

6. Project alone impacts during the decommissioning phase of the CWP Project are assessed in Chapter 24 Noise and Vibration. It is anticipated that the impacts will be no greater than those identified for the construction phase, and therefore no separate assessment of cumulative impacts during the decommissioning phase is presented within this CEA.

2 CEA methodology

2.1 Guidance

7. This section summarises the approach to the assessment of cumulative effects for the CWP Project. Further details on the approach to the CEA is provided in **Appendix 5.1 Cumulative Effects Assessment Methodology**.

8. The principal guidance document that has informed the approach to the CEA is the Planning Inspectorate (PINS) for England 'Advice Note 17: Cumulative Effects Assessment' (PINS, 2019), which provides a four-stage process for the assessment of cumulative effects.

9. This guidance has been applied for a number of both OWF and non-OWF projects in the UK, and is considered to provide developers with a structured approach to assessing cumulative effects. The guidance is also regularly applied in Ireland for large scale projects, noting that there is no single, industry standard approach to CEA in Ireland; approaches often vary between projects.

10. In developing the CEA methodology, EPA Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA, 2022) and Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions (European Commission, 1999) has also been considered.

2.2 Consultation

11. Stakeholder and regulator feedback received during the consultation process that is relevant to the noise and vibration assessment is provided in **Chapter 24 Noise and Vibration**.

12. No feedback specific to the CEA for noise and vibration has been received.

2.3 Identification of 'other development'

13. Stage 1 of the process involved establishing the 'long list' of other development with the potential to result in cumulative effects with the CWP Project. This included all projects that result in a comparative effect that is not intrinsically considered as part of the existing environment and is not limited to other OWF projects.

14. The long list of other developments (presented in **Appendix 5.1 Cumulative Effects Assessment Methodology**) was then subject to additional screening criteria to establish a short list of other developments for each topic. It should be noted that the approach to the CEA attempts to incorporate an appropriate level of pragmatism. Only projects which are well described and sufficiently advanced, with sufficient detail available with which to undertake a meaningful and robust assessment, have been screened into the CEA.

15. In accordance with PINS Advice Note 17, each development considered alongside the CWP Project as part of the CEA has been assigned to a tier, reflecting their current status in the planning and development process.

16. The purpose of the tiered approach is to give consideration to the level of certainty that a cumulative project will be built and therefore contribute to cumulative effects. For example, there can be greater certainty that other development approved and under construction are likely to contribute to cumulative effects, whereas other development at early phases of development (i.e. pre-planning) are less likely to proceed to construction and contribute to cumulative effects. Furthermore, sufficient detail about these projects is unlikely to be available with which to undertake a detailed cumulative assessment.

17. The proposed tiering structure is presented in **Table 1** and described in more detail in **Appendix 5.1 Cumulative Effects Assessment Methodology**. The tiers are listed in descending order of level of detail likely to be available (and, correspondingly, certainty of effects arising).

Table 1 Tiered structure for other development considered for CEA (modified from PINS Advice Note 17 (PINS, 2019))

Tier	Description
Tier 1	• Under construction; • Permitted applications, but not yet implemented; • Offshore applications submitted six months or more in advance of the CWP Project planning application, but not yet determined; and • Onshore applications submitted six months or more in advance of the CWP Project planning application, but not yet determined.
Tier 2a	• Offshore projects in receipt of a Maritime Area Consent (MAC) and an Offshore Renewable Electricity Support Scheme (ORESS) contract.
Tier 2b	• Offshore projects in receipt of a Maritime Area Consent (MAC); • Offshore Projects in the public domain where an EIA scoping report has been issued; and • Onshore Projects in the public domain where an EIA scoping report has been issued.
Tier 3	• Projects in the public domain where an EIA scoping report has not been issued; and • Projects that have been identified in the relevant development plans and programmes, which set the framework for future development consents / approvals, where such development is reasonably likely to come forward.

3 CEA impact screening

18. The first step in the CEA for noise and vibration is the identification of which residual impacts assessed for the CWP Project alone have the potential to give rise to a cumulative impact with other development (described as 'impact screening'). This screening exercise is set out in **Table 2**.

19. All noise impacts assessed in **Chapter 24 Noise and Vibration** are included in the CEA.

20. In summary, **Table 2** shows that there is the potential for cumulative effects on the noise environment as a result of onshore construction noise impacts (Impact 1 to Impact 6), operational OWF WTG noise (Impact 14a/14b) and the onshore substation operational plant (Impact 15).

21. Other potential impacts, including onshore construction vibration (Impact 7 to 11), construction road traffic noise (Impact 12) and OWF WTG monopiling construction noise (Impact 13) were screened out of the CEA.

Table 2 Tiered structure for other development considered for CEA (modified from PINS Advice Note 17 (PINS, 2019))

Impact	Potential for cumulative effect	Rationale
Construction		
Impact 1: Temporary noise level at NSLs associated with the landfall cable duct installation	Yes	The residual noise effect from the CWP Project OTI and OfTI (intertidal works) construction phase is not significant in

Impact	Potential for cumulative effect	Rationale
Impact 2: Temporary noise level at NSLs associated with the landfall	Yes	EIAR terms as the construction noise threshold is not exceeded. If construction activities at nearby CEA sites are taking place concurrently with the construction of the CWP Project, there is potential for cumulative noise impacts to occur. However, due to the nature of construction works associated with the CWP Project, noise levels from this site will dominate the noise environment when occurring in proximity to the NSLs along its immediate site boundary and construction compounds A-D. The noise contribution from other construction sites would need to be equal to those associated with the proposed development in order to result in any cumulative effect i.e. to increase the predicted noise levels by at least 3 dB. While a 3 dB increase is a doubling of sound energy, subjectively any change in noise level below 3 dB would be barely perceptible. The addition of 3 dB to the highest noise levels predicted at the closest NSLs will be considered in the cumulative scenario.
Impact 3: Temporary noise level at NSLs associated with the intertidal works	Yes	
Impact 4: Temporary noise level at NSLs associated with the onshore export cable works	Yes	
Impact 5: Temporary noise level at NSLs associated with the onshore substation works	Yes	
Impact 6: Temporary noise level at NSLs associated with the ESBN network cable works	Yes	
Impact 7: Temporary vibration effects at VSRs associated with landfall works	No	The residual vibration effect from the CWP Project OTI and OfTI (intertidal works) construction phase is not significant in EIAR terms, due to the vibration transmission predicted to be multiple orders of magnitude below recommended guideline criteria. The residual cumulative impact of the proposed development in combination with other CEA can therefore be considered to be neutral to negative, not significant to significant and temporary due to the distances between the sites and the VSRs. Therefore predicted to be not significant in EIA terms as the construction activities undertaken will be required to operate below the recommended vibration criteria set out in **Table 24.7** in **Chapter 24 Noise and Vibration.**
Impact 8: Temporary vibration effects at VSRs associated with intertidal works	No	
Impact 9: Temporary vibration effects at VSRs associated with onshore export cable works	No	
Impact 10: Temporary vibration effects at VSRs associated with the onshore substation works	No	
Impact 11: Temporary vibration effects at VSRs associated with the ESBN network cable works	No	
Impact 12: Temporary road traffic noise level increases at NSLs due to construction traffic	No	Given the existing ambient noise levels in the study area and the insignificant levels of noise increase as a result of the traffic associated with the CWP Project, it is not

Impact	Potential for cumulative effect	Rationale
		expected that cumulative traffic noise will increase by any significant margin as a result of CEA projects.
Impact 13: Temporary noise level increases at onshore NSLs associated with the WTG monopiling construction	No	Due to the close proximity of the other Phase 1 Project OWF array sites to the north and south of the CWP Project array site (Dublin Array and Arklow Bank Wind Park 2, respectively), there is a potential for cumulative noise impacts to occur at the closest common onshore NSLs. However, as the CWP Project Construction Noise Level (CNL) is more than 10 dB below the lowest night-time CNT (e.g. the predicted WTG monopiling CNL is 32 dB (A) as per **Section 24.9.2** in **Chapter 24 Noise and Vibration.)**, even if piling works were to occur simultaneously at multiple sites there would be no cumulative contribution from the CWP Project monopile installation works at the at the closest common onshore NSLs (e.g. the logarithmic addition of 32 dB (A) and 45 dB (A) gives a cumulative WTG monopiling CNL of 45 dB (A)). The implementation of construction noise thresholds at NSLs will ensure that each development will control noise impacts using best practice guidance documents and appropriate noise limits.
Operation		
Impact 14a/ Impact 14b: Permanent noise level at onshore NSLs associated with the OWF turbines	Yes	Due to the close proximity of the other Phase 1 OWF array sites to the north and south of the CWP Project array site, there is a potential for cumulative noise impacts to occur at the closest common onshore NSLs.
Impact 15: Permanent noise level at NSLs associated with the onshore substation operational plant	Yes	During the OTI O&M phase any cumulative impacts will be due to plant noise operating from the granted sites in the night time period. Although there is an imperceptible impact at the residential receivers, a contribution of 30 dB or more from any of the granted sites could increase the cumulative operational nighttime noise levels above the existing background noise level. However due to the propagation of sound over distance and the large distances

Impact	Potential for cumulative effect	Rationale
		between the closest residential receivers and the majority of the granted sites in the area (greater than 750m) there will be no audible contribution from the sites. A screening process is necessary to identify other projects within 250m of the proposed OTI development site boundary have been identified as having potential cumulative noise impacts to the surrounding NSLs and hence will be considered in the cumulative scenario. As the excess of rating level over background sound level (dB) is closest at NSL25 in the night-time period (-17 dB), this receiver has been selected for cumulative assessment as any increase in the cumulative rated noise level has the potential to exceed the background noise level and thus alter the significance of effect, using the criteria outlined in **Table 24-13** in **Chapter 24 Noise and Vibration.**
Decommissioning		
Impact 16: Temporary decommissioning noise from impact 1 to impact 6 in **Chapter 24 Noise and Vibration**	No	It is understood that the noise from the decommissioning scenarios do not exceed that of the construction phase. It is assumed that no night-time or piling operations would be associated with the decommissioning works. Noise effects are likely to be similar to construction, but shorter in duration.
Impact 17: Temporary decommissioning vibration from impact 7 to 11 in **Chapter 24 Noise and Vibration**	No	
Impact 18: Temporary road traffic noise level increases at NSLs due to decommissioning traffic	No	

4 CEA 'other development' screening

22. The second step in the CEA for noise and vibration is the identification of the other development that may result in cumulative effects for inclusion in the CEA (described as 'project screening'). This information is set out in **Table 3**, together with a consideration of the relevant details of each development, including the tier, proximity to the CWP Project development area and a rationale for including or excluding from the assessment.

23. The other development included in the table below are taken from the long list of other development (presented in **Appendix 5.1 Cumulative Effects Assessment Methodology**). Information gathering for the other development screened in at Stage 2 of the CEA, along with a greater understanding of the potential effects of the CWP Project, has enabled further refinement of the short list.

24. In summary, the following other development will be assessed for potential cumulative effects with the CWP Project in relation to noise and vibration.

- Pembroke Beach DAC / Becbay Ltd & Fabrizia Developments Ltd – Redevelopment of former glass bottle site (CEA- 0333, CEA-0339, CEA-0387, CEA-3003 and CEA-1354)
- EirGrid plc, Poolbeg Generating Station / Substation, CEA-1346;
- Electricity Supply Board (ESB) / EirGrid - Poolbeg Generating Station / Battery Energy Storage System (BESS), Flexible Thermal Generation, Open Cycle Gas Turbine (OCGT) (Developer: ESB) (CEA-1336, CEA-1337, & CEA-1338) and Substation (Developer: EirGrid) (CEA-1346);
- ESB - Dublin Bay Power Station / OCGT, BESS and Flexible Thermal Generation (CEA-1327, CEA-1341 & CEA-1342);
- E D & F Man Liquid Products Ireland Ltd, New Storage tank, (CEA-1344);
- Codema - Dublin's Energy Agency, Dublin District Heating System Project (DDHS), (CEA-1347);
- Hammond Lane Metal Company Ltd., Construction of 2-storey building and non-ferrous metals recovery facility, (CEA-1340);
- Dublin Port Company, Bridge over existing cooling water channel (superseded by CWP project proposals), (CEA-1339);
- Dublin Port Company, Alexandra Basin Re-development, (CEA-0203);
- Google Ireland (Limited), Site of 1.089 ha known as The former Boland's Mill, (CEA-1360);
- Dublin Port Company, 3FM Project, (CEA-1348); and
- Ecocem Ireland Limited, Construction of plant, (CEA-3002)

25. With regard to the CWP OWF WTG the following other OWF WTG developments will be assessed for potential cumulative effects with the CWP Project in relation to operational noise.

- RWE Renewables, Dublin Array OWF, CEA-0037; and
- Sure Partners Limited / SSE Renewables, Arklow Bank OWF Phase 2, CEA-0004.

Table 3 Summary of other development screened into the CEA for noise and vibration

Development	Distance from the array site (km)	Distance from the export cable corridor (km)	Distance from onshore development area (km)	Tier	Included in the CEA (Yes/No)	Rationale
Pembroke Beach DAC / Becbay Ltd & Fabrizia Developments Ltd. Redevelopment of former glass bottle site CEA- 0333, CEA-0339, CEA-0387 and CEA-1354 Planning Ref: 3406/22, 4121/21, 3270/19 and 3207/21	30 - 32.7	0	0	1	Yes	Potential for long-term plant noise, within 250m of NSL25

ESB / EirGrid - Poolbeg Generating Station / Battery Energy Storage System (BESS), Flexible Thermal Generation, Open Cycle Gas Turbine (OCGT) (Developer: ESB) (CEA-1336, CEA-1337, & CEA-1338) and Substation (Developer: EirGrid) (CEA-1346) Planning Ref: 3625/20, 3624/20, 3137/23 and 4057/23.	30 - 31	0.22 - 0.36	0	1	No	No potential for long term plant as more than 1km distance from NSL25.
E D & F Man Liquid Products Ireland Limited New Storage Tank CEA-1344 Planning Ref: 2804/19	30	0.25	0.05	1	No	New storage tank - no sources of operational plant noise
Codema – Dublin's Energy Agency Dublin District Heating System	31.5	0	0	3	No	May operate under an IED licence. No potential for long term plant as more than 600m distance from NSL25.

Project (DDHS) CEA-1347 Planning Ref.: N/A						
ESB Dublin Bay Power Station / OCGT, BESS and Flexible Thermal Generation CEA-1327, CEA-1341 & CEA-1342 Planning Ref: 3074/23, 3646/20 and 3647/20	30	0	0.05	1	No	Will operate under an IED licence. Potential for long No potential for long term plant as more than 600m distance from NSL25.
	31	0.45	0.1	1	No	Noise condition requires that *"The noise levels from the site, during the operational phase, measured as an L_{Aeq} (5min at night, 15 min in day) when all proposed plant is operating, shall not exceed the L_{A90} by 5dB(A) or more.* No potential for long term plant as more than 600m distance from NSL25.
	31	0.45	0.3	1	No	Noise condition requires that *"The noise levels from the site, during the operational phase, measured as an L_{Aeq} (5min at night, 15 min in day) when all proposed plant is operating, shall not exceed the L_{A90} by 5dB(A) or more.* No potential for long term plant as more than 600m distance from NSL25.

Hammond Lane Metal Company Ltd. Construction of 2-storey building and non-ferrous metals recovery facility CEA-1340 Planning Ref: 2130/18	31	0.56	0	1	No	No potential for long term plant as more than 1km distance from NSL25.
Dublin Port Company Bridge over existing cooling water channel (superseded by CWP project proposals) CEA-1339 Planning Ref: 3711/18	31	0.3	0	1	No	No potential for long term plant as more than 1km distance from NSL25.
Dublin Port Company - Alexandra Basin Re-development (CEA-0203) Planning Ref.: FS006980	34	0	0	1	No	No potential for long term plant as more than 1km distance from NSL25.
Google Ireland (Limited) - Site of 1.089 ha known as	34.2	1.7	1.8	1	No	No potential for long term plant as more than 1km distance from NSL25.

The former Boland's Mill (CEA-1360) Planning Ref.: DSDZ4048/23						
Dublin Port Company 3FM Project CEA-1348 Planning Ref.: N/A	32.6	0	0	1	No	No potential for long term plant as more than 600m distance from NSL25.
Ecocem Ireland Limited Construction of plant CEA-3002 Planning Ref.: 3041/24	32	0.5	0	1	No	No potential for long term plant as more than 1km distance from NSL25.
Pembroke Beach DAC – 6 storey structure (CEA-3003) Planning Ref.: PWSDZ3062/24	32.7	0	0	1	Yes	Potential for long-term plant noise, within 250m of NSL25
RWE Renewables - Dublin Array OWF (CEA-0037) Planning Ref.: FS007188 / 2022-MAC-003 and 004	2.8	2	2	2a	Yes	Potential for long-term OWF turbine noise at common onshore NSLs

Sure Partners Limited / SSE Renewables - Arklow Bank OWF Phase 2 (CEA-0004) Planning Ref.: 2022-MAC-002	9.8	9.9	56	2a	Yes	Potential for long-term OWF turbine noise at common onshore NSLs

5 Assessment of cumulative effects

5.1 Onshore construction (impact 1 to impact 6)

26. Based on the residual impact identified in **Chapter 24 Noise and Vibration**, the effect of onshore construction will be negative, not significant to moderate and temporary. The significance of the residual effect is therefore predicted to be not significant in EIA terms.

27. Overleaf summarises the change to the highest predicted construction noise levels (CNL) at the nearest NSLs during any of the construction phases when 3 dB is added to the CNL previously outlined in **Table 24.34** in **Chapter 24 Noise and Vibration.**

28. With the doubling of construction noise levels by 3 dB, all NSLs still remain below the daytime CNT.

29. The residual cumulative construction noise impact significance of effects is changed at three NSLs, namely:

    a. NSL19 (Clanna Gael Fontenoy GAA Club) where the predicted cumulative CNL is 1 dB above the existing baseline noise level but below the CNT. There is a change from not significant to a slight effect at this receptor.
    b. NSL05 (Poolbeg Flexgen) where the predicted cumulative CNL is 6 dB above the existing baseline noise level but below the CNT. There is a change from slight to a moderate effect at this receptor.
    c. NSL03 (City Analysts) where the predicted cumulative CNL is 7 dB above the existing baseline noise level but below the CNT. There is a change from slight to a moderate effect at this receptor.

30. The implementation of construction noise thresholds at NSLs and recommended good practices have been outlined in **Section 24.10** in **Chapter 24 Noise and Vibration**, as well as the compliance of the CEA developments with their respective planning conditions, will ensure that each development will control noise impacts using best practice guidance documents and appropriate noise limits.

31. The residual cumulative effect of the proposed development in combination with other CEA can therefore be considered to be negative, not significant to moderate and temporary. Therefore the effect is predicted to be not significant in EIA terms as the construction activities undertaken will be required to operate below the recommended CNT set out in **Table 24.34** in **Chapter 24 Noise and Vibration.**

Table 4 Comparison of Highest Cumulative RS Predicted CNL with Noise Threshold Limits and Predicted Cumulative Significance of Effect

Receptor			CNT (BS 5228-1 ABC Category or Fixed Limit)	CNL, dB $L_{Aeq,T}$	EPA EIAR Significance of Effects
ID	Description	Ambient Daytime Noise Level (L_{Aeq})	Weekday Day (07:00-19:00)		Weekday Day (07:00-19:00)
Impact 1, Scenario 1: Temporary noise level at NSLs associated with the landfall cable duct installation (Open cut and cofferdam piling)					
NSL09	ED&F Man Liquid	66	75 (Fixed noise limit)	59	Not Significant
NSL10	Marine Terminals Limited	60	75 (Fixed noise limit)	50	Not Significant
NSL14	Poolbeg Quay Apartments	60	65 (A)	50	Not Significant
NSL15	Representative of Dwellings on Leukos Road	60	65 (A)	51	Not Significant
NSL16	Representative of Dwellings on Cymric Road	60	65 (A)	52	Not Significant
NSL17	Representative of Dwellings on Bremen Road	60	65 (A)	50	Not Significant
NSL18	Representative of Dwellings in Bremen Grove	60	65 (A)	49	Not Significant
NSL19	Clanna Gael Fontenoy GAA Club	49	65 (A)	50 Note 1	Slight
NSL20	Star of the Sea National School	58	65 (A)	51	Not Significant
NSL21	Representative of Dwellings on R802 Beach Road Between R131 and Leahy's Terrace Junction	58	65 (A)	50	Not Significant

Receptor			CNT (BS 5228-1 ABC Category or Fixed Limit)	CNL, dB $L_{Aeq,T}$	EPA EIAR Significance of Effects
ID	Description	Ambient Daytime Noise Level (L_{Aeq})	Weekday Day (07:00-19:00)		Weekday Day (07:00-19:00)
NSL22	Representative of Dwellings on R802 Beach Road Between Leahy's Terrace and Beach Drive Junction	58	65 (A)	53	Not Significant
NSL23	Representative of Dwellings on R802 Beach Road Between Beach Drive and Sandymount Court Junction	58	65 (A)	55	Not Significant
NSL24	Representative of Dwellings on R802 Beach Road Between Sandymount Court and Marine Drive Junction	58	65 (A)	57	Not Significant
NSL25	Representative of Dwellings on R802 Beach Road Between Marine Drive and Seafort Avenue Junction	58	65 (A)	58	Not Significant
NSL26	Sandymount Park Educate Together School	58	65 (A)	56 Note 1	Not Significant
NSL27	Church	58	65 (A)	58	Not Significant
NSL28	Representative of Dwellings on R131 Strand Road	58	65 (A)	58	Not Significant

Receptor			CNT (BS 5228-1 ABC Category or Fixed Limit)	CNL, dB $L_{Aeq,T}$	EPA EIAR Significance of Effects
ID	Description	Ambient Daytime Noise Level (L_{Aeq})	Weekday Day (07:00-19:00)		Weekday Day (07:00-19:00)
NSL29	Representative of Proposed Dwellings on Former Irish Glass Site	66	70 (B)	52 Note 1	Not Significant
Impact 3, Scenario 3: Temporary noise level at NSLs associated with the intertidal works (Tensioner Piling)					
NSL05	Poolbeg Flexgen	53	75 (Fixed noise limit)	59	Moderate
Impact 4, Scenario 4.1: Temporary noise level at NSLs associated with the onshore export cable works (Tunnelling at Temporary Tunnel Compound 1 (Launch Shaft in Compound A)					
NSL06	Covanta Plant	44	75 (Fixed noise limit)	67	Moderate
NSL11	1st Port of Dublin Ringsend Sea Scouts	60	65 (A)	49	Not Significant
NSL12	71-80 Pigeon House Road	60	65 (A)	49	Not Significant
NSL13	70 Pigeon House Road	60	65 (A)	47	Not Significant
Impact 4, Scenario 4.2: Temporary noise level at NSLs associated with the onshore export cable works (Tunnelling at Temporary Tunnel Compound 2 (Shellybanks Road Reception Shaft)					
NSL07	Hammond Lane Metal	58	75 (Fixed noise limit)	58	Not Significant
NSL08	Car Mechanics	58	75 (Fixed noise limit)	70	Moderate

Receptor			CNT (BS 5228-1 ABC Category or Fixed Limit)	CNL, dB $L_{Aeq,T}$	EPA EIAR Significance of Effects
ID	Description	Ambient Daytime Noise Level (L_{Aeq})	Weekday Day (07:00-19:00)		Weekday Day (07:00-19:00)
Impact 4, Scenario 4.3: Temporary noise level at NSLs associated with the onshore export cable works (Tunnelling at Temporary Tunnel Compound 3 (Onshore Substation Launch Shaft)					
NSL02	Celtic Anglian Water	58	75 (Fixed noise limit)	67	Moderate
NSL03	City Analysts	58	75 (Fixed noise limit)	65	Moderate
Impact 5, Scenario 5: Temporary noise level at NSLs associated with the onshore substation works					
NSL01	Hammond Lane Metal Recycling	58	75 (Fixed noise limit).	73	Moderate
Impact 6, Scenario 6: Temporary noise level at NSLs associated with the ESBN network cable works (HDD)					
NSL04	Poolbeg AGI	53	75 (Fixed noise limit).	63	Moderate

Note 1: CNL reduced to 52 dB from 62 dB presented in **Table 24.34** in Noise and Vibration Chapter, due to 2.4m site hoarding mitigation for Impact 1 e.g. a 10 dB reduction as no direct line of sight between noise source and receiver post mitigation.

5.2 OWF WTG operation and maintenance (impact 14a/14b)

32. In **Section 24.9.3 of Chapter 24 Noise and Vibration** the CWP WTG (Option A / Option B) predicted noise levels, at the closest NSL to the array site, below the 35 dB L_{A90} criterion and therefore outside the study area for background noise surveys:

    a. In Option A at rated power the predicted WTG operational phase noise level at the closest onshore NSL is predicted as 27 dB L_{A90} at WTG NSL01 (Easting 733,317, Northing 690,867 ITM Ref.).
    b. In Option B at rated power the predicted WTG operational phase noise level at the closest onshore NSL is predicted as 31 dB L_{A90} at WTG NSL01 (Easting 733,317, Northing 690,867 ITM Ref.).

33. Thus, there was no further consideration of operational noise from the CWP WTGs in **Chapter 24 Noise and Vibration**.

34. However, the inclusion of other OWF (CEA-0037 and CEA-0004) has the potential to increase predicted noise levels to above 35 dB L_{A90} at common NSLs to the other OWFs.

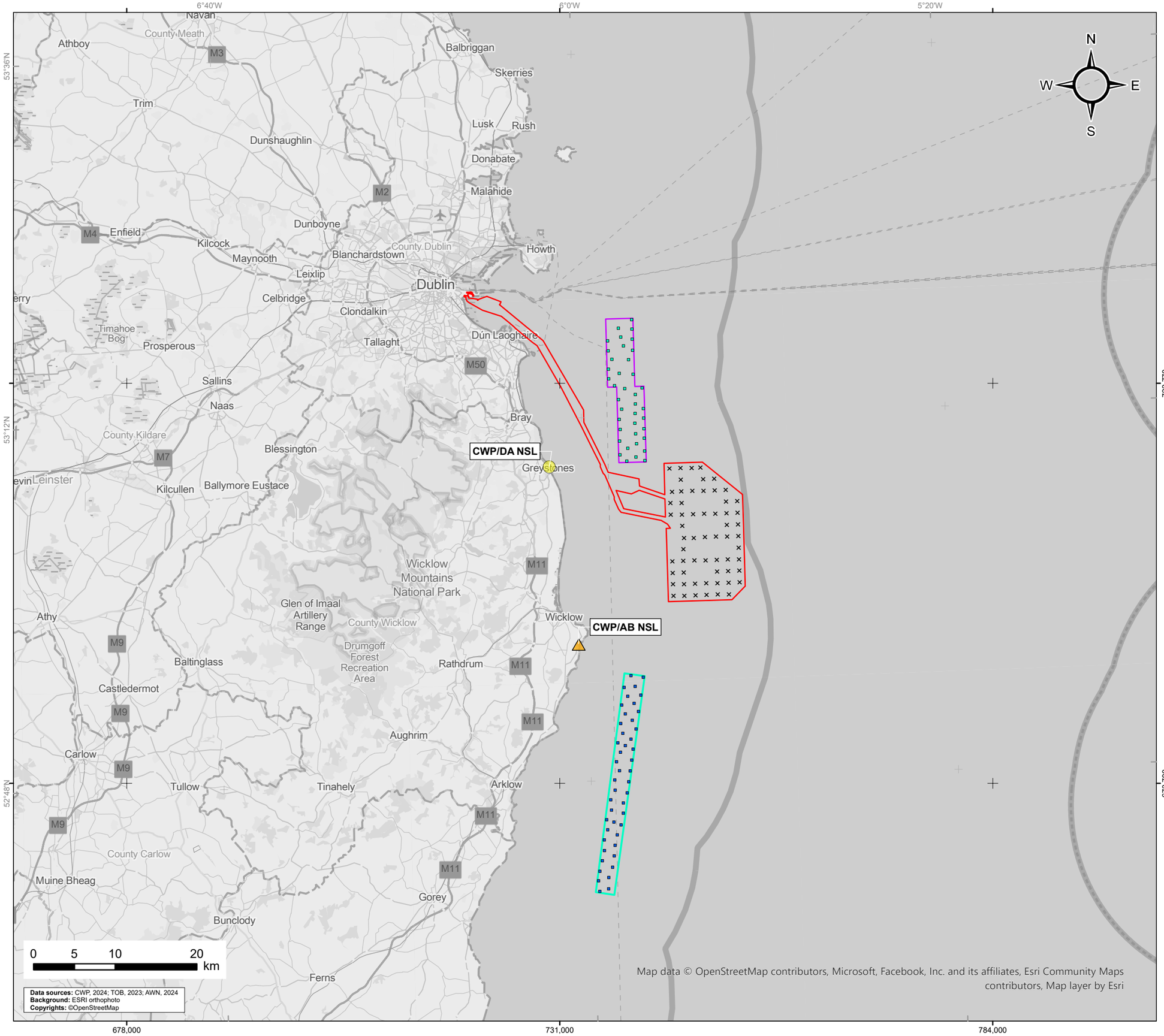
35. Based on CWP WTG Option B operational phase noise level of 31 dB L_{A90} theoretically any predicted noise level above 32 dB L_{A90}, due to any other OWF in its own right, could cumulatively result in a noise level above 35 dB L_{A90} when considered in conjunction with the proposed CWP Project.

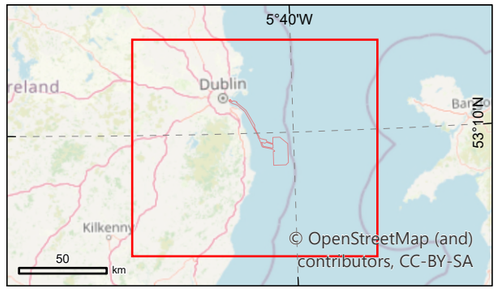
36. Further consideration of the cumulative effect from both windfarms is outlined in the following sections below.

5.2.1 Cumulative Assessment of CWP WTG with Dublin Array (DA) WTG (CEA-0037)

37. The Dublin Array Project Array Site is located approximately 2.8 km to the northwest of the CWP array area.

38. The closest common receiver to the CWP and DA is CWP/DA WTG NSL01 (Easting 729,717, Northing 712,544 ITM Ref.) as shown in Error! Reference source not found. below.





Legend

- Planning application boundary
- CWP/DA WTG NSL01
- CWP/AB WTG NSL01
- × Wind turbine generator (WTG)

Arklow Array

- Wind turbine generator (WTG)
- Arklow Array site boundary

Dublin Array

- Wind turbine generator (WTG)
- Dublin Array site boundary

codling wind park

Project: Codling Wind Park

Contractor: TOBIN

Website: www.tobin.ie

Appendix 24.1 Figure 1

CWP doc. number: CWP-TOB-ENG-08-01-MAP-1656

Internal descriptive code: ALL - PAB..WTG.LO.60.L214 - CLOSEST.NOISE.SL.TO. CWP.DA.WFs..ARK2.WF.WTGs..DA.WF.WTGs - (EIAR.Vol.04.Ch.24.Ap.01.FIG.01)

Size: A3

Scale: 1:450,000

CRS: EPSG 2157

Rev.	Updates	Date	By	Chk'd	App'd
00	Final for issue	2024/08/15	SP	DM/EA	ES

39. As per the Danish methodology outlined in **Chapter 24 Noise and Vibration** and assuming downwind conditions at rated power for both OWF, the predicted cumulative WTG operational phase noise level at the common onshore NSL is predicted as 34 dB L_{A90} at CWP/DA WTG NSL01. Full modelling inputs and assumptions are presented in Appendix 24.3 Operational phase Offshore Wind Farm (OWF) turbine noise.

40. As the predicted noise levels in either option remain below the 35 dB L_{A90} threshold, there is no change in the CWP and DA WTGs cumulative assessment in comparison to the effects presented in **Chapter 24 Noise and Vibration.**

41. The predicted cumulative operational WTG noise levels are conservative as they do not take account of screening due to buildings close to the NSL i.e. no barrier corrections applied to reduce the noise levels further at the NSLs.

42. The wind turbine eventually selected for installation on site will not give rise to noise levels of greater significance than that used for the purposes of this cumulative assessment, to ensure the findings of this assessment remain valid.

43. No specific CWP WTG mitigation measures are required.

5.2.2 Cumulative Assessment of CWP WTG with Arklow Bank (AB) WTG (CEA-0004)

44. The Arklow Bank OWF Phase 2 Array Site is located approximately 9.8 km to the southwest of the CWP array area.

45. The closest common receiver to the CWP and AB is CWP/AB WTG NSL01 (Easting 733,317, Northing 690,867 ITM Ref.) as shown in Error! Reference source not found. above.

46. As per the Danish methodology outlined in **Chapter 24 Noise and Vibration** and assuming downwind conditions at rated power, the predicted CWP WTG operational noise level at CWP/AB WTG NSL01 is 31 dB $L_{A90.}$

47. Based on model outputs provided by the AB project at rated power, the predicted AB OWF WTG operational noise level at CWP/AB WTG NSL01 is 30 dB L_{A90}.

48. As per the Danish methodology outlined in **Chapter 24 Noise and Vibration** and assuming downwind conditions at rated power for both OWF, the predicted cumulative OWF WTG operational phase noise level at the common onshore NSL is predicted as 34 dB L_{A90} at CWP/AB WTG NSL01.

49. As the predicted noise levels in either option remain below the 35 dB L_{A90} threshold, there is no change in the CWP and AB WTGs cumulative assessment in comparison to the effects presented in **Chapter 24 Noise and Vibration.**

50. This cumulative assessment is conservative as it assumes all receptors are downwind of all turbines at the same time, all of which are operating omni-directional and they do not take account of screening due to buildings close to the NSL.

51. No specific CWP WTG mitigation measures are required.

52. If alternative turbine technologies are considered for the site an updated noise assessment will be prepared to confirm that the noise emissions associated with the selected turbines will comply with the noise criteria curves and/or the relevant operational criteria associated with the grant of planning for the Proposed Development. If necessary, suitable curtailment strategies will be designed and implemented for alternative technologies to ensure compliance with the relevant noise criteria curves, should detailed assessment conclude that this is necessary.

53. In the unlikely event that an issue with low frequency noise is associated with the Proposed Project, an appropriate detailed investigation be undertaken. Due consideration will be given to guidance on conducting such an investigation which is outlined in Appendix VI of the EPA document entitled *Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities* (NG4) (EPA, 2016). This guidance is based on the threshold values outlined in the Acoustics Research Centre Salford University document *Procedure for the assessment of low frequency noise complaints, Revision 1, December 2011*.

54. In the unlikely event that a complaint is received which indicates potential amplitude modulation (AM) associated with turbine operation, the operator will employ an independent acoustic consultant to assess the level of AM in accordance with the methods outlined in the Institute of Acoustics (IoA) Noise working Group (Wind Turbine Noise) Amplitude Modulation Working Group (AMWG) namely, *A Method for Rating Amplitude Modulation in Wind Turbine Noise* (August 2016) or subsequent revisions.

55. The measurement method outlined in the IoA AMWG document, known as the *'Reference Method',* will provide an indicator of AM and yield important information on the frequency and duration of occurrence, which will be used to evaluate different operational conditions including curtailment mitigation.

5.3 Onshore operation and maintenance (impact 15)

56. In **Chapter 24 Noise and Vibration** the rating levels have been calculated and then compared to the representative daytime and night-time representative background sound levels for the residential NSLs and assessed in accordance with BS4142:2014+A1:2019. The results of this assessment are shown in **Table 24.42**, where the predicted rating levels and background sound levels have been rounded to the nearest decibel.

57. Based on the residual impact identified in **Chapter 24 Noise and Vibration**, the effect will be neutral, imperceptible and long-term. The significance of the residual effect is therefore predicted to be not significant in EIA terms.

58. The closest predicted rating levels and background noise levels from the O&M activities was at NSL25, where the rating level was 23 dB $L_{AR,T}$ and the background sound level at night-time was 40 dB L_{A90} (as shown in **Chapter 24 Noise and Vibration Table 24.42**).

59. The planning conditions of the other developments outline a requirement for an IED licence or note the following for noise mitigation:

    "The noise levels from the site, during the operational phase, measured as an L_{Aeq} (5min at night, 15 min in day) when all proposed plant is operating, shall not exceed the L_{A90} by 5dB(A) or more."

    Therefore the assumed noise level for each of the other developments is 45 dB $L_{AR,T}$ at 50m from their site boundaries.

60. Given the propagation of sound over distance at that each of the developments is at least 250m from NSL25, it has been calculated that each of the other developments will have a noise contribution at NSL25 that does not exceed 30 dB $L_{AR,T}$.

61. **Table 5** below summarises the predicted cumulative noise levels at NSL25. The predicted cumulative rated noise level is below 40 dB at the closest façade during the night-time period.

Table 5 Predicted rated cumulative noise levels at NSL25

Development Site (Ref)	Predicted rated noise level at closest receiver (dB)
Pembroke Beach DAC / Becbay Ltd & Fabrizia Developments Ltd. Redevelopment of former glass bottle site (CEA-0333)	30
Pembroke Beach DAC / Becbay Ltd & Fabrizia Developments Ltd. Redevelopment of former glass bottle site (CEA-0339)	30
Pembroke Beach DAC / Becbay Ltd & Fabrizia Developments Ltd. Redevelopment of former glass bottle site (CEA-0387)	30
Pembroke Beach DAC / Becbay Ltd & Fabrizia Developments Ltd. Redevelopment of former glass bottle site (CEA-1354)	30
Pembroke Beach DAC – 6 storey structure (CEA-3003)	30
Proposed Project	23
Cumulative rated noise level at closest receiver (NSL25)	**37**

62. As there is no change in the predicted noise level at the closest receiver the cumulative assessment is unchanged in comparison to the effects presented in **Chapter 24 Noise and Vibration.**

6 CEA summary

63. This CEA, which supports **Chapter 24 Noise and Vibration** has assessed the potential cumulative effects on noise and vibration from the construction and operation and maintenance phases of the CWP Project alongside other development.

64. In summary, the CEA for noise and vibration does not identify any significant cumulative effects resulting from the CWP Project alongside other development.

7 References

1. BS 4142 (2014+A1 2019) Methods for rating and assessing industrial and commercial sound (hereafter referred to as BS 4142)**;**
2. Environmental Protection Agency (EPA), Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4) (hereafter referred to as EPA NG4) (EPA, 2016);
3. Institute of Acoustics (IoA) Noise working Group (Wind Turbine Noise) Amplitude Modulation Working Group (AMWG) A Method for Rating Amplitude Modulation in Wind Turbine Noise (IOA, 2016).
4. Acoustics Research Centre Salford University, Procedure for the assessment of low frequency noise complaints, Revision 1, December 2011 (Salford, 2011).