

codling wind park

FIR

Further Information Request (FIR) Response Document


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ABBREVIATIONS

Abbreviation	Term in full
AA	Appropriate Assessment
ADD	Acoustic Deterrent Device
AEP	Annual Exceedance Probability
AESI	Adverse Effects on Site Integrity
BAI	Bat Activity Index
BDMPS	Biologically Defined Minimum Population Scale
BTO	British Trust for Ornithology
CDWMP	Construction Demolition and Waste Management Plan
CEA	Cumulative Effects Assessment
CEMP	Construction Environmental Management Plan
CIEEM	Chartered Institute of Ecology and Environmental Management
CPA	Coastal Planning Authorities
CPUE	Catch per unit effort
CRM	Collision Risk Modelling
CWP	Codling Wind Park
CWP Project	Codling Wind Park Project
DAA	Dublin Airport Authority
DAS	Digital Aerial Survey
DAU	Development Applications Unit
DCCAE	Department of Communications Climate Action and Environment
DDV	Drop Down Video
DLRCC	Dun Laoghaire-Rathdown County Council
DRM	Dispute Resolution Mechanism
EAF	East Atlantic Flyway
EDR	Effective Deterrent Range
EEZ	European Economic Zone
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EPA	Environment Protection Agency
ESAS	European Seabirds at Sea
ESBN	ESB Networks

EU	European Union
EVMP	Ecological Vessel Management Plan
FHD	Flight Height Distribution
FIR	Further Information Request
FMMS	Fisheries Management and Mitigation Strategy
GHG	Green House Gas
GIS	Geographic Information System
GPS	Global Positioning System
HAT	High Astronomical Tide
HDD	Horizontal Directional Drilling
HPAI	Highly Pathogenic Avian Influenza
HPAV	Highly Pathogenic Avian Influenza
HRA	Habitats Regulations Assessment
HWM	High Water Mark
IACs	Inter-array cables
ICES	International Council for the Exploration of the Sea
IPPEMP	In Principle Project Environmental Monitoring Plan
IRCG	Irish Coast Guard
IUCN	International Union for Conservation of Nature
j-EVA	Joint Extreme Value Analysis
JNCC	Joint Nature Conservation Committee
km	Kilometre
LAT	Low Astronomical Tide
LoD	Limits of Deviation
LSE	Likely Significant Effect
LVIA	Landscape and Visual Impact Assessment
m	Metres
MAC	Maritime Area Consent
MAMP	Marine Archaeology Management Plan
MBES	Multibeam Echosounder
mCRM	Migratory Collision Risk Modelling
MGN	Marine Guidance Notes
MI	Marine Institute
MLWS	Mean Low Water Springs

MMMP	Marine Mammal Mitigation Programme
MMO	Marine Mammal Observer
MSFD	Marine Strategy Framework Directive
MW	Megawatt
NE	Natural England
nm	Nautical miles
NMS	National Monument Service
NIS	Natura Impact Statement
NMPF	National Marine Planning Framework
NOAA	National Oceanic and Atmospheric Administration
NPWS	National Parks and Wildlife Service
NRW	Natural Resource Wales
NSIP	Nationally Significant Infrastructure Project
NSL	Noise Sensitive Location
NTS	Non-Technical Summary
O&M	Operations and maintenance
OEC	Offshore export cables
OECC	Offshore Export Cable Corridor
OfTI	Offshore Transmission Infrastructure
OERI	Offshore Renewable Energy Installations
ORD	Offshore Renewable Development
ORE	Offshore Renewable Energy
OREI	Offshore Renewable Energy Infrastructure
ORJIP	Offshore Renewables joint Industry Programme
OS	Ordnance Survey
OSPAR	Oslo and Paris Commissions
OSS	Offshore substation structure
OWF	Offshore wind farm
p.m.	Post meridiem
PAB	Planning application boundary
PAM	Passive Acoustic Monitoring
PCH	Potential Collision Height
PDA	Planning and Development Act
PINs	Planning Inspectorate

PSA	Particle Size Analysis
PTS	Permanent Threshold Shift
PVA	Population Viability Analysis
QI	Qualifying Interest
RED	Renewable Energy Directive
SAC	Special Area of Conservation
SAR	Search and Rescue
SBES	Single-Beam Echo Sounder
SCANS	Small Cetaceans in European Atlantic waters and the North Sea
SCC	Suspended Sediment Concentration
SCI	Special Conservation Interest
SD	Standard Deviation
SLoO	Single Line of Orientation
SLVIA	Seascape, Landscape and Visual Impact Assessment
SNCB	Statutory Nature Conservation Body
SNH	Scottish Natural Heritage (now NatureScot)
SPA	Special Protection Area
SSC	Suspended Sediment Concentration
TTS	Temporary Threshold Shift
UE	Uisce Éireann
UK	United Kingdom
USBL	Ultrasonic Baseline
UXO	Unexploded Ordnance
VER	Valued Ecological Receptors
VHF	Very High Frequency
VP	Vantage Point
WCC	Wicklow County Council
WTG	Wind turbine generator
ZTV	Zone of theoretical visibility
ZVI	Zone of visual influence

1 INTRODUCTION AND DOCUMENT PURPOSE

1.1 Background

1. Codling Wind Park Ltd., a joint venture project between EDF Renewables and Fred. Olsen Seawind, 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. On Friday 6th September 2024 Codling Wind Park Ltd. (referred to hereafter as the 'Applicant') applied for planning permission to An Bord Pleanála (now An Coimisiún Pleanála (and referred to hereafter as the Commission)) under Section 291 of the Planning and Development Act 2000, as amended, for the construction, operation and decommissioning of the CWP Project. The application comprised of:

    1. Planning Documents
    2. Planning Drawings
    3. Planning Report
    4. Planning Report Appendices
    5. Public and Stakeholder Consultation Report
    6. Environmental Impact Assessment Report (EIAR)
    7. Natura Impact Statement (NIS)
    8. Supporting Documents

3. This information was provided in hard and soft copy for the Commission and the relevant coastal planning authorities (CPAs):

    - Dublin City Council;
    - Dún Laoghaire & Rathdown County Council; and
    - Wicklow County Council

4. Soft copies of the planning application were also provided in the form of USB drives to each of the prescribed and transboundary bodies listed in **Appendix A List of prescribed and transboundary bodies** of this **FIR Response Document**.

5. Lodgement of the planning application initiated an eight week consultation period, formally commencing 23rd September 2024 and ending 18th November 2024.

6. During this period the planning application, including the EIAR and the NIS, were made available for inspection by the general public at the offices of the Commission and at each of the above-mentioned CPAs. The planning application was also available to view and download at the CWP Project planning application website: www.codlingwindparkplanningapplication.ie

7. Notices published at the time of the application confirmed the purpose of the consultation period; to provide an opportunity for CPAs, prescribed bodies, transboundary bodies and other third parties (including the general public) to review the planning application documentation and submit formal observations to the Commission relating to –

    i. the implications of the proposed development for proper planning and sustainable development;
    ii. the likely effects on the environment of the proposed development; and
    iii. the likely significant adverse effects on the integrity of a European site, (in the context of the Birds and Habitats Directives).

1.2 Receipt of Further Information Request

8. On 1st August 2025, having reviewed the application documentation, including the EIAR, Appropriate Assessment (AA) Screening Report and the NIS, the Commission issued a Further Information Request (FIR) in relation to the CWP Project.

9. Further to section 292(1)(a) of the Planning and Development Act (PDA) 2000 (as amended), the Commission has requested that a response is provided to the FIR no later than 5.30 p.m. on Monday, 11 May, 2026. In their cover letter, the Commission acknowledged that *'…given the nature and extent of the information sought and in particular the time sensitive nature of any additional survey work that may arise in the marine environment and the time required for any additional survey work, that an extension of time may be required.*' On 7 April 2026 the Applicant requested an extension of time for submitting the FIR response to 30 June 2026. The Commission confirmed acceptance of this request on 8 April 2026.

10. In the FIR correspondence, the Commission also refers to the observations received from CPAs, prescribed bodies, transboundary bodies and other third parties on the content of the planning application.

11. Further to section 292(1)(c) of the PDA 2000 (as amended), the Commission has invited a response to the observations received, to be provided alongside the FIR response.

12. The Applicant has consulted with various stakeholders to inform the FIR Response. A list of stakeholders consulted with, and a summary of the topics discussed is provided in **Appendix B – Schedule if post application consultations** of this **FIR Response Document**.

1.3 Purpose of this document

13. This document, referred to hereafter as the 'FIR Response Document', provides a point by point response to each of the requests made in the Commission's FIR relating to the CWP Project planning application.

14. The Applicant's responses are intended to assist the Commission in its role as the competent authority and decision maker for the CWP Project under Section 291 of the PDA 2000 (as amended).

15. The Commission's decision on whether to grant planning permission for the CWP Project shall be informed by the Inspector's report which shall include the Commission's own Environmental Impact Assessment (EIA) and AA. The Inspector's report shall conclude with a recommendation for whether planning permission should be granted.

16. The purpose of this document is to assist the Commission in preparing its Inspector's report, by ensuring that all pertinent matters raised in the FIR have been responded to.

17. The Inspector's report shall be considered by the Board of the Commission who will make the final decision or 'Direction' on whether to grant planning permission.

18. This document mirrors the structure of the FIR providing a clear record of how the Applicant has responded to each request.

19. It is supported by several other documents that form part of the overall FIR response. This is illustrated by Table 1 below which shows the full set of documents that make up the Applicant's FIR response. Throughout this **FIR Response Document** cross reference is made to information provided in the **Observations Response Document**, the **EIAR Addendum**, the **NIS Addendum**, and other supporting documents.

Table 1 FIR response schedule of documents

Document	Appendices
FIR Response Document This document provides a point by point response to each request made in the Commission's FIR. It cross refers to information provided in the documents listed below.	• Appendix A - List of prescribed and transboundary bodies • Appendix B - Schedule of post application consultations • Appendix C - Data validation statements • Appendix D - Letter from IRCG r.e. Safety Justification • Appendix E - Marine Guidance Note 654 Compliance Checklist • Appendix F - Offshore and Intertidal Ornithology Cumulative Migratory Collision Risk Modelling • Appendix G - Utility of Radar • Appendix H - Suitability of DAS for Characterising Manx Shearwater Activity • Appendix I - Alternative Outputs Referencing NatureScot Higher Displacement and Mortality Rates • Appendix J - Site-specific Flight Height Distribution Data for Collision Risk Modelling • Appendix K - Project-Only PVA Requirement Review • Appendix L - Potential Appendix for alternative outputs for TTS • Appendix M - NMS approval of draft Marine Archaeology Management Plan (MAMP) • Appendix N - Letter from AirNav Ireland r.e. Dublin Airport • Appendix O - SLVIA additional maps • Appendix P - Temporary bailey bridge drawings
Observations Response Document This document provides a point by point response to observations received on the Applicant's planning application.	• Appendix A – Schedule of Transboundary Consultations
EIAR Addendum This document provides new or revised information to support and / or update the planning application EIAR and Non Technical Summary (NTS). **Part 1** - Non-Technical Summary and Chapters 1 to 13 of the EIAR. **Part 2** - Chapters 14 to 34 of the EIAR.	• Appendix 4-A Updated preliminary offshore export cable crossing schedule • Appendix 6-A Modelling Report Addendum • Appendix 6-B Intertidal Assessment • Appendix 7-A Water Framework Directive Assessment Addendum • Appendix 8-A Benthic Subtidal Survey Report 2025 • Appendix 8-B Landfall and Intertidal Survey Report 2025 • Appendix 8-C DDV Wicklow Reef Survey Report 2025

Document	Appendices
	• Appendix 9-A CWP Migratory Fish eDNA Survey Report 2025 • Appendix 9-B Noise overlap with spawning and nursery ground calculations • Appendix 9-C Underwater Noise Modelling Assessment • Appendix 10-A Tern and Black Guillemot Survey Report 2025 • Appendix 10-B Migration Survey Report • Appendix 10-C ESAS Survey Report 2025 • Appendix 10-D Baseline and contemporary data comparison • Appendix 10-E Intertidal Crepuscular Tern Survey Report 2025 • Appendix 10-F Intertidal Waterbirds Survey Report 2025 • Appendix 10-G Regional Population Assessment • Appendix 10-H Kittiwake Displacement Matrices • Appendix 10-I Design-based Density, Abundance Estimates and Distributional Response of the Red-throated Diver • Appendix 10-J Parameterisation of Red-throated Diver Displacement Rates • Appendix 10-K Roseate Tern Collision Risk Modelling • Appendix 10-L Great Black-backed Gull Population Viability Analysis Parameter Log • Appendix 11-A Update to Marine Mammal Baseline Characterisation • Appendix 11-B SMRU Consulting TTS Position Statement • Appendix 11-C Assessment of disturbance from mitigated pile driving – Full results • Appendix 12-A Evidence of fishing within OWF array areas • Appendix 13-A Offshore Bat Survey Report 2025 • Appendix 13-B LUX Assessment Report • Appendix 16-A IRCG Safety Justification • Appendix 16-B Navigational Risk Assessment Addendum • Appendix 21-A Badger and Otter Survey Report 2025 • Appendix 21-B Bat Assessment 2025

Document	Appendices
NIS Addendum This document provides new or revised information to support and/ or update the planning application NIS. It is split into three parts; **Part 1** – Introduction, Screening and SAC/ SPA Project Alone Assessment. **Part 2** – SAC In-combination Assessment **Part 3** – SPA In-combination Assessment	• Appendix A - SPAs Site Specific Conservation Objectives • Appendix B - SACs Site Specific Conservation Objectives
Cumulative Effects Assessment (CEA) Report This document provides updated cumulative assessments for each of the EIA topics. It is split into three parts; **Part 1** – Introduction and Methodology **Part 2** – Offshore Topics (Chapters 6 to 18 of the EIAR) **Part 3** – Onshore and Project-wide Topics (Chapters 19 to 32 of the EIAR)	**Part 1:** • Appendix 1 - Long list of other development **Part 2:** • Appendix 1 - Ornithology Quantitative Tables
Other Documents • Fisheries Management and Mitigation Strategy (FMMS) • Marine Mammal Mitigation Protocol (MMMP) • Ecological Vessel Management Plan (EVMP) • In Principle Project Environmental Monitoring Plan (IPPEMP) • Construction Environmental Management Plan (CEMP) • Construction & Demolition Waste Management Plan (CDWMP) • Marine Archaeology Management Plan (MAMP) • Planning Report Addendum • Regulation 54 Derogation Application	• **Planning Report Addendum:** Appendix 1 - NMPF Compliance / MSFD Assessment • There are no FIR appendices associated with the other stand-alone documents

Document	Appendices
Planning Drawings Planning drawings updated in response to the FIR.	• 0063 Export cable Burial and Protection details Revision B

1.4 Document Structure

20. In line with the purpose set out above, the structure of this document is as follows:

- **Section 1: Introduction and document purpose**
- **Section 2: Applicant's response to the further information request**
- **Section 3: References**

21. To assist the Commission in preparing its Inspector's report, the Applicant has provided an individual response for each of the further information items.

22. The text from each further information item is detailed herein, followed by a corresponding response.

23. Where applicable within the responses, cross references are provided to other relevant FIR response documents (see **Table 1**) and relevant documents in the CWP Project planning application.

2 APPLICANTS' RESPONSE TO THE COMMISSION'S FURTHER INFORMATION REQUEST

2.1 Item 1 General Matters

2.1.1 Item 1a

'In providing its response to the matters raised in this request for Further Information, the applicant is requested to clearly annotate any proposed amendments to the EIAR, NIS and other documentation submitted and cross reference clearly revised/new information across the submitted documentation as appropriate. It is requested that all changes are clearly identified.'

Response

24. Within this document the Applicant has provided a response to each request made in the Commission's FIR. This document mirrors the structure of the FIR providing a clear record of how the Applicant has responded to each request.

25. Throughout this document cross reference is made to information provided in the documents that make up the Applicant's FIR response (see **Table 1**).

26. The **EIAR Addendum** is provided to clearly annotate any proposed amendments to the EIAR. It is a new, standalone document that mirrors the structure of the EIAR as submitted with the CWP Project planning application. Explanatory notes throughout the sections of the addendum highlight where new and / or revised information has been provided for consideration by the Commission in conjunction with the information provided within the planning application EIAR. The explanatory notes within the **EIAR Addendum** make clear what is new information versus information that replaces, or updates text within the planning application EIAR. The explanatory notes also refer back to this document to confirm how the new and / or revised information relates to the requests made within the Commission's FIR.

27. The **NIS Addendum** serves the same purpose as the **EIAR Addendum** but is provided to clearly annotate any proposed amendments to the planning application NIS. The **NIS Addendum** summarises clearly which sections of the NIS have been updated and signposts to where in the **NIS Addendum** the updates have been made. Explanatory notes throughout the sections of the addendum highlight where new and / or revised information has been provided for consideration by the Commission in conjunction with the information provided within the planning application NIS.

28. Throughout this document cross reference is also made to information provided in other, supporting documents and drawings that make up the overall response to the FIR (**Table 1**). Introductory sections within each of these documents make their purpose in respect to the FIR clear and confirm their relationship with the planning application documents. For example, in response to the FIR an updated version of the **Construction Environmental Management Plan (CEMP)** has been submitted. It is provided as a full and complete document which supersedes the **CEMP** submitted as part of the CWP Project planning application. Explanatory notes within the updated **CEMP** make it clear what updates have been made, and why.

2.1.2 Item 1b

'The scientific information provided as part of the planning application documentation should be based on up-to-date survey reports and data. Accordingly, the applicant is requested to confirm/provide justification/verification that the information submitted in support of the planning application remains relevant and appropriate at the point of submitting further information or to update same as required.'

Response

29. The Applicant confirms that the scientific information provided as part of the planning application and their response to the Commission's FIR is based on up-to-date survey reports and data. The information submitted in support of the planning application therefore remains relevant and appropriate at the point of submitting further information. Validation statements for each EIAR topic are provided in **Appendix C – Data validation statements** of this **FIR Response Document.**

2.1.3 Item 1c

'The applicant is requested to confirm whether any on-going or additional surveying has been carried out since the application was lodged and, if so, the applicant is invited to submit any further survey data results and analysis and update the planning application documentation, as appropriate.'

Response

30. The FIR received from the Commission includes several requests for the collection of additional survey data to support the conclusions of the planning application EIAR, NIS and other relevant planning application documents. The Applicant maintains that the baseline characterisation data submitted as part of the planning application remains relevant and appropriate for drawing robust conclusions regarding the projects likely significant effects and is therefore sufficient for enabling the Commission to make a sound planning decision at the date of determination.

31. However, notwithstanding the above, the Applicant has endeavoured to meet the expectations of the Commission by collecting additional survey data across several EIA / NIS topics which validate the existing baseline characterisation.

32. **Table 2** below lists the surveys that have been completed since the CWP Project planning application was lodged in September 2024. Cross reference is made within the table to the appendices that support the **EIAR Addendum**, within which data results and analysis are provided.

Table 2 Summary of surveys completed since the CWP Project planning application

Survey	Status	Results and analysis
Ornithology		
Land based vantage point surveys for migratory birds	Apr 2025 (Spring) and Oct 2025 (Autum)	Appendix 10-B Migration Survey Report
Digital aerial surveys (4km buffer around array site and entire area of The Murrough SPA)	Nov 2024 to Apr 2025	Appendix 10-D Baseline and contemporary data comparison

Survey	Status	Results and analysis
Digital aerial surveys (10km buffer around array site and entire area of The Murrough SPA)	May 2025 – Feb 2026	
Boat based visual surveys for migratory birds	Apr to May 2025 (Spring), and Sep to Oct 2025 (Autum)	Appendix 10-B Migration Survey Report
European Seabirds at Sea (ESAS) and Kittiwake flight height	June - July 2025	Appendix 10-C ESAS Survey Report 2025
Boat based acoustic surveys for migratory birds	Apr to May 2025 (Spring), and Sep to Oct 2025 (Autum)	Appendix 10-B Migration Survey Report
Landfall surveys for intertidal birds (and seals)	Jan 2025 to Feb 2026	Appendix 10-E Intertidal Crepuscular Tern Survey Report and Appendix 10-F Intertidal Diurnal Waterbirds Survey Report
Tern and Black Guillemot surveys at onshore substation	Jun 2025 to Jul 2025	Appendix 10-A Tern and Black Guillemot Survey Report 2025
Marine Mammals		
Digital aerial surveys (4km buffer around array site and entire area of The Murrough SPA)	Nov 2024 to Apr 2025	Appendix 11-A Update to Marine Mammal Baseline Characterisation
Digital aerial surveys (10km buffer around array site)	May 2025 – Nov 2025	
Boat based visual surveys for marine mammals (supplementary records)	Apr to May 2025 and Sep to Oct 2025	
Landfall surveys for seals (supplementary records)	Jan 2025 to Jan 2026	
Offshore Bats		
Boat based acoustic surveys for migratory bats from within the array site	May 2025 to Jun 2025 and Oct 2025 to Nov 2025	Appendix 13-A Offshore Bat Survey Report 2025
Headland acoustic bat surveys	Apr to Jun 2025 and Nov to Dec 2025	
Subtidal and intertidal ecology		
Benthic survey of Wicklow Reef SAC	Aug 2025	Appendix 8-C DDV Wicklow Reef Survey Report 2025
Subtidal benthic ecology survey	Aug 2025	Appendix 8-A Benthic Subtidal Survey Report 2025
Intertidal benthic ecology survey	Aug 2025	Appendix 8-B Landfall and Intertidal Survey Report 2025

Survey	Status	Results and analysis
Fish and shellfish ecology		
Migratory fish (eDNA) surveys	Jun 2025 and Oct 2025	Appendix 9-A CWP Migratory Fish eDNA Survey Report 2025
Shipping and navigation		
Summer and Winter radar surveys	August 2025 and Jan 2026	Appendix 16-B Navigational Risk Assessment Addendum
Onshore biodiversity		
Badger survey	17 July 2025 and 5 Dec 2025	Appendix 21-A Badger and otter Survey Report 2025
Otter survey	17 July 2025	Appendix 21-A Badger and otter Survey Report 2025
Onshore bats	Aug to Sep 2025	Appendix 21-B Bast Assessment 2025

2.1.4 Item 1d

'*An Coimisiún Pleanála (herein referred to as the Commission), acknowledges the provision of the 'In Principle Environmental Monitoring Plan' (IPEMP), as part of the submitted application documentation, however, the range of monitoring proposals and language used within that document do not provide sufficient clarity, commitment nor detail of monitoring measures and reporting which the Commission considers to be required for a project of the scale and duration proposed, throughout the construction, operational and decommissioning phases of the proposed development. Drawing on the detail of the further information here sought and submissions made by the prescribed bodies and third parties on this application, the applicant is requested to provide a more comprehensive operational IPEMP for the proposed development. In this regard, the applicant is advised that the revised IPEMP should fully inform the requirements of any future decommissioning plan(s), check the successful and timely implementation of mitigation measures, detect any unexpected impacts requiring additional measures, and justify any adaptive mitigation measures required. The proposed operational monitoring should be provided at appropriate intervals, for appropriate periods, and provide for adequate reporting to the relevant compliance authorities*.'

Response

33. In response to the above request the Applicant has provided an updated **In Principle Environmental Monitoring Plan** (**IPPEMP**) with the FIR response. This version of the **IPPEMP** (Rev 01) supersedes the previous revision (Rev 00) that was included with the CWP Project planning application.

2.1.5 Item 1e

'In relation to the MAC boundary, the applicant is requested to confirm the following, having regard to the provisions of sections 286(3) and (4) of the Planning and Development Act 2000 (as amended) (2000 Act):

i. The temporary construction activities (including, inter alia, turbine installation) required to undertake the proposed development in the maritime area are to be undertaken within the spatial representation (map) of the MAC consent area,

ii. That all permanent development (including blade sweep) can be accommodated within the spatial representation (map) of the MAC consent area,

iii. how the design flexibility approved by the Commission with respect to the siting of turbines will interact with the MAC consent area.

Response

34. In response to item 1e of the FIR, the Applicant can confirm the following:

i. The temporary construction activities (including, inter alia, wind turbine generator (WTG) installation) required to undertake the proposed development in the maritime area are described in EIAR **Volume 2, Chapter 4 Project Description**. These shall be undertaken within the spatial representation of the Maritime Area Consent (MAC) area, as shown on planning drawing **0001 Regional Site Location Map**.

ii. All permanent development (including blade sweep for both WTG layout options (WTG Layout Option A and WTG Layout Option B)) shall be accommodated within the spatial representation of the MAC consent area, as shown on planning drawings **0008 Offshore Site Layout Plan Option A (75 WTGs)** and **0012 Offshore Site Layout Plan Option B (60 WTGs)**.

iii. The preferred location of the WTGs and Offshore Substation Structures (OSSs) for each of the two WTG layout options, including foundation scour protection, is described with a limit of deviation (LoD) around the centre point of each WTG. A LoD in the form of a 100m buffer from the centre point of each WTG and OSS location is proposed, however a reduced LoD is proposed for WTGs on the array site boundary. This will ensure that WTG blades do not overhang the MAC consent area. The reduced LoDs for WTGs on the array site boundary are shown in the planning drawings mentioned above.

2.1.6 Item 1f

The applicant is requested to provide the location of the following proposed infrastructure used in the coastal processes models for each design option applied for:

- *All offshore wind turbines and offshore substations including scour protection,*
- *All cables including scour and cable protection.*

Please see Appendix A attached to this report.

Response

35. Firstly, with regards to operational effects on prevailing hydrodynamic, wave and sediment regime and coastal processes, the Applicant confirms that modelled locations for WTGs, OSSs, offshore cables and scour and cable protection are as described for WTG Layout Option A in EIAR **Volume 2**, **Chapter 4 Project Description** and as shown on following planning drawing **0007 Offshore Site Layout Master Plan - Option A (75 WTGs)**.

36. To assess the effects on the prevailing regimes, WTG Option A was implemented in the model domain as this represents the greatest total seabed area take. WTG Option B would not introduce any new impacts, or lead to effects that would be materially different to Option A in terms of EIA significance.

37. With regards construction effects from the installation of the offshore infrastructure, sediment plume dispersion simulations were performed to quantify the suspended sediment concentrations (SSC's), depositional footprint (thickness of the deposit on the seabed) and transport trajectory of sediment plumes that may be generated as a result of 1) disposal of dredge arisings from bedform clearance activities, and 2) cable trenching activities.

38. With regards cable protection the Applicant can confirm that representative locations, as described in **Volume 4, Appendix 4.1 Cable protection locations** of the EIAR, informed the assessment of impacts to *inter alia* hydrodynamic processes, and habitat loss. The representative locations with associated Limit of Deviation are described in the above document, which has not required an update. In light of the approach taken in assessing representative locations of cable protection, and that the dimensions provided within both EIAR **Chapter 4 Project Description** and on planning drawings **0062 Inter-array and Interconnector cables burial and secondary protection details** and **0063 Export cable burial and protection details,** it is considered that any illustration of cable protection locations would be at risk of misinterpretation. Further to this it is considered that the representative locations are described in **Appendix 4.1** of the EIAR, and as such it is not necessary or appropriate to provide the locations in a geospatial data format that may infer that the locations are fixed, or risk misinterpretation.

39. With regards the scour protection, as noted within **Volume 2, Chapter 4 Project Description** of the EIAR, the arrangement of scour protection around the base of the WTG and OSS foundations are shown in planning drawings **0058 Layout Option A - Wind Turbine Generator (WTG) Details**, **0059 Layout Option B - Wind Turbine Generator (WTG) Details**, **0060 Layout Option A - Offshore Substation Structure (OSS) Details** and **0061 Layout Option B - Offshore Substation Structure (OSS) Details**. The proposed parameters for scour protection are defined in **Table 4-8** of **Chapter 4 Project Description**, which notes height, area, volume and extent. In light of the clearly defined parameters, and that the locations are the same as the WTG and OSS foundations, it is not considered necessary or appropriate to provide the locations in a geospatial data format.

40. For disposal of dredge arisings, four scenarios were simulated using representative disposal locations, again based on WTG Option A. These are described in **Section 5.2.3** of EIAR **Volume 4**, **Appendix 6.3 Modelling Report**. A further five scenarios were simulated for cable trenching activities. The locations of these are also described in in **Section 5.2.3** of EIAR **Volume 4**, **Appendix 6.3 Modelling Report**.

2.1.7 Item 1g

'*The statements in paragraph 461 of Chapter 4 are noted, however, the applicant is requested to provide any further details available in relation to the timing of the provision of the upgraded Poolbeg 220kV substation to which the proposed development will ultimately connect, and whether additional detail can at this stage be provided in relation to the connection points for the project. In the event that this request cannot be fully addressed by the applicant, the applicant is requested to provide explanation and justification for the response provided*.'

Response

41. **Section 4.9.4** of EIAR **Volume 2**, **Chapter 4 Project Description** details that the ESBN network cables will connect from the CWP onshore substation to the upgraded Poolbeg 220kV substation, which is being constructed by EirGrid. As agreed with EirGrid, the ESBN network cables will enter the

upgraded Poolbeg 220kV substation along the western boundary of the substation and this is outlined in **Planning drawing 0054 ESBN Network Cables (sections and layout**). The ESBN network cables will remain underground and terminate into the electrical switchgear within the upgraded Poolbeg 220kV substation building.

42. The upgraded Poolbeg 220kV substation is in receipt of planning permission (Planning reference Dublin City Council 4057/23). EirGrid have confirmed that contracts for the construction of the substation have been awarded and works commenced in March 2026. The upgraded substation is scheduled for completion in Q3/Q4 2028.

43. The Applicant notes that the upgraded Poolbeg 220kV substation will be constructed and ready to accept the connection of the ESBN network cables from the CWP Project. The CWP Project has received formal confirmation from EirGrid of this connection into the upgraded Poolbeg 220kV substation. No further assessment is required.

2.2 Item 2 Search and Rescue

2.2.1 Item 2a

'The Irish Coast Guard (IRCG), through the Department of Transport, has raised concerns in relation to the layout of the proposed development with respect to Search and Rescue (SAR) access. The applicant is requested to consult with the IRCG, in addressing these concerns, and provide further information and clarification on such matters.'

Response

44. The Applicant has provided responses to the IRCG's comments in **Section 5.6** of the **Observations Response Document.** Two in person meetings have been held with IRCG to discuss the points raised in the observations and FIR on 9 October 2025 and 26 November 2025. SAR lanes of a minimum of 500 m are maintained in one line of orientation (East / West) through the CWP Project array. SAR lanes are maintained in a second line of orientation (North / South) apart from in one lane where an OSS is located. The layout is therefore strictly a Single Line of Orientation (SLoO) layout, noting the majority of the layout accommodates multiple lines of orientation. In line with the Department of Transport (DoT) Guidance on Safety of Navigation & Emergency Response: Offshore Renewable Energy Installations (DoT, 2025a), IRCG requires SLoO layouts to be supported by a Safety Justification.

45. The Applicant submitted the Safety Justification to the IRCG on 2 December 2025. This is provided in **Appendix 16-A IRCG Safety Justification** of the **EIAR Addendum**. Following review, the IRCG confirmed via a letter on 11 February 2026 that they were content that the relevant requirements had been met, subject to implementation of conditions set out in the letter. The Applicant notes the conditions and have no comments on them. This letter is provided in **Appendix D – Letter from IRCG r.e. Safety Justification** of this **FIR Response Document**.

2.2.2 Item 2b

'In June 2025 the Department of Transport published two documents, "Guidance on Safety of Navigation & Emergency Response: Offshore Renewable Energy Installations", and "Standard Operating Procedure 07-2025 – Offshore Renewable Energy Installations: Guidance and Operational Considerations for SAR and Emergency Response". The Commission notes that the application

documentation submitted has been prepared broadly in line with the standard practice in terms of safety of navigation and emergency response procedures in place prior to the publication of these documents. Notwithstanding this, however, the applicant is requested to submit details which demonstrate the proposed development's compliance with these recently published documents in relation to navigation safety and emergency response. In this regard the applicant is requested to identify, clarify and highlight where the design approach, and layout of the proposed development is already in compliance with the newly published guidance documents, should amendments be required to ensure compliance with these guidance documents the applicant shall provide additional information, discussion, justification and/or updates to the application documentation and design as necessary. '

Response

46. The DoT Guidance on Safety of Navigation & Emergency Response: Offshore Renewable Energy Installations (DoT, 2025a) states the following:

47. *"This guidance document should be taken into account by OREI developers seeking planning consent for offshore wind farm developments, with the exception of ORESS 1 projects that shall rely on MGN 654".*

48. On this basis, the CWP Project must comply with Marine Guidance Note (MGN) 654 (MCA, 2021). The MCA have developed a template document that can be completed by developers to show how the guidance has been complied with. **Appendix E - Marine Guidance Note 654 Compliance Checklist** of this **FIR Response Document** provides the completed template, demonstrating compliance with MGN 654 (MCA, 2021).

49. Notwithstanding this the Applicant notes there is broad similarity between MGN 654 (MCA, 2021) and the DoT Guidance on Safety of Navigation & Emergency Response: Offshore Renewable Energy Installations (DoT, 2025a). This guidance, and The Standard Operating Procedure 07-2025 – Offshore Renewable Energy Installations: Guidance and Operational Considerations for SAR and Emergency Response (DoT, 2025b) have informed the Safety Justification submitted to the IRCG as per response to item 2a.

2.3 Item 3 National Maritime Planning Framework

2.3.1 Item 3 a - d

'The Commission notes the information contained in the Planning Report Appendix A: Compliance with the National Marine Planning Framework submitted with the application, and Section 2.6.1 of the EIAR, which sets out how the project meets the requirements of the NMPF. The Commission also notes the March 2024 EU Commission Notice on the threshold values set under the Marine Strategy Framework Directive 2008/56/EC and EU Commission Decision 2017/848, in particular the four thresholds established for habitat loss (D6C4), adverse effects on habitats (D6C5), impulsive noise (D11C1) and continuous noise (D11C2) listed in the Annex to this EU Commission Notice. The Commission considers the use of these thresholds would assist in achieving consistency in the presentation of the results across the Irish Sea Phase 1 ORE projects, and would facilitate the assessment of the relevant NMPF policies based on EU agreed indicators and thresholds.

The applicant is therefore requested to:

a) 'Model, map and present the areal and temporal extent of the potential impact of the proposed development for the full construction and operation campaign on the following indicators:

iv. *the potential spatial extent of habitat lost (D6C4),*

v. *the potential spatial extent of habitat adversely effected (D6C5),*

vi. *the modelled impulsive noise (D11C1) with and without abatement, and*

vii. *the modelled continuous noise (D11C2).'*

b) Assess the results obtained for potential habitat loss and habitat adversely affected in A above against the 2% thresholds established for habitat loss (D6C4) and the 25% threshold for adverse effects on habitats (D6C5) for the MSFD Celtic Seas North Inner Marine Reporting Unit, as detailed in Ireland's Draft Marine Strategy Part 1 Article 8, 9 and 10 report 2024 including its annexes, published in July 2024.

c) Assess the results obtained from modelled impulsive (with and without abatement) and continuous noise in A above against the relevant thresholds values for impulsive and continuous noise set out in the above referenced EU Commission Notice.

d) Incorporate the output from A, B and C above, and all other relevant updates made as a result of this Further Information request, into a revised assessment of the NMPF policies, particularly Biodiversity Policy 2, Seafloor Integrity Policies 1, 2 and 3, Fisheries Policy 5 and Underwater Noise Policy 1. This revised assessment should fully account for the distinction the NMPF places on 'important' species and habitats as defined on page 35 and 36 of the NMPF.

The spatial extent of the modelled potential habitat loss, habitat adversely effected and impulsive and continuous noise should be provided in GIS format, see Technical NOTE Appendix A.

Response

50. The Applicant has undertaken the modelling as requested in Items 3a-3c above, the detail of which is presented within **Appendix 1 - NMPF Compliance / MSFD Assessment** to the **Planning Report Addendum.** The Applicant has considered the Commission's request and confirmed during consultation with the Commission that in some cases (underwater impulsive noise) the threshold referred to is not available in the EU literature. In response to this the Commission suggested reference should be made to the Marine Strategy for Ireland documentation. The Applicant notes that due to an apparent error in transposition within the Marine Strategy, the threshold referred to for impulsive noise in the Marine Strategy document is incorrect. Notwithstanding this the Applicant has undertaken modelling of the relevant thresholds and includes an output for the incorrect threshold for completeness. The full response to this request is provided in **Appendix 1 - NMPF Compliance / MSFD Assessment** to the **Planning Report Addendum**.

51. With regards Item 3d The Applicant refers the Commission to the **Planning Report Addendum** which confirms that there is no impediment to the policy objectives of the National Marine Planning Framework (NMPF) being achieved. The spatial extent of the modelled potential habitat loss, habitat adversely effected and impulsive and continuous noise is provided to the Commission in GIS format, where appropriate. The list of GIS files provided is available in the cover letter submitted with the FIR response.

2.4 Item 4 Ecosystem Services

In relation to the Ecosystem Services Assessment included within the planning documentation as Annex 1 of Appendix A of the Planning Report:

2.4.1 Item 4a

The applicant has screened out waste services from further consideration on the basis of the project not being located on or near any dumping at sea areas. While this is noted, the Commission request that the applicant confirms whether the potential implications of the crossing of existing waste water pipelines by proposed infrastructure has been considered, clarification, justification and/or further assessment/mitigation should be provided as appropriate.

Response

52. The Ecosystems Services Assessment (**Annex 1 of Appendix A** of the **Planning Report Appendices**) screened each ecosystem service for relevance to the CWP Project, as outlined in Valuing Ireland's Coastal, Marine and Estuarine Ecosystem Services (Norton et al., 2018). In Table 3 of the Ecosystems Services Assessment, waste services were screened out as it was concluded that 'The CWP Project does not impact on the ability of the marine environment to mediate waste and is not located on or near any dumping at sea areas.' This conclusion is in line with the definitions outlined in Norton et al (2018) which estimates the value of the aquatic environment in terms of processing urban wastewater discharges in Ireland.

53. Crossing of existing waste water pipelines by the CWP Project is considered in **Section 4.7.5** of EIAR **Volume 2**, **Chapter 4 Project Description**; **Volume 4**, **Appendix 4.2 Preliminary offshore export cable crossing schedule** (updated by **Appendix 4-A** of the **EIAR Addendum**); and **Volume 3**, **Chapter 18 Material Assets- Marine Infrastructure**.

54. The Applicant notes that the design and methodology for the asset crossings will be confirmed in agreement with the Uisce Éireann (UE). Specifically, a Confirmation of Feasibility letter was received from UE in June 2024 in relation to the crossing of the UE assets. The letter records that subject to a detailed design being agreed, the proposal to cross UE assets can be facilitated. The letter was provided with the planning application as part of the **Planning Documents** (see **Schedule 4**, **Landowner Letters of Consent**).

55. Prior to seabed preparation and cable installation activities commencing, all existing infrastructure will be surveyed and confirmed within 100 m either side of the crossing point. EIAR **Volume 2**, **Chapter 4 Project Description** describes that concrete mattresses will likely be placed over existing infrastructure to form a separation layer. The CWP export cable will then be laid across these concrete mattresses at an angle close to 90 degrees. The CWP export cable will then be covered by secondary mattresses to secure the cables in place and ensure that they remain protected. EIAR **Volume 3**, **Chapter 18 Material Assets- Marine Infrastructure** considered the potential for direct and indirect effects to occur during the construction, operation and maintenance and decommissioning phases of the CWP Project and for this to result in damage to existing infrastructure. The assessment concluded that with the proposed mitigation in place, there would be no significant effects during any phase of the CWP Project.

56. The Applicant notes that no changes to the conclusions or further assessment is required in the Ecosystems Services Assessment relative to the waste water pipeline crossings.

2.4.2 Item 4b

The Commission notes that coastal defence is also scoped out of consideration, however, the proposed development will require works along and within the coastal area which will necessitate the provision of a temporary cofferdam and other elements of construction and drainage management occurring along the coastline and making permanent changes, the applicant is therefore requested to provide further justification/discussion/assessment in this regard on this issue.

Response

57. The Ecosystems Services Assessment (**Annex 1** of **Appendix A** of the **Planning Report**) screened each ecosystem service for relevance to the CWP Project, as outlined in Valuing Ireland's Coastal, Marine and Estuarine Ecosystem Services (Norton et al., 2018).

58. Saltmarsh is the only ecosystem examined in relation to its role in coastal defence. In Table 3 of the Ecosystems Services Assessment, coastal defence services were screened out as there is no interaction with saltmarsh ecosystems.

59. The Ecosystems Services Assessment concluded that '*Any change in capacity of the marine environment within the CWP Project area to provide coastal defence services is scoped out, on the basis that there is no net loss of coastal habitat. In addition, all works at landfall are temporary, and works are limited to intertidal muds, a lower order of coastal defence habitat when compared to saltmarsh*.'

60. This conclusion is in line with the approach in Norton et al.,2018.

61. Works on the coastline are described in **Section 4.8.3** of EIAR **Volume 2**, **Chapter 4 Project Description** and **Planning Drawings 0015** and **0017-0019**. The works include the installation of a temporary cofferdam, temporary access ramp and landfall cable ducts along a section of the coastal revetment and pedestrian footpath. Once works are completed, the coastal revetment including the existing footpath will be fully reinstated.

62. EIAR **Volume 3**, **Chapter 8 Subtidal and Intertidal Ecology** describes that the habitats at this location on the coastal revetment are made up of intertidal mudflat habitats. Seagrass (*Zostera* sp) do not occur at this location on the coastline. Any such seagrass communities are located further south and c. 1.5 km from the landfall activities on the coastline.

63. These works on the coastline have been fully assessed within the EIAR **Volume 3**, **Chapter 8 Subtidal and Intertidal Ecology** and NIS **Volume 4 - Assessment of Implications for Special Areas of Conservation**. Any effects associated with the works were concluded to be temporary, not significant and there will be no net loss of habitat.

64. The Applicant notes that there are no changes to the conclusions or further assessment required in the Ecosystems Services Assessment relative to the proposed coastline works.

2.4.3 Item 4c

It appears that table no. 4 has been repeated within the Ecosystem Services Assessment (once in portrait format and then followed in a landscape format), the applicant is invited to confirm whether this is a formatting/typographical error or whether an additional table or further discussion on the topics has been omitted in error. In this regard the applicant is invited to review and provide an updated assessment report addressing this issue and those raised at (a) and (b) above.

Response

65. It is confirmed that **Table 4** in the **Ecosystem Services Assessment** has been repeated across both portrait and landscape formats. Both tables reflect the same information and this is a formatting error. No text has been omitted and no updates are required to the assessment.

66. **Table 4** as presented in **Annex 1** of **Appendix A Ecosystems Services Report** of the **Planning Report Appendices** remains unchanged.

2.5 Item 5 Cumulative Impacts

2.5.1 Item 5

'The Commission notes that cumulative assessment is addressed under each topic-specific chapter in the EIAR, as well as in an appendix to each topic-specific chapter and Appendix 5.1.

The Marine Institute in their observation raises concerns in relation to the cumulative effects assessment noting that holistic integrated assessments are required at a site, regional and ecosystem level, and that monitoring for realised impacts should be available for incorporation into future cumulative impact assessments. The Commission notes the cumulative assessment details that have been submitted and that the approach adopted has been informed by 2019 UK guidance which was in place at the time of lodgement of the current application. The applicant is advised that the UK guidance has been updated, namely Nationally Significant Infrastructure Projects: Advice on Cumulative Effects Assessment - GOV.UK, September 2024 (NSIP, 2024).

The applicant is requested to revise the submitted cumulative assessment in line with NSIP (2024) and submit a standalone document to clearly demonstrate the CEA conclusions. In the interests of consistency and transparency, the applicant is requested to complete the assessment in accordance with the templates provided in the NSIP (2024), namely "Appendix 1: Matrix 1 – Identification of 'other development' for CEA" and "Appendix 2: Matrix 1 – Assessment matrix" (see attached Appendix B).

This assessment should include each of the Irish Sea Phase 1 ORE Projects, namely (Oriel WF (ABP-319799-24), Arklow WF (ABP-319864-24), North Irish Sea Array (ABP-319866-24), and Dublin Array WF (ABP-321992-25),as well as the Dublin Port 3FM project and all other relevant projects in the International Council for the Exploration of the Sea (ICES) Celtic Sea and Greater North Sea ecoregions, regardless of project type. It is further requested that the applicant confirm that the now published documentation pertaining to the Irish Sea Phase 1 ORE projects, which have all been submitted to the Commission for planning consent since this application was submitted, have been fully incorporated into the cumulative effects assessment.

In accordance with the NSIP (2024) tiered approach, it is requested that the subject proposal and each of the Irish Sea Phase 1 ORE projects and the Dublin Port 3FM project be classified under Tier 1 ("Other existing and, or approved development submitted applications under the Planning Acts or other regimes but not yet determined"). The applicant is requested to update the application documentation, where relevant.

In the interests of comprehensiveness and for ease of reference, the applicant is strongly encouraged to liaise with the other Irish Sea Phase 1 ORE Project applicants and Dublin Port in the preparation of the above assessment and drafting of the tables attached in Appendix B.'

Response

67. In response to item 5 of the FIR the Applicant has completed an update to the cumulative effects assessment (CEA) that formed part of the planning application EIAR.

68. All updates to the CEA have been captured within a new, standalone **CEA Report**. The **CEA Report** brings together the CEAs for each EIA topic into a single document. It supersedes the CEAs that were submitted in **Volume 4** of the EIAR. Taking account of the FIR, the **CEA Report (Part 1)** also provides an update to the CEA methodology and therefore supersedes EIAR **Volume 4**, **Appendix 5.1 Cumulative Effects Assessment Methodology**.

69. As requested, the Applicant has updated the CEA to align with the latest UK guidance on CEA for nationally significant infrastructure projects (NSIPs) (PINS, 2024). As part of this update, the Applicant has revisited Stage 1 and Stage 2 of the CEA.

70. For Stage 1 of the CEA, the Applicant has updated the long list of other existing and, or approved development. This has been undertaken to identify any new, relevant projects or plans that have become present in the public domain since the planning application CEA long list was established. The update has also captured any changes to the planning / tier status of projects that were included within the original long list. The **CEA Report (Part 1)** describes the ecosystem search areas that were used as a basis for updating the long list. The long list is presented in **Appendix 1 Long list of other development** of the **CEA Report (Part 1)**. As requested by the Commission, the long list in **Appendix 1** is presented in line with Matrix 1 of the Planning Inspectorate (PINS) 2024 guidance on CEA.

71. The Applicant can also confirm that the updated CEA includes the assessment of potential cumulative effects with the other Irish Sea Phase 1 OWF Projects and the Dublin Port Company 3FM Project. The **CEA Report** has been prepared using the most recently published documentation for these projects These projects are now classified in the CEA long list as Tier 1 and the assessments across all relevant EIA topics have been updated to reflect this.

72. Finally, the Applicant also confirms that the **CEA Report** incorporates a CEA summary for each EIA topic. This summary is presented in line with Matrix 2 of the PINS 2024 guidance on CEA.

2.6 Item 6 Marine Geology, Sediments and Coastal Processes

2.6.1 Item 6a

'The applicant to provide additional details, clarification or justification explaining the apparent gap in data collection and interpretation of surficial sediments between figures 6.9 and 6.11, of Chapter 6 of the submitted EIAR.'

Response

73. In response to Item 6a of the FIR, the Applicant has provided clarity on the apparent gap in data collection in **Section 6.4** of the **EIAR Addendum (Part 1)**. In summary, the identified data gap corresponds to a 500 m buffer zone surrounding the CWP Project array area, which was introduced only as part of the 2024 Maritime Area Consent (MAC) boundary extension to enable the temporary deployment of demarcation buoys and does not contain any permanent infrastructure or activities with the potential to affect geology, sediments, or coastal processes. Accordingly, it was appropriate that this zone was not included in the original geophysical survey scope. The MAC extension occurred after the completion of the geophysical campaign and therefore lies outside the surveyed footprint; however, a desktop review has been included in the EIAR for completeness. Existing regional surficial

sedimentology datasets were used to confirm that the 500 m MAC extension is consistent with the conditions already characterised within the surveyed area.

74. Given the absence of any expected impact pathways, the temporary, minimal activities taking place, that no permanent infrastructure is proposed within this extended area, and that the supplementary data provide adequate spatial coverage and contextualisation, the data gap is not considered to compromise the robustness or integrity of the overall assessment. The characterisation of the receiving environment is therefore considered adequate and appropriate for the purposes of undertaking EIAR.

2.6.2 Item 6b

'The modelling undertaken in Appendix 6.3 does not demonstrate the schematisation of spatial variation of bed friction or bed shear stress values across the model domain. The applicant is requested to submit additional detail/plots in an updated review of the modelling undertaken.'

Response

75. In response to Item 6b of the FIR, the Applicant has provided additional detail, including spatial plots, on the spatial variation of bed friction values across the model domain in **Appendix 6-A Modelling Report Addendum** of the **EIAR Addendum.** Specifically, bed resistance, expressed as Manning's N coefficient, ranges from values of 25 to 45 across the domain. These values were determined based upon interpretation of bed resistance from the regional seabed surficial sediment characteristics (see **Figure 6-9** of **Volume 3, Chapter 6 Marine Geology, Sediments and Coastal Processes** of the EIAR). Spatial variation of bed resistance was already incorporated into the hydrodynamic modelling process, as these coefficients were applied throughout the model domain to represent seabed roughness and influence flow resistance. This ensures that sediment transport and plume dispersion modelling accounted for realistic bed friction conditions based on site-specific sediment characteristics, and therefore appropriate for the assessment conducted.

2.6.3 Item 6c

'The applicant is requested to confirm whether any on-going or additional surveying has been carried out since the application was lodged and, if so, the applicant is invited to submit any further survey data results and analysis and update the planning application documentation, as appropriate.'

Response

76. The Applicant confirms that additional site-specific surveys have been undertaken since submission of the application. Additional benthic and intertidal site-specific surveys were undertaken in 2025, conducted at 69 stations with contaminant analysis undertaken at 10 stations in the intertidal area and 12 stations across the offshore export cable corridor (OECC). This survey supplements the 2021 surveys undertaken to inform the application which were conducted at 46 stations with chemical contaminant analysis undertaken at eight stations across the OECC Full details are provided in **Appendix 8.3 CWP Benthic Baseline Report** of the EIAR and **Appendix 8-A 2025 Benthic Baseline Report** of the **EIAR Addendum**. The 2025 surveys, along with supplementary datasets, validate the existing characterisation of the receiving environment presented in the original application. The newly acquired data are consistent with the baseline conditions previously reported and therefore accompany this FIR response for completeness. However, these data do not necessitate any revisions to the

impact assessment or numerical modelling, as they do not materially alter the assumptions, inputs, or conclusions of the existing evaluation.

2.6.4 Item 6d

'*The coupled hydrodynamic and wave modelling that has been submitted and incorporated into the submitted EIAR assessments is acknowledged. Notwithstanding this, however, the applicant is requested to undertake a greater range of sensitivity runs to examine the coupled model performance to allow more detailed consideration of potential impacts on physical processes. Model scenarios should include an assessment of extreme events e.g. 10%, 5%, 2%, 1%, 0.5% and 0.2% Annual Exceedance Probability (AEP) event horizons and joint probability occurrences of tidal, surge, and wave conditions, while also providing for climate change*.'

Response

77. The Applicant acknowledges the request for additional sensitivity runs and provide the following summary of the extreme event assessment undertaken. Full detail on the analysis is provided in **Section 5.1** of **Appendix 6-A Modelling Report Addendum** of the **EIAR Addendum**. **Section 6.10.2** (Impact 1: Localised alteration of hydrodynamic and wave conditions across the site and effects on the sediment transport regime and coastal processes) of the **EIAR Addendum (Part 1)** also reflects this updated analysis. The Applicant notes that the interpretation presented in the following text is of data that already informed the modelling and assessment, and as such is not new or additional data, but rather it is used to address the request made.

78. Utilising data obtained from the hindcast modelling and joint Extreme Value Analysis (j-EVA) that has been performed by MetoceanWorks for the Applicant (noting the coupled hydrodynamic and wave model used for the other aspects of the assessment was calibrated against this hindcast, so is deemed suitable for these purposes), two distinct joint-occurrence scenarios, corresponding to the 0.2% and 1% Annual Exceedance Probability (AEP), are simulated (pre and post development) over a 48-hour period to capture the full pre-event, peak-event, and post-event dynamics. The 0.2% and 1% AEP scenarios modelled represent real events that occurred in the Irish Sea and are present within the 30-year hindcast that was modelled as part of the assessment.

79. The results for these extreme scenarios show that within the array footprint only minimal localised changes occur to hydrodynamic and wave conditions, and that for the events modelled there are no discernible far-field impact on currents, waves, or water levels beyond natural variability, c. 800 m from the array site. Given that these scenarios represent some of the most physically extreme metocean conditions experienced at the site in recent history, it is considered reasonable to conclude that lower probability extreme events (e.g., 2%, 5%, 10% AEP; i.e. less extreme) would similarly result in only localised and negligible impacts to hydrodynamic and wave conditions. As such these other scenarios have not been assessed as they would not meaningfully inform or alter the existing assessment or conclusions.

2.6.5 Item 6e

'The applicant is requested to include the impact of wind blocking on coastal processes. It is requested that this be addressed through site specific wake and wind field modelling considering the entire windfarm layout.'

Response

80. The Applicant acknowledges the concern regarding potential wind-blocking effects [1] on coastal processes and the request for site-specific wake and wind-field modelling across the entire windfarm layout. Following review of regulatory guidance and relevant scientific literature, the Applicant considers that such modelling is not proportionate or required for the reasons set out below.

81. Coastal processes in the project area are governed principally by tidal currents, wave climate and seabed morphology, which together exert far greater influence on sediment pathways than WTG-induced variations in near-surface wind flow. Although wind contributes to offshore wave generation, the distance between the proposed windfarm and the shoreline substantially reduces the potential for atmospheric wakes to produce measurable changes in coastal sediment dynamics. Studies on offshore wind wakes demonstrate that wake effects are primarily relevant to WTG power performance and atmospheric boundary-layer flow (Barthelmie & Jensen, 2010; Stevens & Meneveau, 2017).

82. Existing literature and empirical studies further indicate that wake effects diminish offshore and are unlikely to propagate to the coastal zone. Christiansen et al. (2022) found that tidal currents in coastal shelf seas substantially disperse and dampen wind-farm wakes, limiting their spatial extent and influence on nearshore waters. Likewise, Paskyabi (2015) demonstrated that wake-related changes in stratification and upwelling remain confined to the immediate vicinity of offshore arrays. These findings indicate that any residual wake signal at the coastline would be negligible relative to natural variability in waves, tides and sediment transport.

83. Site-specific wake modelling for coastal processes would necessitate detailed coupling of mesoscale atmospheric models with wave and hydrodynamic sediment-transport models. The Applicant considers this would introduce substantial analytical complexity without materially changing the conclusions of the assessment. The primary pathways through which wind affects coastal processes, namely wave generation and storm surge, are already accounted for through long-term wind records, metocean datasets and wave modelling undertaken for the CWP Project, ensuring realistic representation of offshore wind forcing under baseline and extreme conditions.

84. Best practice Regulatory guidance and established consenting practice for offshore wind EIAs at a regional or European scale do not typically require atmospheric-wake analysis within coastal-processes assessments. Natural Resources Wales' GN041 best-practice guidance (2020) sets expectations for numerical assessment of hydrodynamics, waves and morphological (sediment) responses to marine development, without prescribing atmospheric wake analysis. The Natural Resource Wales (NRW) baseline survey guidance (Brooks et al., 2018) likewise identifies hydrodynamics (waves, tidal currents and water levels) and sediment transport as the relevant physical-process parameters to characterise. Where wake effects are referenced in policy, they relate to energy-yield and inter-project planning considerations (DENSZ, 2025), rather than coastal geomorphology. These documents represent the most appropriate guidance in this instance as they provide detailed, process-specific requirements for coastal and marine physical assessments. These aspects are absent from other sources, such as Environment Protection Agency (EPA, 2022), which does not set out equivalent detail for hydrodynamic or sediment-transport modelling in offshore wind contexts, and instead present a higher level, broader framework. Consequently, a broader review of best practice indicates that NRW guidance offers the most comprehensive and relevant framework for assessing coastal-process impacts of marine developments. It is for these reasons that the Phase 1 projects adopted the guidance, which in addition to the important aspects referred to also facilitates a robust, comparable, and compatible approach for the purposes of cumulative effects assessment, where relevant.

[1] Wind blocking refers to the slowing and deflection of wind flow upstream of a WTG or wind farm due to the WTGs acting as an obstruction to the airflow, which could marginally reduce local wind-wave generation.

85. Although atmospheric wakes remain an active scientific research field, current peer-reviewed studies primarily investigate wind-farm aerodynamics, power deficits and atmospheric turbulence, rather than coastal sediment transport or shoreline response. There is no established regulatory methodology or consensus linking WTG-induced atmospheric wakes to measurable coastal-process change. Project-specific wake modelling for this purpose would therefore exceed current industry standards, introduce methodological uncertainty and would not provide decision-useful evidence for environmental management.

86. To strengthen the evidence base, the Applicant has supplemented the literature review with quantitative analysis of the wind, wave and current conditions within the CWP Project area, based on hindcast data for the 40 most extreme storm events. The directional roses presented in **Plate 1** show that easterly conditions are both infrequent and of comparatively minor magnitude. For wind, the rose indicates that the highest occurrence of extreme events is associated with South and southwesterly sectors, while easterly winds represent a negligible proportion of the dataset. Similarly, the wave rose demonstrates that significant wave heights during storm events predominantly originate from the south, with easterly waves similarly accounting for only a negligible proportion of the dataset. Current patterns follow the same trend, with dominant flows tidally aligned north-south. This alignment reflects the semi-enclosed geometry of the Irish Sea basin, which constrains tidal propagation along its longitudinal axis and results in strong bidirectional flows between the northern and southern entrances. This characteristic also influences the wave and wind climates; the longest fetches and most energetic storm tracks align with the Irish Sea's channel configuration, reinforcing the dominance of southerly wave approach and south / southwesterly wind sectors. These findings confirm that conditions from the eastern quadrant are rare and benign relative to dominant forcing directions, reinforcing the conclusion that any potential wake-related influence on coastal processes would be negligible due to the lack of alignment between the coastline and CWP Project infrastructure.

87. In summary, although the theoretical basis for considering wind blocking is acknowledged, the available scientific evidence, governing hydrodynamic conditions and distance from shore indicate that WTG-induced atmospheric wakes would not materially influence coastal processes in this case. The existing assessment, supported by robust metocean data, wave modelling and sediment-transport analysis, is proportionate, evidence-based and aligned with current regulatory guidance. The Applicant therefore considers that additional wake and wind-field modelling would be disproportionate and is not merited for the proposed development.

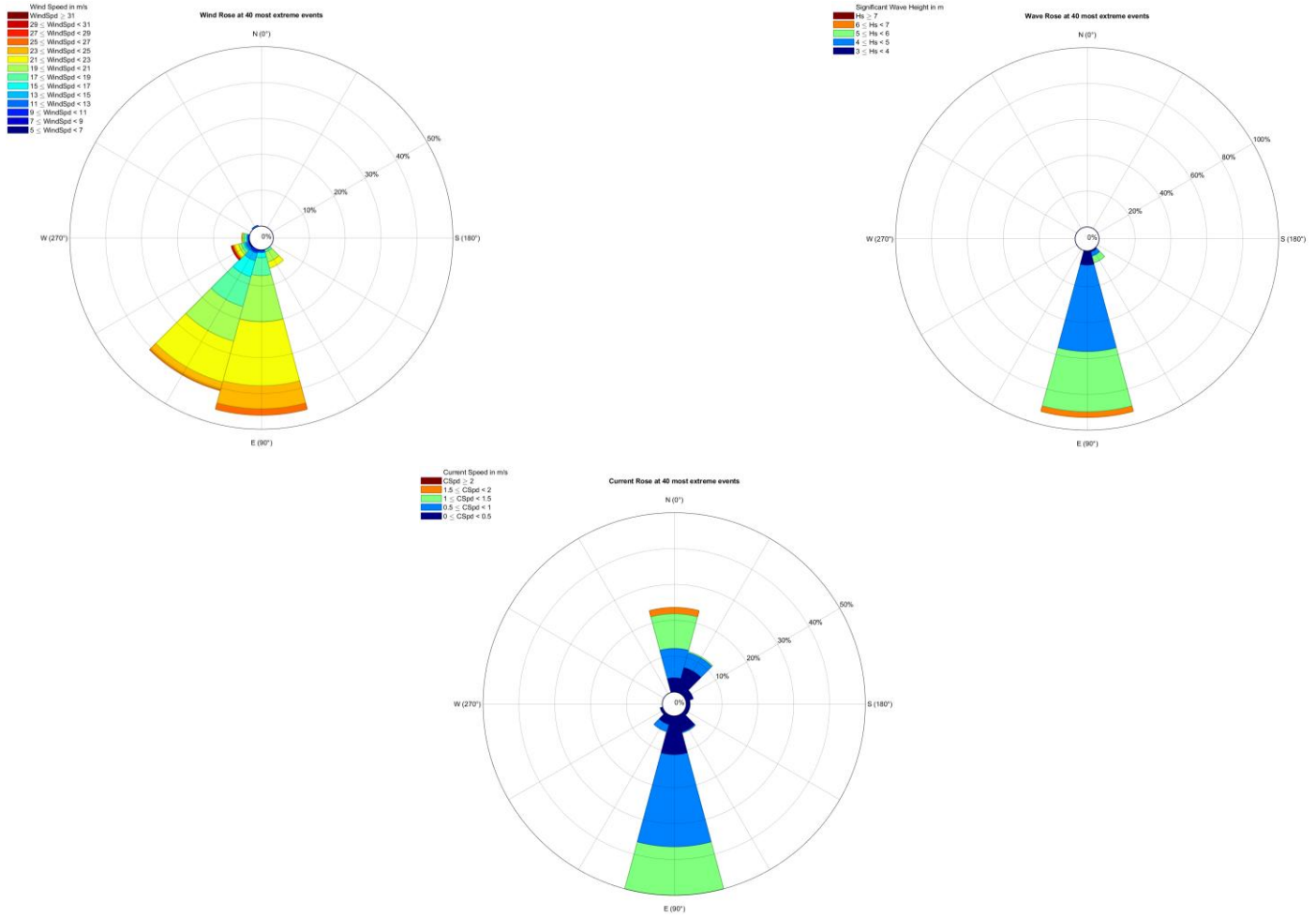


Plate 1 Wind (left), wave (right) and current (bottom) rose plots for the 40 largest storm events present within the 40-year hindcast modelled, centred within the CWP array area.

2.6.6 Item 6f

'The applicant is requested to assess the longer-term impact of the dredge dispersal modelling on the seabed morphology (operational plus decommissioning phases).'

Response

88. In response to Item 6f of the FIR, the Applicant notes the request to assess longer-term morphological effects associated with dredge dispersal during operation and decommissioning. The dispersion modelling undertaken for the construction and installation of the project (see **Appendix 6-A Modelling Report Addendum** of the **EIAR Addendum**) demonstrates that increases in water column suspended sediment concentrations and associated seafloor deposition are short-lived and spatially limited. Modelling shows that suspended sediments that are released rapidly disperse and return to baseline conditions within c. 11 days, with measurable depositional thicknesses on the seabed restricted to areas within, or up to 7 km from the MAC boundary; these sediments are anticipated to be rapidly reworked and integrated into the existing sediment regime.

89. Given the short duration of predicted sediment disturbance, the limited spatial footprint, and the absence of hydrodynamic changes capable of modifying transport regimes, no pathway to long-term or large-scale changes in seabed morphology has been identified for either the construction, operational or decommissioning phases. The Applicant therefore considers that additional longer-term morphological assessment is not required, and the conclusions of the coastal processes assessment remain robust.

2.6.7 Item 6g

i. *'The Commission notes that a detailed assessment of the impact of the construction, operation and decommissioning phases arising from the provision of the offshore export cables through the intertidal zone has not been undertaken in terms of coastal processes. The applicant is therefore requested to provide a comprehensive assessment of the impact of these works on sediment transport, morphology, and intertidal sediment releases (including potential resuspension of contaminated sediment) as well as wave and currents across all phases of the proposed development within the intertidal area.*

ii. *The potential for contaminated sediments to be released during installation of the landing cable and the construction process through the intertidal area has not been assessed. The applicant should provide details of how it is intended to deal with this issue and clarify whether sediment chemical analysis and waste classification analysis along the proposed cable landing route commencing at the landing site through the intertidal area is required, and/or how any contaminated material may be comprehensively dealt with (including any proposed waste licencing requirements arising from the presence of contaminated or hazardous material arising). Furthermore, particle tracking modelling assessing the potential transport of any contaminants should be carried out if contaminated sediments are identified.*

iii. *The Commission notes that the applicant is proposing the use of trench excavation (for a distance approximately 350m offshore from the HWM) throughout the intertidal zone. From the details submitted this construction methodology does not appear to be consistent with best practice (as noted in the DAU submission) in terms of on-shoring of export cabling through this sensitive intertidal area which is designated as both an SAC and SPA. In this regard the Commission notes that the application documentation does not give sufficient (or any) consideration to the use of horizontal directional drilling (HDD) as a construction method through the intertidal area. The applicant is therefore requested to submit comprehensive environmental justification for the*

proposal to use trenching in this instance while also ensuring the protection of sensitive environmental features, species and habitats. Alternatively, in the absence of sufficient environmental justification for the use of intertidal trenching the applicant is requested to update all relevant application documentation to provide for comprehensive assessment of HDD through the intertidal area to facilitate the onshoring of the export cabling and amend any relevant responses to further information queries (such as at G(i) and G(ii) above) accordingly.'

Response

90. 6(g)(i) The Applicant confirms that a comprehensive assessment of the intertidal works and their potential effects on coastal processes have been provided in **Appendix 6-B Intertidal Assessment** and **Section 6.10** of the **EIAR Addendum**. This assessment addresses the potential impact on sediment transport, morphology, and resuspension of sediment due to cable installation activities within the intertidal zone. The findings of this assessment conclude that effects resulting from intertidal sediment release, the associated sediment transport, and any potential alterations to the intertidal morphology, are localised and reversible within the dynamic sandy foreshore and intertidal environment. Suspended sediment concentration (SSC) elevations during construction are predicted to be short-lived and primarily occur during tidal inundation when disturbed sediments are entrained and dispersed. These increases remain within the natural variability observed in Dublin Bay and return to baseline within hours to days post-works, supported by evidence from comparable cable projects (e.g., Newell et al., 1998; WSP, 2024). Operational activities involve buried cables with no ongoing sediment disturbance, and decommissioning would follow the same best-practice controls as construction, yielding similarly transient and localised effects.

91. 6(g)(ii) Sediment sampling and contaminant analysis undertaken (**Appendix 8.3 CWP Benthic Baseline Report** of the EIAR and **Appendix 8-A 2025 Benthic Baseline Report** of the **EIAR Addendum**) confirm no exceedances to Irish upper action levels or Cefas AL2 within the intertidal footprint. It is therefore anticipated that there will not be a need for contamination waste management.

92. 6(g)(iii) EIAR **Volume 2, Chapter 4 Project Description**, **Section 4.8.3** and **Section 4.8.4**, details the cable installation method through the intertidal zone. The landfall cable ducts will be installed from the transition joint bays into the intertidal zone, to approximately 50 m from the high water mark (HWM). Intertidal cable ducts will then be installed from the seaward end of the landfall cable ducts to approximately 350 m from the HWM. Both the landfall and intertidal cable ducts will be installed using open cut trenching.

93. Different temporary structures are required for the different installation techniques, in that Open Cut requires a temporary cofferdam and Trenchless Techniques would require temporary reception pits. CWP has conservatively proceeded on the basis that those are details of the development that would have to be specified in the application for permission, unless the Commission had issued an opinion under Section 287A of the Planning and Development Act 2000 (as amended) (PDA) to confirm that the planning application could granted on the basis of two different options (it is accepted that the legal position is unclear in relation to whether that is required for temporary structures for construction purposes).

94. Accordingly, CWP submitted a request to the Commission under Section 287A (2) of the Planning and Development Act (PDA) 2000 (as amended) which described details of where options were required to accommodate the different construction methodologies. On 1 May 2024 CWP received an opinion from ACP in accordance with Section 287(B)(2) of the PDA (as amended) which states "*the Board decided not to accept the request for design flexibility for … construction options for landfall cable ducts … as the Board considered that these elements of the proposed development relate to normal construction practices that are intrinsic to the installation of the development*.". This is a reasonable reading of the legislative scheme, but one involving a degree of legal risk that the Applicant has decided not to take.

95. Following the receipt of the Section 287B opinion, open cut installation was selected as the preferred installation method. Paragraphs 302 to 305 of **Volume 2, Chapter 3 Site Selection and Consideration of Alternatives** of the EIAR set out the reasons for this. In summary:

- Trenchless techniques require open cut as a backup in the event that the HDD fails in-situ.
- The Commission had refused to grant an opinion under Section 287A confirming that the CWP Project was entitled to apply for permission without specifying the detail of the temporary structures associated with both techniques;
- SI works to confirm the feasibility of launch pits could not be carried out due to infestation of Japanese Knotweed at the launch site location.

96. In addition, drill lengths for Trenchless Techniques (e.g. Horizontal Directional Drilling (HDD)) would typically not exceed 1 km in length due to environmental and technical limitations presented with this installation method. The works in the intertidal zone will be over 4 km in length.

97. The trenchless technique installation method was not considered in EIAR **Volume 2, Chapter 4 Project Description** as the CWP Project is not seeking permission for Trenchless Techniques and in particular is not seeking permission to construct the temporary structures associated with those techniques.

98. EIAR **Volume 2, Chapter 3 Site Selection and Consideration of Alternatives** details how the Applicant considered alternative route designs and installation methods for the offshore and landfall cables**.** The assessment was informed by environmental and technical considerations where the Applicant sought to minimise environmental effects whilst also being assured that any preferred installation method was deliverable. The cable route alignment was optimised to minimise environmental effects on marine archaeology, benthic ecology, fish and shellfish ecology, commercial fisheries and shipping and navigation.

99. The open cut works through the intertidal zone and as described in EIAR **Volume 2, Chapter 4 Project Description** have been fully assessed within the EIAR and NIS. Any effects associated with the works were concluded to be temporary and not significant and therefore acceptable. Likewise, in the context of Appropriate Assessment (AA), the NIS identified no adverse effects on the integrity of European Sites as a result of open cut cable duct installation. The results of the EIA and AA demonstrate that open cut cable duct installation is an environmentally acceptable option, considering the relevant mitigation measures proposed. The Applicant notes that these conclusions have not been challenged by the Development Applications Unit (DAU) and the request for consideration of Trenchless Techniques is on the basis that it is perceived to be “better practice” only.

100. The Applicant notes that there are no changes to the conclusions or further assessment required relative to the cable installation through the intertidal area.

2.6.8 Item 6h

In relation to classification of receptor sensitivity throughout Section 6.10 (Impact Assessment) of the submitted EIAR, the Commission notes that a blanket classification of receptors in the study area as being of low sensitivity has been applied, notwithstanding that works in the intertidal and proximate areas are in locations designated as SAC and SPA. The designation of such receptors as having low sensitivity runs contrary to table 6-4 of the EIAR. The applicant is therefore requested to amend, clarify, and/or justify the impact assessment within section 6.10 as required to address this issue.

Response

101. The Applicant acknowledges the Commission's observation regarding the classification of receptor sensitivity in **Section 6.10** of **Volume 3, Chapter 6 Marine Geology, Sediments and Coastal Processes** of the EIAR. The impact assessment has been reviewed and updated to clarify the basis on which sensitivity has been assigned to receptors within the study area, particularly in relation to designated sites occurring within the intertidal and nearshore environment, where coastal processes form the relevant impact pathway.

102. In accordance with **Table 6-4** of **Volume 3, Chapter 6 Marine Geology, Sediments and Coastal Processes** of the EIAR, sensitivity is now differentiated according to the presence of protected features that have a functional relationship with coastal processes. On this basis, the Mudflats and Sandflats feature of the South Dublin Bay Special Area of Conservation (SAC) have been assigned a High sensitivity rating[2]. All other qualifying interests of this SAC, as well as the features of the South Dublin Bay and River Tolka Estuary SPA, Dalkey Islands SPA and Rockabill to Dalkey Island SAC, have been assigned Low sensitivity, as they are not influenced by coastal processes in the context of the proposed works and therefore do not constitute receptors for this impact pathway.

103. Hydrodynamic and sediment dispersion modelling further demonstrates that the predicted areas of temporary elevation in suspended sediment concentrations, including peak values that may exceed natural variation, do not overlap with any designated site boundaries. As a result, even for the Mudflats and Sandflats feature, there is no exposure to changes in sediment dynamics and no mechanism through which effects on habitat structure, extent or function could occur. Accordingly, the significance of effect on designated sites has been confirmed as Minor, remaining the same as the original application.

104. **Section 6.10** of the **EIAR Addendum (Part 1)** reflect these updates to the EIAR, to aid in understanding the sensitivity ratings applied, and to incorporate the modelling evidence demonstrating the absence of interaction between predicted effects and designated site features.

2.6.9 Item 6i

In relation to all sediment disturbance modelled, the applicant is requested to provide the following:

i. Statistical maximum for sediment deposition depths (cm) and suspended sediment concentration (mg/l) across the model domain for the entire construction campaign (including piling, cabling, dredge deposition etc.) presented in the form of heatmaps. This should include heatmaps of predicted percentage change relative to the baseline across the relevant key temporal periods. The applicant must confirm that the modelling used reflects the baseline conditions in terms of the modelled particle size used, i.e., the modelling should be aligned to known baseline conditions. These heatmaps should be used to inform any further ecosystem and cumulative assessments such as smothering or impaired foraging within the relevant sections of an updated EIAR.

ii. Similar to i) above, the sediment deposition depths and suspended sediment concentration across the model domain for the entire operational campaign should be presented as heat maps of the percentage change relative to baseline and used to inform relevant EIAR ecosystem and cumulative assessments.

[2] This rating differs from the previously assigned sensitivity of Low; despite this change the conclusions remain no greater than the original application.

iii. Results should be illustrated on appropriately scaled drawings/maps and be provided in GIS format (see Appendix A, Technical Details).

Response

105. The Applicant has updated the reporting of the sediment transport simulations to further clarify the construction phase works proposed. This includes activities associated with the installation of export, inter-array, and interconnector cables; foundation drilling for WTGs and OSS; and dredge material disposal following seabed clearance works. The updated modelling outputs incorporate the statistical maximum values for sediment deposition thicknesses and suspended sediment concentrations across the entire model domain for the duration of the construction campaign. These outputs are presented in the form of heatmaps and timeseries in **Section 6.1** to **Section 6.4** of **Appendix 6-A Modelling Report Addendum** of the **EIAR Addendum**. The modelling approach has been verified against known baseline particle size distributions to ensure consistency with existing conditions. All figures have been illustrated on appropriately scaled maps and have been supplied in Geographic Information System (GIS) format in accordance with Appendix A (Technical Details) in **Appendix 6-A** of the **EIAR Addendum**.

2.6.10 Item 6j

'The longer term morphodynamic impact of the development including cable landing, scour protections and WTG foundations is not assessed. This requires coupled wind wave hydrodynamic and sediment transport modelling. The applicant is requested to submit modelling of the morphodynamic response of the coastline to the proposed development. Morphodynamic modelling is to be extended over a series of longer time horizons which must account for the proposed operational phase plus decommissioning and compared with the non-developed scenario for same time period.'

Response

106. The Applicant acknowledges the concern regarding potential longer-term morphodynamic impacts of the development. Coupled wind wave and hydrodynamic modelling, that has been performed to assess the potential impacts of the fully installed (operational) Offshore Wind Farm (OWF) infrastructure, demonstrates that predicted effects to wave and hydrodynamic conditions are localised, primarily to areas around the individual WTG and OSS monopile foundations and associated seabed scour protection, and that the effect dissipates with distance (see **Section 6.5** of **Appendix 6-A Modelling Report Addendum** of the **EIAR Addendum**). The scientific consensus supports this observation that wave energy attenuation and current modification resulting from offshore windfarm installation are negligible, at distances greater than 1 km, compared to natural variability. Peer-reviewed studies (Rivier et al., 2016; Hosseini et al., 2025; Bailey et al., 2024) confirm that hydrodynamic and sediment transport alterations do not generally propagate beyond the immediate wind farm footprint.

107. As effects to wave and hydrodynamic conditions are predicted to be localised to the array site, the Applicant considers it demonstrably to be the case that the impacts to sediment budgets and morphodynamics will be similarly localised as they are inherently interlinked. These findings indicate that the development will not result in measurable morphodynamic changes at broader spatial scales, or over extended time horizons and support the conclusion that there will be no significant far-field impact on sediment transport or the coastline. Indeed, long-term monitoring of operational wind farms at comparable distances from shore (e.g., Horns Rev (14 km), Thanet (11 km)) have demonstrated that there are no measurable changes in shoreline morphology attributable to the presence of offshore

wind farm infrastructure. Accordingly, the Applicant considers extended morphodynamic modelling to be unnecessary, as there is no potential for the project to impact the coastline. Undertaking such modelling may potentially provide greater granularity of an academic interest, but would not advance nor materially change the conclusions already reached in the EIAR. As such, there is no change to the impacts assessed or the conclusions determined.

2.6.11 Item 6k

'Any additional modelling in relation to physical processes, which increase the existing significance of effect in that chapter and in interrelated chapters, will also require revised consideration as part of any updates in assessments associated with relevant benthic, ecology, fish and shellfish, marine mammal, ornithology assessments relevant to the various submitted EIAR chapters and the NIS.'

Response

108. The Applicant has considered additional modelling in relation to physical processes where appropriate in this **FIR Response Document** and in relevant **EIAR Addendum** and **NIS Addendum** sections pertaining to benthic ecology, fish and shellfish, marine mammals and ornithology.

2.6.12 Item 6l

'The Commission notes that option B is stated as the representative scenario for Impact 3 "Temporary disturbance to seabed resulting from pre-sweeping/sandwave levelling activities leading to increases in suspended sediment concentrations, and associated deposition", in Table 6-18. Table 6-18 summarises table 1 of Appendix 6.2, however, table 1 does not provide any justification as to how option B has a greater "total area disturbed during pre-sweeping/sand wave clearance". The applicant is requested to provide further details clarifying this matter.'

Response

109. In response to Item 6l of the FIR, WTG Option B was selected as the representative scenario for *Impact 2 (Temporary disturbance of the seabed resulting from pre-sweeping / sandwave levelling activities leading to increases in suspended sediment concentrations, and associated deposition)* and *Impact 3 (Alteration to seabed morphology during seabed preparation)*. This selection reflects that, within the array site, WTG Option B intersects a greater area of sandwaves (see **Table 4-3** of **Volume 2**, **Chapter 4 Project Description** of the EIAR), necessitating further pre-sweeping activities, and resulting in a higher degree of seabed disturbance. As outlined in **Table 1** of **Volume 4, Appendix 6.2 Representative Scenario and Limits of Deviation Assessment** in the EIAR, the total seabed area disturbed during pre-sweeping and sandwave levelling is 457,800 m² for WTG Option A and fractionally greater at 476,050 m² for WTG Option B.

2.6.13 Item 6m

'Table 6-17 of Chapter 6 lists geotechnical surveys among the potential disturbances to the seabed under impact 1, however, geotechnical surveys (which are noted as being required to confirm infrastructure locations) do not appear to be referenced further in table 6-18 or within the impact assessment set out in section 6.10. The applicant is requested to provide further details within the

impact assessment in relation to this matter and amend the relevant sections of the EIAR as appropriate.'

Response

110. The Applicant notes that geotechnical surveys are referenced in **Table 6-17** of **Volume 3**, **Chapter 6 Marine Geology, Sediments and Coastal Processes** of the EIAR as a potential source of seabed disturbance under Impact 1. Further detail on these surveys is provided in **Section 4.5.1** of **Volume 2**, **Chapter 4 Project Description**, which explains that nominal geotechnical investigations may be undertaken. These surveys are limited in scope and do not comprise a meaningful component of the overall works when compared to other activities such as pre-installation seabed preparation, cable burial, and monopile installation, which represent the primary sources of seabed disturbance assessed in **Section 6.10.1** of **Chapter 6 Marine Geology, Sediments and Coastal Processes** of the EIAR. For this reason, reference to geotechnical surveys within the impact assessment is limited, as their footprint and duration are negligible relative to the larger construction activities. The potential effects of these surveys fall within the broader disturbance envelope already assessed for Impact 1, and no separate impact pathway or amendment to the conclusions of the EIAR is required.

2.7 Item 7 Ornithology

Citations

2.7.1 Item 7a - Updating reference list

'Some citations throughout the Offshore Ornithology Environmental Impact Assessment Report (EIAR) chapter 10, Natura Impact Statement (NIS) and associated appendices, including those supporting assessment approaches, justifying sensitivities, or informing mitigation measures, are mentioned in the text but are not provided in the reference list. (Examples include: Canning et al. (2013a); Canning et al. (2013b); and Perrow et al. (2011)).

The applicant is requested to review the in-text citations throughout chapter 10 of the EIAR and the ornithology discussions in the NIS and to ensure that a complete reference list is provided for the EIAR chapter, NIS volume, and all supporting appendices.'

Response

111. The Applicant can confirm that updated and complete reference lists are included within the EIAR Addendum, and all associated Appendices, and the NIS Addendum, all of which have been reviewed and are considered complete.

112. The updated reference list to the EIAR (and associated Appendices) is provided in **Section 10.16** of the **EIAR Addendum (Part 1)**. The updated reference list to the NIS (and associated Appendices) is provided in the following sections of the **NIS Addendum**;

- **Part 1, Screening**;
- **Part 1, Assessment of Implications for SPAs** ; and
- **Part 3, SPA In-combination Assessment**

113. Additional references specific to **Section 2.7 Ornithology** of this **FIR Response Document** are included within **Section 3 References**.

Baseline data

2.7.2 Item 7b - Migratory Waterbirds & Item 7c - Terrestrial Bird Species

Item 7b: *'The Development Applications Unit (DAU) notes that a significant number of migratory waterbirds (in terms of species and absolute numbers) migrate to and from Ireland across the Irish Sea. The DAU observation raises concerns in relation to the lack of sufficient collection of empirical data in the EIAR, combined with the acknowledged low confidence levels applied in relation to avoidance rates in the migratory Collision Risk Modelling (mCRM) Tool. The DAU states the information submitted is insufficient to assess the migratory movements of birds through the development area. The DAU has concerns that the proposed development has the potential to have significant impacts upon migratory waterbirds and the Conservation Objectives of the Special Protection Areas (SPAs) for which they are listed. The DAU recommends that the applicant develops and implements more appropriate survey methodologies to detect and robustly characterise and assess the level of bird migration through the proposed development area, in order to achieve this in a satisfactory manner the Commission notes that the applicant must work collectively with the other Irish Sea Phase 1 Offshore Renewable Energy (ORE) projects.*

The Commission notes there is limited information on flux or passage of birds through the proposed array area itself during migration (east-west and north-south). The data query is only partially filled by the applicant's approach to assessing collision risk, where Geographic Information System (GIS) and straight-lines have been applied to identify potential migration pathways/flight routes to assess the proportion of flights (as a proxy for population) which may pass through the proposed array area.

Having reviewed all the information presented, the Commission requests that further assessment is carried out regarding impacts to migratory species. The applicant is requested to address the purported data gap relating to migratory birds to enable the assessment of potential impacts of the proposed development. Radar (horizontal and vertical surveys) (or similar) at the array site during peak migration periods should be utilised to provide site-specific data, which could be used to support the applicant's current assessment and provide quantitative information on passage of birds to feed into collision modelling. Should radar surveys not be conducted and an alternative survey methodology utilised, comprehensive justification for the alternative should be provided. Peak migration periods during which data are to be collected can be further informed through review of existing data and published literature relevant to the project area and region. Whilst key migration times are usually taken as being spring and autumn, the Commission considers that migration information during the winter months would also be of assistance to the assessment (e.g. irruptive cold weather movements from the continent and UK). The applicant is invited to submit additional data in this regard, setting out details of winter month migrations and/or justifying why such information is not required to inform an assessment and conclusion in relation to impacts.

The applicant should note reliance on literature to fill knowledge gaps, while useful, does not provide adequate data to ensure a comprehensive assessment of potential effects on birds.'

Item 7c: 'The DAU considers there to be deficiencies in the assessment of land-based avifauna, with Collision Risk Modelling (CRM) input data based on general assumptions. The DAU recommends additional data and consideration of survey/monitoring options such as targeted deployment of passive acoustic devices at headlands and offshore nocturnal boat transects; review of available ringing/tracking data for migratory species and/or species which are known/likely to conduct staging/dispersal movement; and thermal imaging devices (handheld/drone) surveys targeted at likely peak periods of passage.

The Commission therefore requests that further assessment is carried out regarding impacts on terrestrial bird species and, having regard to the above comments, that the purported data gap and potential impacts of the proposed development on terrestrial birds is addressed.'

Response

114. The Applicant maintains that the approach presented within **Volume 3, Chapter 10 Ornithology** of the EIAR and **Volume 5 - Assessment of Implications for Special Protection Areas - Part 1** of the NIS regarding the assessment of collision impacts to migratory waterbird species remains appropriate and is based upon suitable application of the best available scientific evidence relating to migratory passage by this group of receptors over the Irish Sea.

Context – Nature and scale of the baseline for migratory waterbirds and terrestrial species

115. The Irish Sea is not a major migratory corridor for waterbirds or terrestrial species in relation to continental scale migratory passage (van Roomen *et al*.,2025). For waterbirds, the area represents a spur of the East Atlantic Flyway, with most migration occurring between Ireland, Iceland, and Arctic Canada. The array site lies northeast of key wintering sites and south of primary breeding sites for migratory species. For terrestrial species, Ireland is on the periphery of western migratory networks (Busse, 2001), and passage through the array site is limited. This is evidenced by the findings of targeted migration surveys undertaken in 2025 in response to the Commission's FIR (see Table 2 of this **FIR Response Document** and **Appendix 10-B Migration Report** of the **EIAR Addendum**).

116. Any assessment of impacts on migratory birds must be considered at the scale of the migration corridor; in this instance, the East Atlantic Flyway (EAF), in order to provide a robust and suitable precautionary assessment of potential collision risk for the operational phase of the project.

117. The rationale for using a model-based approach to mCRM is provided in **Chapter 10 Ornithology** of the EIAR. This rationale explains that, given the relatively small spatial scale and long temporal scale of offshore wind farm development, modelling-based approaches are the most robust method for assessing potential impacts.

118. The Applicant has used a migratory corridor-based approach, supported by appropriate modelling and published empirical data (which are matched to the region being assessed, and therefore the site), which provides a robust and appropriate baseline of migratory activity within the region (and therefore the site).

119. Regarding the level of confidence surrounding the avoidance rates of migratory species, the Applicant acknowledges that this is generally low. Uncertainty associated with these rates is due to, not only the inherent logistical difficulties in obtaining data relating to how many collisions by each migratory species occur at offshore sites, but also difficulties associated with determining how many individuals of each species pass through active OWFs. Despite these difficulties, recent studies using radar and camera technologies in the Baltic and eastern North Sea (where migratory passage rates are much greater than those over the Irish Sea) report collision rates for migrant species in general to be extremely low (Liedtke *et al.*, 2025 ; Vattenfall, 2024), supporting conclusions that avoidance rates typically used in mCRM are conservative.

120. The Applicant highlights that mCRM approaches (which are considered most appropriate for use in assessing collision impacts to migratory receptors) were developed in cooperation with other Phase 1 projects..

Migratory waterbirds and terrestrial species – justification of the use of literature as the primary source of empirical data for baseline characterisation

121. With regards migratory waterbird baseline data more specifically, the Applicant considers the assessment to be based upon sufficient empirical data, by virtue of the data sources and methods used being similarly based on empirical data. The Applicant also notes that the assessments use empirical observations of migratory species collected during surveys undertaken within or surrounding the array site, alongside broad-scale empirical data.

122. Bird migration is a broad-scale spatial phenomenon. The routes and timings of migratory movements vary both spatially and temporally, and cannot therefore be robustly characterised by short-term, site-specific surveys alone. In considering available data, analyses of ringing recoveries and long-term migration datasets demonstrate that movements of wildfowl, waders and passerines across Ireland and Britain are highly variable between years and are influenced by weather, population dynamics and large-scale ecological factors (Wernham *et al*., 2002; Thorup & Romdal, 2022). Ringing data from the British Trust for Ornithology (BTO) and Irish observatories show that species such as whooper swan (*Cygnus cygnus*), Greenland white-fronted goose (*Anser albifrons*) and wader species including curlew (*Numenius arquata*) and redshank (*Tringa totanus*) observed at Irish wintering sites are connected to breeding grounds in Iceland, Greenland, and Siberia (NPWS, 2013; Irish Wader Ringing Projects).

123. **Volume 3, Chapter 10 Ornithology** of the EIAR provides a robust assessment, of potential collision impacts upon migratory waterbird species, including wildfowl (i.e. ducks, geese and swans) and waders, as they transit through the array site during migration periods. This assessment is based on an appropriate and proportionate characterisation of the migratory waterbird assemblage.

124. On the basis of both the published empirical data utilised to inform the assessment, as well as the model-based methodologies presented, it is considered by the Applicant that the assessment approach adopted is appropriate and valid. Site specific surveys completed in 2025 (**Table 2**) validate the baseline characterisation in the EIAR. Further rationale and supporting evidence of the robustness of the assessments is outlined below.

Migratory waterbirds - Justification for not submitting Radar surveys

125. The Applicant acknowledges the Commission's suggestion on the use of radar as a potential means of measuring migration within the vicinity of the CWP Project. While radar can provide useful information on migration timing and intensity in small spatial and temporal space, it is not an effective tool for quantifying migration through the proposed array site. A full account as to the non-utility of radar as a means of measuring migratory flight activity across the array site is provided in **Appendix G - Utility of Radar** of this **FIR Response Document**.

126. In light of the evidence described in **Appendix G**, the use of radar in quantifying migratory movements across the array site would not materially improve the robustness of the existing assessment and that the assessment of collision impacts to migratory waterbird species remains appropriate.

127. In that regard, the Applicant also considers it important to reflect on the difference between characterisation surveys, i.e. surveys that characterise the baseline receiving environment for the purposes of EIA, and monitoring baseline surveys, i.e. those surveys that provide data for the purposes of monitoring such as Before After Control Impact survey designs. The Applicant considers radar to potentially provide useful data for the latter in areas with a substantive migratory flyway, but considers small-scale site-specific radar to be inappropriate for the purposes of characterisation. This nuance appears to be inadequately considered in the monitoring guidance (Guidance on Marine Baseline Assessments and Monitoring Activities for Offshore Renewable Energy Projects (Parts I and II) (Department of Communications, Climate Action and Environment 2018), but forms part of the Chartered Institute of Ecology and Environmental Management (CIEEM) Guidance for Ecological Impact Assessment which draws a clear distinction between monitoring and baseline characterisation (CIEEM, 2018). A similarly helpful distinction is made within the Environment Protection Agency (EPA) Guidance (EPA, 2022) which notes that in describing the baseline *The baseline scenario refers to the current state of environmental characteristics* and *The description of any aspect of the environment*

should provide sufficient data to facilitate the identification and evaluation of the likely significant effects on that topic.

Migratory waterbirds and terrestrial species - Justification of alternatives to radar surveys

128. Whilst the Applicant has not conducted radar surveys, a suite of alternative data collection methods has been used which is considered to be both robust and in accordance with relevant guidance (see below). The Applicant notes, for example, that the Irish guidance on marine baseline ecological assessments and monitoring activities for offshore renewable energy projects (Part II) places emphasis first on digital and visual surveys, which can be supplemented with additional remote data methods where these are proportionate (Section 5.1 under *Survey Methods*). The guidance places emphasis on European Seabirds at Sea (ESAS) surveys (Section 5.1.1), which the Applicant has acquired both to inform the application and more recently to validate those data. Similarly, the Applicant has undertaken land-based vantage point surveys, from elevated vantage points (Box 8 of Section 5.1.2) to inform the assessment and more recently to validate those data, as emphasised under Section 5.1.3 of the guidance. Whilst the Applicant notes that the DAU has referred to radar, the guidance notes only that these may be used to compliment surveys and provide additional ornithological understanding; the Applicant considers radar to be potentially informative for baseline and impact monitoring in locations with a substantive migratory flyway such as Denmark, but not for characterisation.

129. In FIR section 7b, the Commission note that DAU purport a lack of empirical data relating to migratory species from the array site. However, it is considered that a site-only approach as a baseline for migratory species is not sufficiently robust to inform an assessment of collision risk.

130. Nevertheless, in response to FIR 7b and as described in **Table 2**, the Applicant has undertaken a comprehensive suite of additional migratory data collection to validate the existing baseline characterisation, including:

- Land based vantage point surveys for migratory birds
- Boat based visual surveys for migratory birds from within the array area
- Boat based acoustic surveys for migratory birds

131. These surveys are detailed in **Appendix 10-B Migration Survey Report** of the **EIAR Addendum**, and summarised in the EIAR Addendum. In summary, the data collected during the suite of migration surveys collectively indicated low levels of movement through the array site during both day and night. The low observed passage rates from 2025 surveys supports the conclusions from the approach taken in the EIAR that the risk of collision is very small, including the precautionary mCRM, and align with empirical evidence of broad front migratory patterns within the region.

132. This composite dataset, of site specific and broadscale data, includes data collected during peak migration periods and winter months, which are characteristic of the baseline. Aligning surveys with irruptive cold weather from the continent and UK is demonstrative of the challenge of using site specific survey methods; whilst these events are captured within the broadscale empirical data they cannot be assured within a 24-month EIA characterisation.

Migratory waterbirds and terrestrial species – consideration of winter movements

133. The Commission requested that further consideration was given to within-winter migration, with an emphasis on movements during spells of particularly cold weather. Within-season cold-weather movements typically occur in relation to prolonged periods of temperatures below zero degrees Celsius, where the freezing of waterbodies results in them becoming unsuitable for use by migratory waterbird species, or in relation to extensive snow and ice coverage. As such conditions occur only very infrequently in the countries immediately surrounding the Irish Sea, within-season cold-weather movements by large proportions of the wintering populations of migratory bird species in those countries are considered to be, at most, infrequently occurring events. Consequently, rates of passage

through the Project array area associated with such movements will be negligible and any impacts from such passage would not lead to population-level effects to the species concerned. It is also likely that such events will become increasingly infrequent due to climate change effects on cold weather patterns across Ireland and Great Britain. Meteorological projections suggests that the conditions associated with cold weather movements will decline in frequency. Winters in the UK are projected to be 1°C to 4.5°C warmer by 2070 compared to the climate in 1990 (MET Office, 2025), which further reduces the likelihood of significant winter passage through the array site during the operational phase.

134. The information presented above and, in the appendices, does not necessitate an update to the EIAR assessment of impacts to migratory terrestrial or waterbird species and the conclusions presented in the application remain valid.

NIS Context

135. To quantify the risk of collision to migratory terrestrial and waterbird Special Conservation Interest (SCIs), migratory collision risk modelling has been carried out at a regional scale, using the mCRM tool (Caneco, 2022). Migratory population sizes for each SCI have been adjusted for migratory pathways over the western Irish Sea (Burke *et al*., 2018). Detailed methods on the adaptation and application of the mCRM tool are provided in **Volume 4, Appendix 10.3 Collision Risk Modelling** of the EIAR. This assessment methodology represents an appropriate, precautionary and scientifically robust approach, which draws upon long time series datasets collected over appropriate spatial scales to characterise migratory movements. In light of the evidence laid out above in relation to the EIAR, the impact assessment provided for operation and maintenance migratory collision risk within **Volume 5 - Assessment of Implications for Special Protection Areas - Part 2** of the NIS remains valid, along with the conclusion of no Adverse Effects on Site Integrity (AESI) for the project alone.

136. The potential for in-combination collision risk to migratory terrestrial and waterbird SCIs has been assessed against the Conservation Objectives and population attributes of the relevant SPAs within the NIS, and as updated in the **NIS Addendum (Part 3)**. The regional migratory collision risk assessment represents current best practice for quantifying collision risk for migratory species at large spatial scales (e.g. advocated in NatureScot, 2025). Results from the mCRM demonstrate that predicted collision mortality for all assessed species is very small and negligible relative to regional flyway populations and SPA-specific SCI populations.

137. The North Irish Sea Array (NISA) OWF project has similarly completed its own cumulative mCRM, using an alternative, but technically robust, modelling framework (See **Appendix F Offshore and Intertidal Ornithology Cumulative Migratory Collision Risk Modelling** of this **FIR Response Document**). Despite minor methodological differences, NISA similarly reports very low levels of predicted collision mortality for all relevant migratory species, with impacts falling below thresholds which might compromise achieving or maintaining of SPA Conservation Objectives and/or attributes.

138. Other available Irish Sea Phase 1 migratory collision estimates (e.g. planning applications for Oriel, Dublin Array, and Arklow 2) are similarly very low, due to low predicted migratory flux. Despite the mCRM having been undertaken by the other Phase 1 projects on a precautionary basis, resultant predicted migratory collision mortality is considered to be *de minimis*, relative to assessed population sizes. This is consistent with findings from emerging project-level migratory CRM studies (Olley *et al*., 2024). When considered together, the combined mortality across the Phase 1 projects remains very small and within levels that would not be expected to give rise to negative population-level effects, when considered in combination.

139. When considering the very small magnitude of predicted migratory collision risk from the proposed development alongside the similarly negligible contributions from other Irish Phase 1 projects, there is no pathway by which in-combination migratory collision mortality could undermine the achievement or maintenance of the Conservation Objectives of any SPA supporting migratory SCIs. The scale of any

predicted impact is insufficient to affect population attributes, impede recovery trends, or compromise long-term viability.

140. On the basis of the best available scientific evidence, the predicted impact from the proposed development on migratory bird populations, in combination with other Irish Phase 1 offshore wind projects, will not result in an adverse effect on the integrity of any designated site.

2.7.3 Item 7d - Baseline Data Vintage

'*The Commission queries the age and relevance of the submitted aerial and boat-based survey data used in the application, in particular considering the 2022 Highly Pathogenic Avian Influenza (HPAI) season, which had significant negative impacts on a range of seabird species. The applicant is requested to provide justification that the original digital aerial survey and boat-based data remain relevant and appropriate at the point of submitting additional information to support the proposed development*.'

Response

141. The Applicant undertook digital aerial surveys (DAS) and boat-based European Seabirds at Sea (ESAS) surveys to support the EIAR. The data from these surveys were used to predict impacts on seabird populations that were compared to population size estimates of those populations. Thus, the impact assessment used in the application was based on suitable comparisons of predicted impacts to seabird population estimates. To determine whether the results from these surveys remain valid and support updated assessments in response to further information requests, the Applicant has undertaken additional surveys as described in **Table 1** of this **FIR Response Document**. These include DAS and boat-based ESAS breeding season surveys of the Array Site and surrounding buffer areas, and intertidal surveys of the export cable landfall area in South Dublin Bay. Furthermore, a comprehensive review of available data such as the ObSERVE survey made available since the planning application was submitted in September 2024. By comparing data from these more recent surveys and desk-based reviews to the relevant baselines used to inform the EIAR (**Volume 4, Appendix 10.5 Offshore Ornithology Baseline Characterisation Report** of the EIAR), the Applicant demonstrates that the baseline characterisation remains valid.

142. **Appendix 10-D Baseline and contemporary data comparison** of the **EIAR Addendum** provides a direct comparison between the baseline data (upon which the assessments were based) and the contemporary data (collected as a means of validating the baseline data). Comparisons are drawn between the following datasets which were referenced in **Volume 4, Appendix 10.5 Offshore Ornithology Baseline Characterisation Report** of the EIAR:

- Seasonal peak abundances (used to inform the displacement assessment) derived from DAS data;
- Flight densities (used to inform the CRM assessment) derived from DAS data;
- Numbers and distributions of intertidal waterbirds (used to inform the intertidal landfall assessment) derived from intertidal landfall surveys; and
- Numbers and distributions of post-breeding terns (used to inform the assessment of impacts to those receptors within South Dublin Bay).

143. In all cases, the contemporary data collected validates the baseline datasets described and assessed in the EIAR (and NIS), with the species observed, as well as numbers and distributions thereof being either similar (in the case of the intertidal environment) or smaller (as is the case in the offshore environment).

144. The particular concern of the effects of the 2022/23 HPAI event are noted. HPAI impacts in these years resulted in acute impacts to some Irish Sea seabird breeding colonies, in the form of increased adult mortality and/or reduced productivity (caused by adult mortality). Although HPAI continues to circulate in UK and Irish seabird populations, the number of mortalities attributed to HPAI from 2024 onwards has fallen to very low levels in comparison to those noted in 2022/23 (UK Gov, Animal and Plant Health Agency, 2026).

145. Data relating to the demographic consequences of HPAI impacts to Irish Sea seabird populations during 2022/23 are limited, as few long-term survival rate monitoring studies are operating within this region. One study is undertaken for the breeding guillemot population of Skomer Island in Wales (Birkhead & Hatchwell, 2025). At this site, a late 2023 breeding season HPAI outbreak was estimated to have resulted in the loss of 20-30% of the established breeding guillemot population (Birkhead & Hatchwell, 2025). The additional mortality due to HPAI was, however, not reflected in an equivalent reduction in breeding colony size in the following year, as there was evidence of additional recruitment into breeding colonies as younger birds occupied sites left vacant by HPAI deaths.

146. Such instances of recovery from acute population impacts are consistent with theoretical predictions relating to the ecology of colonial seabirds and widely supported by empirical studies of seabird population dynamics (Furness, 2023). Monitoring undertaken at Irish east coast breeding colonies in 2025 further indicates recovery at breeding seabird sites within the region (such as Howth Head, Ireland's Eye, Bray Head, Lambay and Wicklow Head) which may have been affected by HPAI in 2022/23. Populations of species known to have been affected by HPAI (such as guillemot, kittiwake, razorbill, herring gull and gannet) were generally higher in 2025 than in 2024 and for the most recently available counts which preceded the 2022/23 HPAI event (Preston *et al*., 2025; Arklow, 2026). As such, local seabird populations, if affected by HPAI in 2022/23, appear to have recovered to pre-2022/23 HPAI outbreak sizes by the 2025 breeding season.

147. The Applicant also directs the Commission to Natural England guidance on the treatment of HPAI in impact assessment to seabirds (Natural England, 2022) which states that if breeding colony sizes are impacted by HPAI [which seems unlikely in relation to the 2022/23 event when construction or operational phase impacts from the Project would come into effect, given that local populations appear to have already recovered from this acute impact] "*… the scale of impact is likely to remain in proportion to the size of the colony. For instance, if a population were reduced by 10% then we would expect 10% fewer collisions.*"

148. Therefore, while affected populations may have been reduced by the effects of HPAI, assessment of impacts on these smaller populations would need to be based on predicted impacts derived from survey data contemporary with the smaller (post-HPAI) population size estimates. Since the assessment of impacts uses population models (as part of the Population Viability Analysis (PVA)) the predicted effects are analysed through changes to population demographics (i.e. survival rates) and not to population size itself. Thus, the PVA takes account of changes in projected population size (both up and/or down) by using the same impact on the survival *rate,* rather than the absolute predicted impact size. If HPAI has reduced some seabird population sizes, the absolute impacts on those populations should scale with the reduction in population size. Therefore, by comparing the predicted impacts using data collected before HPAI with population sizes also estimated before HPAI suitable contemporary assessments have been undertaken within the EIAR and NIS.

149. Full details of the baseline data comparisons are available in **Appendix 10-D Baseline and contemporary data comparison** of the **EIAR Addendum**. In the case of both the intertidal and offshore environments, the conclusions of the EIAR and NIS assessments derived from the baseline data remain unchanged.

2.7.4 Item 7e - Roseate Tern

'*Breeding Roseate Tern (Sterna dougallii) is a Special Conservation Interest (SCI) of the Rockabill SPA, which supports a population of 1,642 breeding pairs (Burnell et al., 2023). Roseate Tern migrate across the Irish Sea including between this colony and Coquet Island SPA (188 breeding pairs) in the UK. Migrating Roseate Tern may pass through the Codling Wind Park (CWP) array site (Redfern et al., 2020). While Roseate Tern usage of the array site can be informed by Digital Aerial Survey (DAS) data, these data are not appropriate to inform passage of migratory birds through an area. The applicant does not appear to have considered any Roseate Tern tracking studies (e.g., Redfern et al., 2020) in their assessment.*

The Commission requests that the applicant obtains or sources additional information on Roseate Tern flux/passage through the CWP array site and submits revised assessments fully informed and updated by the additional Roseate Tern data.'

Response

150. The applicant maintains that the approach presented within **Volume 3, Chapter 10 Ornithology** of the EIAR and **Volume 3 – Screening** of the NIS to screen out collision risk impacts with WTGs resulting in injury or fatality for roseate tern (*Sterna dougallii*) remains robust and based on the best available evidence on the density of flying birds in the array site and their risk of collision.

151. The screening approach used for collision risk in **Chapter 10 Ornithology** of the EIAR was based on the density of flying birds (including terns) recorded during baseline surveys within the CWP array site and consideration of their assessed risk from collision, relating to flight heights. For roseate tern, a single bird was recorded in flight during DAS surveys outside of the array, within the 2 km buffer area (**Volume 4**, **Appendix 10.5, Offshore Ornithology Baseline Characterisation Report** of the EIAR). No roseate terns were recorded within the array site during baseline DAS surveys or boat-based European Seabirds at Sea (ESAS) surveys; this is similarly confirmed in the more recent surveys undertaken in 2024 and 2025 (**Appendix 10-D Baseline and contemporary baseline comparison** of the **EIAR Addendum**). Therefore, a density of 0 was used for the estimated peak monthly density of birds in flight in array site birds/km^{2,} below the 0.1 bird per km^2 screening threshold. A comprehensive literary search yielded no species-specific information relating to collision risk for roseate tern. In line with industry best-practice, collision parameters of closely related and physiologically very similar species were used as a proxy; namely common tern (*Sterna hirundo*) and Arctic tern (*Sterna paradisaea*). Both of these species have a low percentage of flight activity at potential collision height (PCH) (0.41 – 0.76% at PCH).

152. Tracking data for roseate terns were not considered in this screening decision due to no roseate tern colony being within foraging distance (mean maximum foraging range + 1 SD = 23.2 km; Woodward *et al*., 2019) of the array site (i.e. the closest SPA with roseate terns as a designated feature (Rockabill SPA) is 47.36 km to the north of the array site). Furthermore, there is uncertainty about the resolution of geolocators suitable for terns (i.e. required to confirm migrating birds fly through the array site) and the possible risks associated with undertaking further tagging studies (i.e. some studies on terns have shown tag effects including egg damage and reduction in body mass (Nisbet *et al.,* 2011; Paton *et al*. 2020).

153. Notwithstanding the above, the Applicant has sought to address the Commission's request and has sourced additional literary information on roseate tern flux/passage through the CWP array site and has revised assessments fully informed and updated by this additional data. The sources cited and a summary of the revised assessment of roseate tern collision risk is presented below.

EIAR Context

154. As outlined in the introductory FIR response paragraphs above, the Applicant has sought to address the Commission's request by carrying out a revised assessment on the impacts of collision upon the regional population of roseate tern. This collision assessment can be found in **Section 10.10** of the **EIAR Addendum (Part 1)**, while a full account of the Collision Risk Modelling (CRM) carried out for this receptor can be found in **Appendix 10-K Roseate Tern Collision Risk Modelling** of the **EIAR Addendum.**

155. Roseate tern are assessed as having medium sensitivity to collision impacts. In terms of magnitude, the maximum increase to baseline mortality for the regional baseline population through project-only collision impacts was estimated to be 0.069%. This level of potential impact is therefore assessed to be negligible. On this basis, project-only collision impacts to roseate tern are assessed as being imperceptible and not significant in EIA terms.

156. Project-only impacts are assessed as being of imperceptible significance and as such do not meet the criteria for inclusion within cumulative impact assessment outlined within **Section 10.11** of **Volume 3**, **Chapter 10 Ornithology** of the EIAR. Any contribution made by the CWP Project would be inconsequential and nugatory. Therefore, roseate tern remains screened-out of the CEA for cumulative impacts for collision with the array site during the operation and construction phase (see **CEA Report (Part 2)**).

NIS Context

157. The applicant has revised the screening for roseate tern in the **NIS Addendum (Part 1)** in response to the Commission's FIR. Roseate tern has now been screened-in to the **NIS Addendum** for potential collision impacts on this breeding feature at Rockabill SPA and Coquet Island SPA (**NIS Addendum, Part 1** and **Part 3**). A new section assessing Coquet Island SPA has also been added to the **NIS Addendum (Part 1** and **Part 3)**.

158. For both Rockabill SPA and Coquet Island SPA, the results presented in **Appendix 10-K Roseate Tern Collision Risk Modelling** of the **EIAR Addendum**, which also inform the **NIS Addendum**, show that any additional mortality to the roseate tern SCI of each SPA resulting from collision with operational WTGs is estimated to represent a very small potential increase (much less than 1%) to the baseline mortality rates at each SPA.

159. Therefore, for both Rockabill SPA and Coquet Island SPA, it is concluded that that there is no impediment to the respective Conservation Objectives being met for this SCI and, in turn, that there is no project-only AESI for roseate tern at either SPA.

2.7.5 Items 7f and 7k – Red-throated Diver

160. These FIR items are addressed in tandem:

Item 7f

'Red-throated Diver (Gavia stellata) is a species known to be highly sensitive to offshore wind farm developments due to displacement effects. A 4 km buffer is applied in the project specific DAS used to inform the baseline in the CWP application. The Commission note that for Red-throated Diver, the best available advice as presented in the UK Joint SNCB 'Interim Advice On The Treatment Of Displacement For Red-Throated Diver' (SNCB, 2022) states that:

"For non-breeding Red-throated Diver, a pragmatic displacement buffer of at least 10 km is recommended for use in site characterisation, impact assessments and post-consent monitoring where a plan or project is within 10 km of a Special Protection Area (SPA) designated for non-breeding red throated diver."

The Commission notes that the proposed development is located within 10km of The Murrough SPA, for which wintering Red-throated Diver is an SCI. The SPA supports a wintering population of up to 131 individuals based on the ObSERVE programme data or up to 215 individuals based on the Irish Wetland Bird Survey (I-WeBS) data (NPWS, 2024).

The applicant is requested to obtain and analyse additional data on Red-throated Diver density and abundance to fill the data gap between 4km and 10km to the west of the array site (i.e., in the direction of The Murrough SPA). It may be possible to obtain suitable data from existing studies, such as the ObSERVE programme aerial survey data collected in 2016, 2017, 2021, 2022 and 2023 (Jessopp et al., 2018, and Giralt Paradell et al, 2024). The applicant is also requested to provide justification that any data obtained and used to fill the data gap is suitable and fit for purpose. The additional data should be used to update and revise the impact assessment from the proposed development in relation to displacement of Red-throated Diver from The Murrough SPA and within 10km of the array area boundary (refer also to Item 7(k) below).'

Item 7k

'In the EIAR, displacement of Red-throated Diver is assessed, where effects up to 4 km from the array site are considered. However, it is well-evidenced that displacement impacts can occur at much greater distances, for example: Heinänen et al. (2016); Žydelis et al. (2016); Mendel et al. (2019); Heinänen et al. (2020); and Vilela et al. (2020).

The Commission therefore requests that the applicant reconsiders its assessment of displacement effects on Red-throated Diver associated with the array site. Red-throated Diver is highly sensitive to displacement effects associated with OWFs and vessel traffic (e.g., Furness et al., 2013; Bradbury et al., 2014; Fliessbach et al., 2019). The applicant is requested to assess displacement effects up to 10km from the proposed array site during operation, with the assessment informed by additional data, as discussed in Item 7(k) above.

In the NIS, displacement of Red-throated Diver at The Murrough SPA is assessed using the Displacement Matrix approach, where the applicant has applied a 50% displacement and 1% mortality rate to an estimated proportion of the SPA population which is within 10 km of the CWP array site. The applicant has used the most recent 10 year (winter 2011/12 to 2020/21) peak mean from the I WeBS data (74 individuals) as the SPA Red throated Diver population. The proportion of the SPA that is within 10 km of the array site (37.06%) has been used to determine the proportion of the Red throated Diver population which may be displaced. The applicant has calculated that 50% displacement and 1% mortality of 37.06% of the Red-throated Diver population (27.42 individuals) equates to an annual mortality of around 0.14 individuals. The Commission has concerns regarding the methodology and assumptions made in this assessment, as outlined below:

1. *The Red-throated Diver population of The Murrough SPA is 131 individuals (NPWS, 2024), as informed by the ObSERVE programme data. Impacts should be assessed against this population, rather than the 10-year mean from the I-WeBS data, which may not fully account for individuals further from the coast or the survey observation points.*
2. *The assessment is based on the assumption that Red-throated Diver density and distribution is uniform across The Murrough SPA. This is not the case, the ObSERVE programme data show clear variation in density in the SPA (Jessopp et al., 2018).*

3. *Displacement should not only consider the response of individuals to a stimulus, but it should also consider the characteristics and importance of the area they are displaced from. For example, the population-level effect is likely to be of lower significance if birds are displaced from an area of low suitability supporting habitat than from an area of key foraging habitat.*

In response to these issues, the Commission requests the applicant to undertake the following:

i. *Impacts should be assessed against the Red-throated Diver population value of 131 individuals as informed by the ObSERVE programme data.*
ii. *The applicant must consider the variable density and distribution of the wintering Red-throated Diver throughout The Murrough SPA when assessing displacement effects up to 10km from the array site.*
iii. *The Commission requests that the applicant obtains/sources and analyses appropriate and robust Red-throated Diver abundance and distribution data covering the overlap between the 10km buffer around the CWP array site and The Murrough SPA. The results of the review and analyses can provide important insight into the importance of the area where the SPA overlaps the 10 km buffer to inform the Appropriate Assessment (AA) conclusions.*
iv. *The Commission requests that the applicant considers supporting habitat within The Murrough SPA, specifically the proportion of the SPA which is within 10 km of the CWP array site. An updated and comprehensive assessment within the NIS is required based on these considerations, discussion on confidence of the assessment, acknowledgement of limitations or data gaps, and justification for assessment methods. The updated assessment must include environmental data pertaining to wintering Red-throated Diver supporting habitat.*

The approach outlined above may entail obtaining the most recent ObSERVE programme aerial survey data to understand density in the easternmost 2.5 km of The Murrough SPA. The assessment could also be supported by additional site-specific survey data covering the wintering distribution and abundance of Red-throated Diver within The Murrough SPA and within 10 km of the CWP array site. Additional environmental data associated with Red-throated Diver distribution and abundance (i.e. supporting habitat), combined with Red-throated Diver observation data and/or a literature review could also be used to better understand the importance of this specific area and its ability to support wintering Red throated Diver.'

Response

161. The Applicant acknowledges that, following the seaward extension of The Murrough SPA in 2023, offshore areas of this site now fall within 10 km of the western edge of the CWP Project array site. Assessments for Red-throated Diver have been updated as detailed in **Section 10** of the **EIAR Addendum (Part 1)** and supported by **Appendix 10-I Design-based Density, Abundance Estimates and Distributional response of the Red-throated Diver** and **Appendix 10-J Parametrisation of Red-throated Diver Displacement Rates** of the **EIAR Addendum**. The assessment is based on the baseline characterisation used to inform the EIAR, and additional data collected since the planning application was submitted to the Commission in September 2024 as described below (see also **Table 2** of this **FIR Response Document**).

162. DAS have been undertaken to allow consideration of potential displacement impacts within the array site and out to a 10 km buffer to the west, plus over inshore parts of the marine extent of The Murrough SPA (see **Plate 2**). This data supports the requested assessment of displacement effects up to 10 km from the array site during the operation and maintenance phase.

163. Contemporary empirical DAS data from the 2024/25 winter period have been used in this re-assessment. By collecting this additional data the Applicant has addressed the Commission's request

to obtain appropriate data covering the overlap between the 10 km buffer around the CWP Array Site and the Murrough SPA (Request *iii* of FIR 7k, above).

164. Supporting habitat for red-throated diver has also been fully considered within the revised assessment, with nearshore and offshore areas of sandy substrate, less than 20 m in depth and lying outside the busy north-south shipping lane being considered as optimal for this species. By considering the distribution of supporting habitat within the revised survey area, and specifically the proportion of The Murrough SPA which is within 10 km of the CWP Array Site, the Applicant has addressed the Commission's request that updated assessment includes consideration of environmental data pertaining to non-breeding red-throated diver supporting habitat (Request *iv* of FIR 7k, above).

165. Raw data (in the form of individuals counted) for DAS undertaken in the 2025/26 non-breeding season (up to and including Feb 2026 to provide a composite of two further winters of data) and covering the Array Site and a surrounding 10 km buffer (but not the entirety of The Murrough SPA) accompanies this FIR response (**Appendix 10-D Baseline and contemporary data comparison** of the **EIAR Addendum**). These data correspond with the analysis described for the 2024/25 winter period insofar that during the 2025/26 non-breeding period very limited numbers of red throated diver were recorded, with similar numbers of individuals within the offshore are of the Murrough SPA which lies within a 10 km potential displacement distance around the Array Site. As such, further analysis of 2025/26 non-breeding DAS data would not meaningfully alter the analysis submitted.

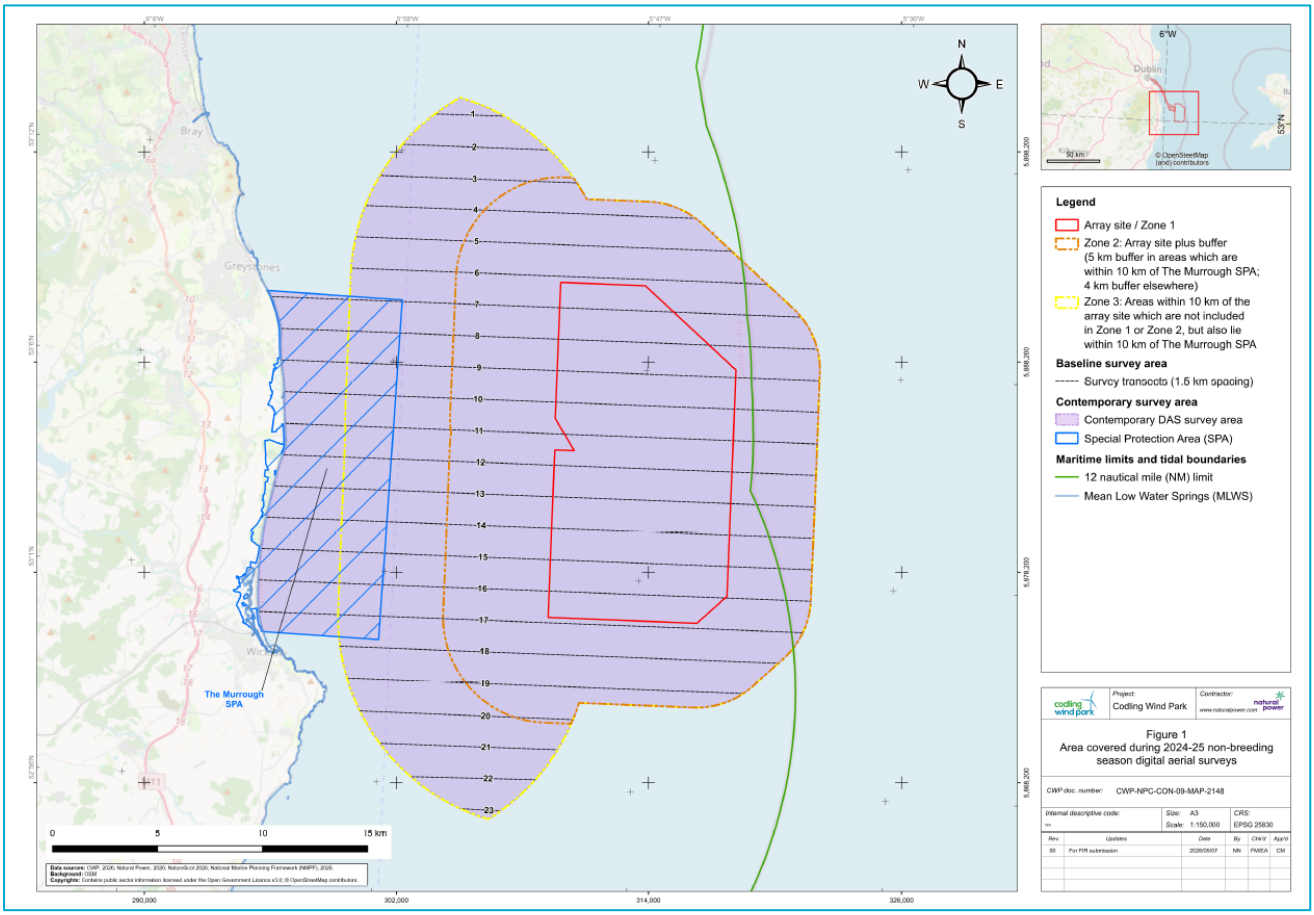


Plate 2 Area covered during 2024-25 non-breeding season digital aerial surveys

166. Data from these surveys have been used to update and revise the assessments of displacement impacts to the regional red-throated diver population (for the EIAR) and to the designated population which constitutes a SCI of The Murrough SPA (for the NIS). These revised assessments are presented within the **EIAR Addendum (Part 1)** and **NIS Addendum (Part 1)** respectively with supporting information presented in **Appendix 10-I Design-based Density, Abundance Estimates, and Distributional Response of the Red-throated Diver** and **Appendix 10-J Parameterisation of Red-throated Diver Displacement Rates** of the **EIAR Addendum**. Variable density and distribution of red-throated diver has been taken into account in these assessments, having been considered within the appropriate supporting appendix and data validation exercise.

EIAR context

167. Within the context of the EIA framework, the Applicant has evaluated the magnitude of potential displacement impacts to red-throated diver on the basis of estimated abundances within the array site and supporting suitable red-throated diver habitats within a 10 km buffer.

168. Displacement behaviours exhibited by red-throated divers vary with proximity to WTGs, as well as in response to OWF layout, including WTG spacing and the size of WTGs (Hall, 2024; O'Brien *et al*., 2018). In order to account for this graduated response, the Applicant has calculated specific displacement rates within concentric zones of increasing distance from the array site. Full details of the displacement mortality methodology and rationale used to inform the updated impact magnitude for red-throated diver are provided in **Section 10.10.3** of the **EIAR Addendum (Part 1)**.

169. The data gap relating to the displacement of red-throated diver from suitable habitats within 10 km buffer and in relation to the Murrough SPA has been addressed through an additional, targeted DAS campaign and subsequent analysis through a revised displacement methodology (see **Appendix 10-J Parameterisation of Red-throated Diver Displacement Rates** of the **EIAR Addendum**). The resultant re-assessment found that the magnitude of displacement impact remains low and therefore unchanged from **Section 10.10.3** of the EIAR.

170. The receptor sensitivity of this species remains unchanged from the EIAR (high sensitivity).

171. Although the revised assessment of red-throated diver displacement covered a larger area (suitable habitats within a 10 km buffer of the Array Site), the overall displacement impact was found to be smaller than was the case in the original EIAR, wherein impacts were assessed within a uniform 4 km buffer around the Array Site. This counterintuitive seeming outcome results from a more precautionary, higher displacement rate (100%) being applied uniformly within the much smaller 4 km buffer as part of the original assessment. The rationale being that, although the original assessment only covered areas within 4 km of the array site, by having a more conservative (higher) displacement rate within the assessed area, this would account for impacts ranging beyond the 4 km buffer, as it is known that red-throated diver may exhibit displacement responses across these larger distances. Furthermore, numbers of red-throated diver recorded during the winter 2024/25 DAS campaign were smaller than those upon which the original EIAR assessment was based. A full account of the manner by which inter-annual variation and levels of conservatism have been accounted for is provided in **Section 10.10.3** of the **EIAR Addendum (Part 1).**

172. The resulting impact significance remains as slight, which is not significant in EIAR terms; this conclusion corresponds with that of **Chapter 10 Ornithology** of the EIAR.

NIS context

173. The Applicant has taken account of contemporary, site-specific, DAS data collected during the 2024/25 non-breeding season, further validated with data from the 25/26 non-breeding season, to quantify the occurrence of red-throated diver within the following regions:

- The Murrough SPA; and
- Areas where 10 km buffers from both The Murrough SPA and the array site overlap.

174. The original NIS assessment for disturbance and displacement impacts to the red-throated diver SCI of The Murrough SPA assumed an even distribution of birds within the SPA. Site-specific DAS data, alongside contextual reference to the ObSERVE survey data, demonstrate that birds utilise shallower waters within nearshore areas of the SPA, as well as Codling Bank itself, whilst avoiding the busy north-south shipping lane which lies at the eastern edge of the SPA and beyond the 10 km buffer from the array site.

175. The reassessment of displacement impacts to red-throated divers utilises a stepped approach to the assessment of different levels of displacement with increasing distance from the array site. This approach has been informed by empirical displacement information from operational projects, particularly sites located across the Irish Sea off the western UK mainland. More details on the methodology used to reassess disturbance and displacement impacts to red-throated diver are provided within **NIS Addendum (Part 1)**. By undertaking the assessment in this way, the Applicant has considered the variable density of non-breeding red-throated diver throughout The Murrough SPA when assessing displacement impacts (Request *ii* of FIR 7k, above).

176. Whilst useful context, it is considered by the Applicant that the utilisation of site-specific DAS data in the assessment of red-throated diver non-breeding season abundance within The Murrough SPA provides a more methodologically robust approach, based on the best available scientific data, than using the ObSERVE data (Jessopp, 2018). This is due to the higher resolution of the site-specific data (whereas the SPA red-throated diver population from ObSERVE data has been determined through two transects across the site). Furthermore, site-specific DAS data account for distributional variability throughout not only The Murrough SPA itself, but areas within 10 km of the SPA which overlap with a 10 km buffer from the array site. As requested by the Commission, this revised assessment includes consideration of impacts against the designated SPA population of 131 individuals derived from ObSERVE programme data (Request *i* of FIR 7k, above), and in relation to the peak red-throated diver population of The Murrough SPA estimated from contemporary DAS datasets (211.64 individuals).

177. The summaries of the additional DAS survey effort over the winter 2024 / 25 period and observations used to assess potential displacement impacts within 10 km of the CWP array site in relation to FIR item 7k are provided in **Appendix 10-J Parameterisation of Red-throated Diver Displacement Rates** of the **EIAR Addendum**. Further to this, information relating to the treatment of survey data in order to estimate red-throated diver abundances within the CWP array site and associated supporting habitat within a 10 km buffer and also within The Murrough SPA for each survey are presented in **Appendix 10-I Design-based Density, Abundance Estimates, and Distributional Response of the Red-throated Diver** of the **EIAR Addendum.**

178. The reassessment of operation and maintenance phase disturbance and displacement impacts to red-throated diver resulted in a conclusion of no AESI; this conclusion corresponds with that in **Section 2.5** of **Volume 5 – Assessment of Implications for Special Protected Areas - Part 1** of the NIS.

2.7.6 Item 7g - Regional Reference Populations

'The robustness of population calculations used to estimate the regional breeding season populations is important in assessing the potential effects of the proposed development. The Commission notes that the EIAR presents two methods for estimating regional breeding season populations against which impacts are assessed.

Method 1 summing the number of breeding adults in the breeding season and the number of immatures in the previous non-breeding season. Method 2 applies the ratio of adults to immature birds in the population to the number of breeding adults in the breeding season.

The Commission acknowledges that the applicant has assessed impacts against populations derived from both methods. However, it is noted that Method 2 is considered to be the more appropriate and precautionary method to apply for estimating regional breeding season populations. The applicant is requested to clearly present the values and equations used to derive the population estimates, including their sources (e.g. a list of colonies or sites included within the reference populations), to allow validation of the methodology.'

Response

179. The Applicant can confirm that the values and equations used to derive the population estimates were provided within the EIAR. The following response provides the Applicant's consideration of the value of providing two clearly defined methodologies, the specific location(s) of the values and equations requested, and the methodology adopted.

180. The Applicant notes that, with regards to the definition of regional breeding seabird populations, the Commission considers Method 2 to be more appropriate. The Applicant maintains that the approach used within **Volume 3, Chapter 10 Ornithology** of the EIAR, whereby impacts were assessed against populations derived from both Methods 1 and 2 remains a valid and sensible strategy for assessment as this provides an appropriate context and range of likely effect. As Method 2 has been used within the assessment and, as outlined by the Commission, Method 2 generally results in a more conservative basis of assessment, this conservatism is therefore incorporated within the EIAR.

181. The Applicant acknowledges the Commission's request to present the values and equations used to derive the ornithological population estimates which were used to form the basis for the assessment in **Chapter 10 Ornithology** of the EIAR and can confirm that these were provided in **Section 2.5.2** of **Volume 4, Appendix 10.5 Offshore Ornithology Baseline Characterisation Report** of the EIAR.

182. Specifically, the Commission has requested that the following parameters used to derive the population estimates are presented:

- Values;
- Equations; and
- Sources (e.g. colonies/sites included within the reference populations).

183. The approach followed to determine regional reference populations (for both Methods 1 and 2) for seabird species in the breeding season is presented within the EIAR (*ibid*).

184. **Table 2.20** of **Appendix 10.5** of the EIAR presents the values used in the determining of regional populations using Method 2 (i.e. using the number of breeding adults to estimate the number of immatures within a given seabird species population). The number of adults within each species' breeding population was defined as being the sum of the breeding population of colonies which lie

within foraging range of the Project. Foraging range is defined as the mean maximum foraging range (plus one Standard Deviation) for each seabird species as described by Woodward *et al*. (2019). **Table 2.18** of **Appendix 10.5** of the EIAR summarises the information used to define seabird foraging ranges per Woodward *et al*. (2019).

185. Furthermore, **Appendix-B** of **Appendix 10.5** of the EIAR provides a detailed breakdown on the colonies used in the defining of the regional breeding populations, including the distance to each colony from the array site, the population count date and the number of individuals recorded at each site. **Table 2.18** of **Appendix 10.5** of the EIAR directs the reader to **Appendix-B**, where the above breakdown is provided.

186. The demographic rates used in the calculation of regional breeding populations were derived from Horswill and Robinson (2015), as cited in **Appendix 10.5** of the EIAR. Specifically, the immature to adult ratio for each species was taken from this source and is presented in **Table 2.14** of **Appendix 10.5** of the EIAR. The equation used to determine the regional breeding population for each species using Method 2 is as follows:

$$Regional\ population = Breeding\ adults + (Breeding\ adults * Immature\ to\ adult\ ratio)$$

187. In presenting the above requested information within **Appendix 10.5** of the EIAR, it is considered that the request by the Commission to provide this information is fulfilled and that the signposting herein provides clarification as to the rationale and sources for the definition of the regional species populations as defined using Method 2. The conclusions of the ornithological assessment presented in the EIAR, using the populations as defined using the methods described herein, remain valid.

2.7.7 Item 7h - Manx Shearwater

The offshore ornithology baseline has primarily been informed by site specific DAS data collected over the array site plus a 4km buffer. DAS are conducted under good weather conditions in daylight hours, therefore, may underrepresent species which are more active between dusk and dawn.

The applicant is requested provide narrative on the appropriateness of the baseline surveys to characterise Manx shearwater Puffinus puffinus usage of the array site, considering its nocturnal activity. The Commission therefore requests the applicant to set out in detail and consider any data gaps and limitations, and the implications of these, in undertaking revised assessments in the EIAR and in the NIS.

Response

188. The Manx shearwater (*Puffinus puffinus*) is a medium-sized, migratory procellarid which is present within the British Isles, including Irish Sea, during the breeding season. Birds begin to arrive within UK waters from late-March with the end of their post-breeding presence occurring in early-October (Furness, 2015). Birds breeding in UK and Irish waters spend the winter months at sea off the Atlantic coast of South America (MarLIN, 2025).

189. **Volume 3, Chapter 10 Ornithology** of the EIAR and **Volume 5 - Assessment of Implications for Special Protection Areas – Part 1** of the NIS and their associated annexes and appendices include full details as to the methodologies utilised throughout the baseline period for characterising the ornithological baseline within the array site, the OECC and the intertidal landfall area. Ornithological baseline data were derived from a variety of sources, including site-specific surveys and literature-derived data.

190. One of the primary methodologies used to define the ornithological baseline within the array site (plus a 4 km buffer) was DAS. This methodology involved the collection of high-resolution aerial imagery by

an aircraft, overflying pre-defined parallel survey transects spaced at regular intervals across the site, perpendicular to the coast. **Volume 4, Appendix 10.5 Offshore Ornithology Baseline Characterisation Report** of the EIAR provides a full detailed account of the DAS methodology used in characterising the ornithological baseline.

191. The collection of aerial imagery using the DAS methodology described in **Appendix 10.5** of the EIAR requires that aerial surveys are flown during daylight hours.

192. In response to the FIR, the Applicant has undertaken a literature review, which is laid out in **Appendix H - Suitability of DAS for Characterising Manx Shearwater Activity** of this **FIR Response Document** and outlines the activity patterns of Manx shearwater throughout the diel cycle, both at-sea and within the vicinity of their coastal breeding colonies.

193. The literature review characterises Manx shearwater diurnal habits at sea using available data from tracking studies and observations, and highlights that nocturnal activity in the vicinity of breeding colonies is a predator-avoidance strategy and not reflective of this species' movement patterns whilst at-sea.

194. It is concluded that, as described in **Appendix H - Suitability of DAS for Characterising Manx Shearwater Activity,** given the abundance and distribution of Manx shearwater recorded during all times of day during the DAS survey campaign across both the characterisation and validation surveys which provide a composite of data across 2020/2021, 21/22, 24/25, and 25/26, the DAS methodology is a robust methodology to evaluate the usage of the array site plus a 2 km buffer by Manx shearwater.

195. Conclusions relating to operation and maintenance phase disturbance and displacement impacts to Manx shearwater within both the EIAR and NIS remain valid.

196. The evidence laid out above necessitates no changes to the NIS addendum in relation to FIR item 7h. This is on the basis that the assessment of any impacts on the conservation objectives, in relation to the breeding Manx shearwater features, of relevant SPAs are informed by those sites' designated population sizes. As these population sizes have not changed, the conclusions drawn as part of the NIS assessment of the site both alone and in-combination remain valid.

Impact assessment

2.7.8 Item 7i - Displacement Rates

The Commission is satisfied that the applicant has used the industry standard Displacement Matrix approach. However, the Commission notes that the applicant has based conclusions in relation to displacement on its preferred rates for displacement and mortality of auks (Common Guillemot Uria aalge, Atlantic Puffin Fratercula arctica, and Razorbill Alca torda) and Northern Gannet (50% displacement and 1% mortality for auks, 70% displacement and 1% mortality for Northern Gannet Morus bassanus) instead of on industry recommended rates, and has taken these rates forward to Population Viability Analysis (PVA). The Commission queries the applicant's use of preferred rates in relation to auks, due to CWP's close proximity to the coast and to breeding auk colonies.

The applicant is therefore requested to review the EIAR and NIS to apply rates more appropriate to the location and scale of the development, and in line with industry recommendations (60% displacement and 1-5% mortality for auks; and 70% displacement and 1-3% mortality for Northern Gannet; NatureScot, 2023), to inform assessment and enable comprehensive conclusions. Where impacts with these rates result in a >1% increase in baseline mortality rate, the mortality estimates should be taken forward to PVA.

The applicant is requested to review the displacement and mortality rates used in the EIAR and NIS for auk species (common guillemot Uria aalge, razorbill Alca torda, and Atlantic puffin Fratercula

arctica). The justification provided for using 50% displacement and 1% mortality is not considered appropriate for CWP due to its close proximity to the coast and to breeding auk colonies. Therefore, more appropriate rates (i.e. those recommended by NatureScot (60% displacement and 1-5% mortality)) should be applied. Assessment conclusions based on these recommended rates must also be presented and considered within the EIAR and NIS.

Response

197. The Applicant maintains that the approach presented within **Volume 3, Chapter 10 Ornithology** of the EIAR and **Volume 5 - Assessment of Implications for Special Protection Areas – Part 2** of the NIS regarding displacement and mortality rates for auk species and gannet in relation to offshore wind farm infrastructure remains the most appropriate in light of the best available evidence on auk displacement and continues to base assessment conclusions upon those values.

198. In relation to the estimates of the displacement and mortality rates requested by the Commission to align with NatureScot (2023) guidance, the Applicant directs the reader to the following Tables within **Volume 4, Appendix 10.4 Offshore Ornithology Displacement** of the EIAR where mortality estimates associated with alternative displacement and mortality rates are presented:

- Guillemot: Breeding season – Table 3.4 and Non-breeding season – Table 3.5;
- Razorbill: Return migration – Table 3.6; Migration-free breeding season – Table 3.7; Post-breeding migration – Table 3.8 and Migration-free winter – Table 3.7;
- Puffin: Return migration – Table 3.10; Migration-free breeding season – Table 3.11; Post-breeding migration – Table 3.12 and Migration-free winter – Table 3.13; and
- Gannet: Return migration – Table 3.1; Migration-free breeding season – Table 3.2; Post-breeding migration – Table 3.3.

199. Justification of the continued use of displacement and mortality rates of 50% and 1% respectively for auks, and 70% and 1% respectively for gannet, as a basis for assessment conclusions is detailed in the **Section 10.10.3** of **Chapter 10 Ornithology** of the EIAR, which pertains to magnitude of impact in the array site for indirect habitat loss and barrier effects to seabird species. The justification provided is also in accordance with the recognised guidance which requires that a range of displacement rates be presented (as was presented in the EIAR). As outlined, the Applicant considers the displacement and mortality rates used for assessments within the original application to be those rates which are best supported by available evidence, while also being suitably conservative to ensure that conclusions presented within the original application are beyond reasonable scientific doubt.

200. In relation to the higher displacement and mortality rates referenced in NatureScot (2023) guidance, the Applicant has considered more recent publications in peer reviewed literature. This provides further support for the Applicant's approach to base conclusions on 1% mortality rates in the original application. Specifically Furness *et al.* (2025) includes a review of uncertainty present within the approaches used to quantify displacement impacts. This review highlights uncertainty relating to the biological rationale underpinning the relationship between individuals being displaced and increases to their likelihood of experiencing mortality. This rationale is predicated upon the assumption that displaced individuals experience an energetic cost of being displaced through increased competition resulting in reduced prey availability which negatively affects their body condition. Furness *et al.* (2025) highlight that a far larger driver of mortality from competitive effects is likely to be the inherent variability of prey fish populations in response to environmental factors or fishing pressure and that the effects to prey fish availability attributable to seabird predation are likely to be very small. This demonstrates

the levels of inherent conservatism surrounding the standard assumptions made in relation to assessments of displacement mortality.

201. While guidance from NatureScot recommends that higher mortality rates than 1% are used in assessments of impacts from displacement (e.g. 3% and 5% for guillemot), they state that "*Modelled data from SeabORD suggests that mortality due to displacement may be higher than 1%. Our current advice is therefore to use higher displacement mortality rates for the matrix method in order to ensure that outputs more closely match the SeabORD outputs*.". SeabORD (Searle *et al*., 2018) is an energetics model that predicts change in adult survival rates from site specific tracking information on auks and kittiwake. These higher mortality rates recommended by NatureScot are based on modelling of seabirds from only three seabird colonies on the east coast of Scotland with connectivity to three offshore wind farms. While NatureScot have advised higher mortality values be used generally as a result of these model results this is not the recommendations of the authors of that model. The authors note that there are "important caveats" with using the estimates from their work generally, including:

- The model outputs are subject to the accuracy of model structure and parameterisation;
- Understanding of seabird behaviour and energetics is "by no means comprehensive"; and
- Full sensitivity of how model parameters (particularly those derived from expert opinion) affect outputs hasn't been completed.

202. They concluded that, "*the precise interaction of ORDs* [Offshore Renewable Development] *with the foraging and flight patterns of breeding birds at any particular location or time will inevitably vary from model predictions*". Review of the broad applicability of the outputs from seabORD to other situations than those modelled were undertaken for the Berwick Bank Offshore Wind Farm (Vallejo *et al.,* 2022). The key conclusions of that review were that,

- the sensitivity of the SeabORD model to some key parameters, including those based entirely on professional judgement, suggests that the outputs are unlikely to be more reliable than those from the matrix approach with the added disadvantage that the sources and magnitude of uncertainty are not transparent;
- Several assumptions underlying the SeabORD model are precautionary such that combined with precautionary displacement and barrier rates, impacts may be substantially over-estimated; and
- The output of the SeabORD model is extremely sensitive to the prey distribution and bird density maps underlying the algorithms thus it does not seem appropriate to reply on simplifications such as the distance-decay assumption and the assumption of uniform prey.

203. This review and the seabORD authors own statements highlights the low applicability of the higher displacement mortality rates recommended by NatureScot to areas beyond the region where the model was applied. Given that the seabird colonies of interest here are in another sea basin, the applicability of the NatureScot higher mortality rates is low and do not represent the best scientific information in the field for this assessment.

204. The use of displacement and mortality rates upon which original application assessment conclusions are based is justified through the evidence considered by Dierschke *et al.,* (2016), and MacArthur Green (2019), who determined appropriate displacement rates for Guillemot and Razorbill for Norfolk Vanguard OWF in the English Southern North Sea to be 50% from within the array site and 30% from a surrounding 1 km buffer. Additionally, Wade *et al*., (2016), showed that auk species and gannet have a moderate vulnerability to displacement from structures and vessel and helicopter traffic, however, their avoidance rates to offshore wind farms can be high.

205. Further evidence that an auk displacement rate of 50% is precautionary comes from studies that indicate auk habituation to Offshore Wind Farms (OWFs). This was demonstrated at Thanet OWF in the English southern North Sea, where auk displacement was shown to be statistically significant, but

only in the short term, with abundances increasing within the wind farm from year two post-construction suggesting some level of habituation after one year of operation (Percival, 2013).

206. Justification for the use of a mortality rate of 1% for both auks and gannet can be illustrated through evidence gathered from investigation the effects of displacement and barrier effects on breeding populations of seabirds during the chick rearing period. Searle *et al*. (2014; 2018) reported changes in time and energy budgets which could impact future survival of auks, however the simulations concluded that the displacement effects were unlikely to result in a mortality rate increase of over 0.5%. Therefore, the use of a mortality rate of 1% in this assessment is considered to be highly precautionary.

207. For the purpose of the assessment presented in **Volume 3**, **Chapter 10 Ornithology** of the EIAR and the **Volume 5 - Part 2** of the NIS, an evidence-led precautionary displacement and mortality rate of 50% and 1 % respectively for auks, and 70% and 1% respectively, for gannet was applied to each bio-season (per Furness *et al*., 2015) based on evaluation of the published literature and in line with values used by other comparable OWF displacement assessments (e.g. Berwick Bank Wind Farm, 2022; Awel y Mor, 2022).

208. A review submitted by Hornsea Four OWF (APEM, 2022) summarises all current post consent-monitoring studies undertaken to date within the UK waters and provides an extensive study and analysis of the empirical data from offshore wind farms. This review concluded that a displacement rate of 50% and mortality rate of 1% was appropriate for use in relation to displacement assessments being undertaken for the Hornsea Four offshore wind farm. The review suggests that in areas of high abundance, displacement is limited and postulates that this may be due to higher importance of the underlying habitat to birds meaning birds are more likely to tolerate the presence of structures in the area. For areas with low abundance, displacement rates were increased and the review postulates that this may be that birds are able to forage in other areas as competition between birds is reduced. Although greater than 50% displacement was observed at five developments in the study, all had very low abundance of auks within the study area.

209. Despite the Applicant's unchanged stance that the displacement and mortality rates used as a basis for assessment conclusions within the original EIAR and NIS are the most appropriate, best supported by available literature and sufficiently precautionary to ensure that conclusions presented within the original application are beyond reasonable scientific doubt, the Applicant also directs the Commission to **Appendix I Alternative Outputs Referencing NatureScot Higher Displacement and Mortality Rates** of this **FIR Response Document**. Within this Appendix alternative assessment information is presented on the basis of the use of NatureScot 2023 guidance. In relation to impacts to regional populations within an EIA context, the use of NatureScot 2023 rates would not alter assessment conclusions of the project alone and cumulatively, which would remain not significant. In relation to impacts to SPA populations within the NIS context, the use of NatureScot 2023 rates would not alter the assessment conclusions, which would remain No AESI for the project alone and in-combination with other reasonably foreseeable plans and projects.

EIAR context

210. As described above, considerations of displacement impacts to regional auk and gannet populations, as presented in **Section 10.10** of **Volume 3**, **Chapter 10 Ornithology** of the EIAR, remain unchanged and valid. With regards the other displacement rates requested, the Applicant considers there to be limited risk of a meaningful impact in the EIAR context and directs the reader to **Appendix I Alternative Outputs Referencing NatureScot Higher Displacement and Mortality Rates** of this **FIR Response Document** in which alternative outputs based upon the higher displacement and mortality rates from NatureScot 2023 guidance are presented. The information provided demonstrates that if assessment were undertaken based upon the use of such rates, project only and cumulative

impact assessment conclusions would remain unchanged and not significant in EIAR terms for all species.

211. Cumulative displacement impacts have been reassessed and are presented in **Section 10** of the **CEA Report (Part 2)**. The reassessment considers data published after submission of the planning application in September 2024, and updates made in response to other FIR items. Derivations of revised cumulative impact totals and assessment calculations are presented in the **Appendix 1 Ornithology Quantitative Tables** of the **CEA Report (Part 2)**. Cumulative displacement impacts to auk species and gannet are assessed to be not significant in EIA terms. With regards the displacement and mortality rates requested (NatureScot 2023 guidance), the Applicant conclusions would remain unchanged with no AESI for all SPAs.

NIS context

212. Within the context of the Habitats Regulations Assessment (HRA) framework, the applicant maintains that the use of displacement and mortality rates which are supported by best available scientific evidence remains the most appropriate basis upon which to undertake assessment of displacement impacts to SPAs. Specifically, as outlined in **Section 4.3** of **Volume 5 - Part 2** of the NIS, in the case of auk species (guillemot, razorbill and puffin), a displacement rate of 50% within the operational wind farm array area and a surrounding 2 km buffer and a mortality rate of 1% for displaced individuals. In the case of gannet, these rates are 70% and 1% respectively.

213. Accordingly, considerations of displacement impacts to the following SPA populations, as presented in **Volume 5 - Part 2** of the NIS remain unchanged and valid;

- Ireland's Eye SPA [Guillemot and Razorbill];
- Lambay SPA [Guillemot, Razorbill and Puffin];
- Saltee Islands SPA [Guillemot, Razorbill, Puffin and Gannet];
- Skomer, Skokholm and the Seas off Pembrokeshire SPA - Wales [Puffin];
- Grassholm SPA – Wales [Gannet];
- Ailsa Craig SPA – Scotland [Gannet];
- The Bull and The Cow Rocks SPA [Gannet]; and
- Skelligs SPA [Gannet].

214. Project-only displacement impacts to auk species and gannet are assessed to not compromise the achievement of Conservation Objective attribute targets to any SPA. Consequently, **project-only displacement impacts to these receptors are concluded not to result in AESI for any SPA.** With regards the other displacement rates requested, the Applicant considers conclusions would remain unchanged with no AESI for all SPAs.

215. In-combination displacement impacts have been reassessed to include consideration of data published after submission of the original application documents in September 2024 with consideration of changes relating to other FIR items and are summarised in **NIS Addendum (Part 3)** with the derivations of revised cumulative impact totals and assessment calculations presented in the **Appendix 1 Ornithology Quantitative Tables** of the **CEA Report (Part 2)**. **In-combination displacement impacts to auk species and gannet are concluded not to result in AESI for any SPA**. With regards the other displacement rates requested, the Applicant considers there to be limited risk of a meaningful impact in the NIS context and directs the reader to **Appendix I Alternative Outputs Referencing NatureScot Higher Displacement and Mortality Rates** of this **FIR Response Document** in which alternative outputs based upon the higher displacement and mortality rates from NatureScot 2023 guidance are presented. Importantly, if assessment were undertaken based upon the use of such rates, project only and in-combination impact assessment conclusions would remain unchanged with no AESI for all SPAs.

2.7.9 Item 7j - Black-legged Kittiwake

'The issue of Black legged Kittiwake Rissa tridactyla displacement has been set out in the EIAR, NIS, and associated appendices and supporting documents. The applicant has followed the approach taken for various English Offshore Wind Farm (OWF) projects in the North Sea, where Black legged Kittiwake has been screened out for displacement effects. However, these projects are generally much further offshore and distanced from breeding colonies, whereas the CWP array site is located more proximate (i.e. 10.5km) to the nearest Black legged Kittiwake breeding colony at Wicklow Head SPA.

The Commission notes that the species is a SCI for a number of SPAs within foraging range of the array site. Black legged Kittiwake has variable responses to OWFs, ranging from up to 45% displacement effects to mild attraction effects, varying at different latitudes, distances from colonies, and seasons (e.g., Peschko et al., 2020; Pollock et al., 2024). Having reviewed the information presented, the Commission disagrees with the screening out of Black legged Kittiwake for displacement for reasons related to the proximity of the proposed development to the coast and to breeding colonies.

The applicant is requested to use the Displacement Matrix approach, as has been done for other species. Here, a 30% displacement rate should be applied, and mortality rates should be based on the best available evidence, but with a range of rates presented, from 1% to 3%, as advised by NatureScot (2023). The applicant, based on the revised findings, is requested to re-analyse the displacement impacts on the regional population of Black legged Kittiwake in the EIAR and against the Conservation Objectives of the relevant SPAs in the NIS to ensure comprehensiveness of its Appropriate Assessment conclusions.'

Response

216. The Applicant maintains that the approach presented within **Volume 3**, **Chapter 10 Ornithology** of the EIAR and **Volume 3 – Screening** of the NIS to screen out displacement impacts for kittiwake in relation to OWF infrastructure remains the most appropriate. This is considered to be the case through reference to the best available evidence on kittiwake distributional responses, and aligns with the approach advocated by other regional Statutory Nature Conservation Bodies (SNCBs); whilst this latter aspect is not a primary driver it is relevant insofar as consistency for cumulative, in-combination, and transboundary assessment.

217. Both Natural England (NE) and Natural Resources Wales (NRW) advocate the screening out of displacement impacts to kittiwake in accordance with the Joint [UK] SNCB Interim Displacement Advice note (first published in 2017, and most recently updated in 2022), on the basis that the species' sensitivity to disturbance is below the threshold for inclusion in displacement assessments. Consequently, this screening approach is consistent with that followed for most consented and operational OWFs within the Irish Sea, as these occur within waters under the jurisdictions of NE or NRW.

218. The outcomes of individual studies to evidence spatial responses by kittiwake to OWF infrastructure, which are primarily based upon comparisons of densities before and after construction, are variable (Vanermen and Stienen 2019). When considered collectively these studies indicate that, where they are potentially noted, the attribution of apparent distributional responses to the presence of offshore infrastructure is illogical given the naturally high variability of kittiwake numbers between years at the scale of OWF array areas. This is consistent with the findings of a joint industry research project in the UK funded by ORJIP ('Improving understanding of distributional change for relevant seabird species' ImpUDis; Searle *et al.*, 2023) which has analysed before-after datasets for nine UK OWFs and identified no evidence that kittiwakes are displaced by OWF infrastructure.

219. Evidence indicating non-displacement of kittiwake is also available in relation to the existing Arklow Bank Phase 1 OWF in close vicinity to the CWP Project. Digital aerial surveys overflying this site were conducted on a monthly basis over a two-year period to inform the baseline characterisation for the proposed Arklow Bank Phase 2 OWF and showed no indication of kittiwake avoiding the existing seven WTGs or surrounding areas (Figure 12.8.15 – Arklow Bank Phase 2 EIAR Appendix: 12.8). If 30% of kittiwakes were being displaced within 2km of these WTGs, as would be the prediction following the NatureScot guidance, this would be evident as fewer observations would be recorded near the existing WTGs. There is no evidence that this has occurred at Arklow Bank, and some of the highest densities were in fact recorded in the area immediately around the existing WTGs.

220. Recent precedence for similarly sized OWFs is in line with this approach to screening, e.g. the Awel-y-Mor OWF (Wales; Application submitted 2023; consent granted 2024) for which the array is located approximately 11 km from similarly sized kittiwake colonies on the Orme headland (total 2,356 breeding adults in 2019 referenced in application; Awel-y-Mor, 2022) and for which displacement impacts to kittiwake were screened out on the basis of available scientific evidence. Again, whilst this regional precedence is considered relevant, it is primarily relevant as it informs the cumulative, in-combination and transboundary assessment; it is not considered appropriate to present assessment outcomes which contradict those of consented and/or built projects and rely on a potentially flawed use of data.

221. Notwithstanding this robust position with regards it being inappropriate to assess displacement impacts to kittiwake the Applicant has sought to address the Commission's request and presents a revised screening approach in relation to displacement impacts to kittiwake within the **EIAR Addendum** and **NIS Addendum**.

EIAR context

222. To do this, within the context of the EIA framework, the Applicant has updated impact screening text and then evaluated the sensitivity of kittiwake to displacement impacts and the magnitude of those impacts for the project alone. Impact magnitude calculations have used the matrix approach and followed displacement and mortality rates recommended by NatureScot (2023). Using these criteria the Applicant has attributed a project-only impact significance rating accompanied by an overall conclusion relating to the significance of the impact in EIA terms.

223. These changes are outlined within **Section 10.10** of the **EIAR Addendum (Part 1)** supported by **Appendix 10-H Kittiwake Displacement Matrices** of the **EIAR Addendum**.

224. For project-only effects kittiwake is assessed to have medium sensitivity to disturbance and displacement impacts. Using the displacement matrix approach to estimate displacement mortality from mean-peak seasonal abundance and assuming a displacement rate of 30% and associated mortality rates of 1 % and 3% (as per NatureScot 2023 guidance), the magnitude of project-only displacement impacts to kittiwake are assessed to be negligible. On this basis the significance of project-only disturbance and displacement impacts are assessed to be imperceptible and not significant in EIA terms.

225. In accordance with the criteria outlined within the **CEA Report**, and as demonstrated in **Appendix I Alternative Outputs Referencing NatureScot Higher Displacement and Mortality Rates** of this **FIR Response Document**, Project only impacts assessed as being of imperceptible significance do not meet the criteria for inclusion within cumulative impact assessment.

NIS context

226. Within the context of the HRA framework, the Applicant has updated the Stage 1 Screening of the NIS such that there is a potential pathway of impact for displacement around operational WTG infrastructure to SPAs designated in relation to their breeding kittiwake populations. These changes are outlined within **NIS Addendum (Part 1)**.

227. As the potential for displacement impacts to result in Likely Significant Effect (LSE) cannot be excluded in Stage 1 Screening of the revised NIS, these impacts are consequently assessed in relation to its potential to result in AESI to these SPAs by considering the likelihood that such impacts may compromise the achievement of Conservation Objective attribute targets. These changes are outlined within **NIS Addendum (Part 1)**.

228. Where quantitative methods have been used to assess the potential for AESI, i.e. specifically in relation to Conservation Objective attributes regarding the maintenance or restoration of the designated kittiwake features conservation condition via effects upon breeding population size, the following total displacement mortalities (assuming 30% displacement and a precautionary 1% associated mortality) were apportioned to SPAs designated in relation to their breeding kittiwake populations in accordance with the approach used within the original NIS.

- Wicklow Head SPA – 0.221 breeding adults per annum;
- Howth Head Coast SPA – 0.143 breeding adults per annum;
- Ireland's Eye SPA – 0.032 breeding adults per annum;
- Lambay Island SPA – 0.207 breeding adults per annum;
- Saltee Islands SPA – 0.020 breeding adults per annum;
- Helvick Head to Ballyquin SPA – 0.001 breeding adults per annum;
- Ailsa Craig SPA – 0.008 breeding adults per annum;
- Rathlin Island SPA – 0.209 breeding adults per annum; and
- Old Head of Kinsale SPA – 0.011 breeding adults per annum.

229. With regard to the consequences of these displacement impacts upon the breeding population sizes of these SPAs, they are estimated to result in the following proportional increases to annual baseline mortality rates, respectively:

- Wicklow Head SPA – 0.117%;
- Howth Head Coast SPA – 0.028%;
- Ireland's Eye SPA – 0.027%;
- Lambay Island SPA – 0.021%;
- Saltee Islands SPA – 0.007%;
- Helvick Head to Ballyquin SPA – 0.006%;
- Ailsa Craig SPA - 0.005%;
- Rathlin Island SPA -0.005%; and
- Old Head of Kinsale SPA – 0.005%.

230. Additional mortality associated with potential displacement impacts to the kittiwake SCIs of these SPAs is estimated to represent only very small potential increases (much less than 1%) to baseline SPA mortality rates. Such impacts are not considered to impede Conservation Objective attributes relating to the maintenance or restoration of breeding kittiwake population targets. Consequently, it can be concluded beyond reasonable scientific doubt that displacement impacts or to breeding kittiwake from the CWP Project will not result in AESI for these SPAs.

231. Marine Area SPAs (North Irish Sea Area SPA and Seas Off Wexford SPA) do not overlap with the area around the CWP array site in which kittiwake may potentially experience displacement impacts.

Impacts to kittiwake which utilise these marine areas during the breeding season are addressed through consideration of AESI potential for designated kittiwake breeding colonies associated with each Marine Area SPA. Consequently, **displacement impacts to breeding kittiwake from the CWP Project will not result in AESI for these SPAs**.

232. It is not possible at the time of submission of further information to undertake an adequately informed quantitative assessment of in-combination displacement impacts to the kittiwake SCIs of these SPAs. This is on account on a lack of published information relating to the estimated displacement impacts to kittiwake from these SPAs by other Phase 1 projects, and uncertainty as to how displacement assessment will be undertaken for those projects. Although non-Phase 1 projects, which are relatively distant to the majority of key Irish east coast kittiwake SPAs in comparison to Phase 1 projects, may apportion small proportions of predicted kittiwake displacement impacts to Irish east coast SPAs, the inability to include other Phase 1 projects in in-combination assessment, from which the large majority of total in-combination impacts are likely to come from, prevents a quantitative assessment.

233. In-combination displacement impacts to kittiwake have therefore not been included within **NIS Addendum (Part 3)**. Despite this, any displacement impacts to this species, if they do occur, are likely to be difficult to differentiate from natural spatial and temporal population variation. As such population consequences are likely to be much smaller than the predicted collision impact effects that are included within the in-combination assessment. As the in-combination collision impacts are assessed not to result in AESI to any SPA, it follows that in-combination displacement impacts will also not result in AESI to any SPA, particularly when it is considered that collision and displacement impacts would not act additively (as bird which are displaced by from the areas around WTGs do not experience any risk of collision with those WTGs).

Collision risk

2.7.10 Item 7l - Model Parameters

'The Commission notes that a 0m tidal offset (the difference between Mean Sea Level (MSL) and Highest Astronomical Tide (HAT)) has been applied in collision modelling for all scenarios, which is standard practice for floating OWF projects. As CWP employs fixed bottom foundations, an appropriate tidal offset should be applied. The applicant is requested to provide justification for using a 0m offset or to update the model and obtain new collision estimates.

A combination of site-specific and generic flight height distribution (FHD) data has been used in collision modelling, with site-specific data informing assessment conclusions where available. The Commission therefore requests that the applicant uses generic FHD data to inform assessment conclusions with site specific data presented and discussed for additional context where relevant.'

Response

Tidal offset clarification

234. The following clarification is provided in relation to the Commission's request for justification of the use of a 0 m tidal offset value for collision risk modelling undertaken within the original application.

235. A tidal offset is often included in collision risk models, to standardise the chart datum (i.e., mean sea level, lowest astronomical tide, or highest astronomical tide) that measurements are taken from. Characteristics of offshore developments, such as the air gap between sea level and the lowest rotor swept heights of WTG blades, are often provided by project engineers at highest or lowest astronomical tide; while flight heights of birds are estimated across tidal cycles and are assumed to be

representative of flight heights relative to mean sea level (Camphuysen *et al.*, 2004). When a tidal offset is used, the offset value is added to the air gap, so that the chart datum aligns with mean sea level and is comparable with the flight height data. The measurement of air gap for CWP was available relative to mean sea level, and therefore no tidal offset was required.

Justification of site-specific flight height distributions within collision impact assessment

236. In relation to the Commission's request that generic flight height distribution data (i.e. from Johnston et al., 2014) is used to inform assessment conclusions instead of site-specific flight height distribution data for species where the latter approach was used within the original application (kittiwake, gannet and herring gull), the Applicant maintains that the approach presented within **Volume 3, Chapter 10 Ornithology** of the EIAR and **Volume 5 - Assessment of Implications for Special Protection Areas** of the NIS, is appropriate.

237. A detailed justification for why the site-specific flight height distributions used in the Band Option 1 Collision Risk Assessment is robust and more appropriate than use of generic flight height distribution is available in **Section 10.10.3** of EIAR **Volume 3, Chapter 10 Ornithology** and **Volume 4, Appendix 10.3 Collision Risk Modelling**. Further justification is provided in **Appendix J - Site-specific Flight Height Distribution Data for Collision Risk Modelling** and supported by additional ESAS data for June and July 2025 (see **Table 2**) which is reported in **Appendix 10-C ESAS Survey Report 2025** of this **FIR Response Document**. The following provides a brief summary of this justification.

238. Site-specific flight height datasets collected by the CWP Project during baseline ESAS surveys are considered suitable to facilitate the generation of site-specific flight height distributions for kittiwake, gannet and herring gull. For these species, sample sizes exceeded the recommended criteria for the production of robust flight height distributions (see **Section 2.1** of **Volume 4, Appendix 10.3 Collision Risk Modelling** of the EIAR). Flight height estimation accuracy and precision equalled or exceeded levels used to create generic flight height distributions and the goodness of fit values of curves fitted to flight height distribution data were high.

239. Of the 32 sites from which flight height data was collected to inform the creation of generic flight height distributions (Johnston *et al.*, 2014), none are situated within Irish waters, and the majority (24 sites) were located within the North Sea. As such, where a suitably robust option exists to use site-specific flight height distribution data to inform collision impact assessment (instead of generic flight height data collected outside of Irish waters and mostly from a different sea region), the Applicant considers that this option provides a more robust basis upon which to undertake collision impact assessment than using generic flight height distributions. Furthermore, it represents an approach based on the best available evidence. In brief, the Applicant has sought to use the most appropriate data, through consideration of a data hierarchy. As such site-specific flight height distribution data are considered the most optimal in informing assessments. Where sufficient site-specific flight height distribution data do not exist, due to not meeting the above criteria for example, generic flight height distribution data remain appropriate. Similarly, where generic flight height distribution data are not available appropriate proxies and/or conservative assumptions are employed.

240. This is further supported by observations that flight height distributions vary spatially in relation to factors such as which flight behaviours are undertaken within areas (e.g. commuting vs foraging - Cleasby *et al.,* 2015), or differences in the prevailing weather conditions between areas (e.g. wind speeds - Davies *et al.,* 2024). Collision risk models using generic flight height distributions do not incorporate consideration of these behavioural and environmental factors which may affect flight height distributions at a site-specific scale.

241. Accordingly, these findings constitute no material change to the existing assessment, as the same hierarchical approach to flight height data has been applied within the EIAR. As described in **Volume 4, Appendix 10.3** of the EIAR, the Applicant's collision risk modelling employs site-specific flight height

information, and uses generic flight height distributions (e.g., Johnston *et al.* 2014) only where site-specific data are unavailable. The approach described herein is therefore consistent with the methodology and conclusions presented in the original EIAR. These findings constitute no change to the existing assessment and the conclusions of the EIAR remain valid.

242. Cumulative collision impacts have been reassessed to include consideration of data published after submission of the original application documents in September 2024 with consideration of changes relating to other FIR items and are summarised in **Section 10** of the **CEA Report (Part 2).** Derivations of revised cumulative impact totals and assessment calculations presented in the **Appendix 1 Ornithology Quantitative Tables** of the **CEA Report (Part 2)**. Cumulative collision impacts to kittiwake, herring gull and gannet are assessed to be not significant in EIA terms.

NIS context

243. Within the context of the HRA framework, the applicant maintains that the use of site-specific flight height distributions to inform assessment of predicted collision risk, where those datasets are sufficiently robust to do so (as described above), constitute the best scientific knowledge in the field and is the most appropriate basis upon which to undertake assessment of collision impacts to SPAs. Specifically, in the case of kittiwake, herring gull and gannet, sufficient, robust, data exist for collision impact estimates to breeding adults from SPA colonies to be derived using Band Option 1 CRM outputs. As such, site specific FHD and the associated Band Option 1 outputs, are the most appropriate to use when assessing the potential for AESI to SPAs designated in relation to the SCIs.

244. Accordingly, considerations of predicted collision impacts to the following SPA populations, where Band Option 1 CRM formed the basis of the assessment of collision risk within **Volume 5 – Assessment of Implications for Special Protection Areas** of the NIS, remain unchanged and valid.

- Wicklow Head SPA [Kittiwake];
- Howth Head Coast [Kittiwake];
- Ireland's Eye SPA [Kittiwake and Herring gull];
- Lambay SPA [Kittiwake and Herring gull];
- Skerries Islands SPA [Herring gull];
- Saltee Islands SPA [Kittiwake and Gannet];
- Helvick Head to Ballyquin SPA [Kittiwake];
- Skomer, Skokholm and the Seas off Pembrokeshire SPA - Wales [Puffin];
- Grassholm SPA – Wales [Gannet];
- Ailsa Craig SPA – Scotland [Kittiwake and Gannet];
- Rathlin Island SPA [Kittiwake];
- Old Head of Kinsale SPA [Kittiwake];
- The Bull and The Cow Rocks SPA [Gannet]; and
- Skelligs SPA [Gannet].

245. Project-only collision impacts to kittiwake, herring gull and gannet are assessed to not compromise achieving the Conservation Objective attribute targets to any SPA. Consequently, **project-only collision impacts to these receptors are concluded to result in no AESI for any SPA.**

246. In-combination collision impacts have been reassessed to include consideration of data published after submission of the original application documents in September 2024 with consideration of changes relating to other FIR items. The assessment is provided in **NIS Addendum (Part 3)** with the derivations of revised cumulative impact totals and assessment calculations presented in **Appendix 1 Ornithology Quantitative Tables** of the **CEA Report (Part 2)**. In-combination collision impacts to these receptors are concluded not to result in AESI for any SPA.

2.7.11 Item 7m - Northern Gannet

'The Commission notes the flying bird densities used for Northern Gannet Morus bassanus collision risk modelling (CRM) have been reduced by 70% to account for macro-avoidance of the array site, with the collision estimates from these values taken forward to the assessment. This approach has been used in English projects, and is advised by Natural England (JNCC et al., 2024; Parker et al., 2025). However, projects where this approach has been accepted (e.g., Hornsea Four) are located much further from the coast and breeding Northern Gannet colonies than CWP.

NatureScot (2025) advice is that Northern Gannet input densities are not reduced during the breeding season but, with justification, may be reduced by 70% during the non-breeding season. The applicant is requested to apply this approach when assessing collision risk to Northern Gannet, as CWP is more akin to Scottish OWFs than English OWFs having regard to its distance from the coast and the nearest breeding colony. The applicant may also present and discuss the reduced collision estimates for additional context.'

Response

EIAR context

247. The Applicant acknowledges the Commission's request to provide an assessment of collision for Northern gannet using NatureScot (2025) guidance, which advises the application of a 70% macro-avoidance correction during non-breeding seasons only (i.e. macro-avoidance corrections are not-applied during the breeding season). The Applicant also notes that NatureScot agree with the conclusions within the Application phase NIS that there would not be an AESI on gannet as a result of CWP.

248. The Applicant remains of the opinion that the incorporation of an evidence-based 70% macro-avoidance rate for gannet during all seasons represents the most appropriate approach to the quantification of collision risk for this species, as it follows the best scientific information in the field (i.e. Pavat *et al*., 2023).

249. 'Macro-avoidance' is a term used to describe the behaviour of flying birds and is defined as when 'birds avoid entering the wind farm at all (Searle *et al*., 2022)' and is broadly analogous with displacement effects to flying birds. 'Avoidance' is also a term used in collision risk modelling which is enumerated into 'Avoidance Rates', which are adjustment values representing the proportion of birds expected to avoid collision with WTG blades by taking evasive action, used to adjust theoretical 'no-action' mortality estimates to levels which incorporate more biologically realistic behaviours into the final collision mortality estimate.

250. Importantly, the avoidance rate used for gannet in the collision impact assessment in **Volume 3**, **Chapter 10 Ornithology** of the EIAR (0.993 ± 0.0003; from NatureScot, 2025 and JNCC, 2024) does not include consideration of macro-avoidance (Pavat *et al.*, 2023). Therefore, a 70% macro-avoidance correction was added across all seasons within the impact assessment in **Volume 3**, **Chapter 10 Ornithology** of the EIAR.

251. By not applying a macro-avoidance correction during the breeding season (to follow NatureScot 2025 guidance) individuals would be estimated to simultaneously experience risk of displacement and risk of collision impacts. These two outcomes are mutually exclusive as, an individual that is displaced from a wind farm (i.e. displays macro-avoidance), cannot simultaneously pass through the airspace in

which it may experience a risk of collision with operational WTG blades. The combination of collision and displacement impacts to the same individuals is therefore a precautionary assumption.

252. Despite the above outlined explanation as to why the use of NatureScot 2025 guidance would be unnecessarily precautionary, the Applicant has carried out the re-assessment of collision impacts as requested by the Commission. The gannet collision impact magnitude sections within **Section 10.10** of the **EIAR Addendum (Part 1)** have been updated to account for this change by removing the 70% macro-avoidance correction during the breeding season only. The resulting collision estimates are presented therein, alongside the annual collision mortality estimates for the blanket application and non-application of the 70% macro-avoidance correction for context. **Section 10.10** of the **EIAR Addendum (Part 1)** provides project-only annual collision estimates for the relevant macro-avoidance scenarios.

253. With this change, the impact magnitude does not change in the EIAR (impact magnitude was originally concluded as being negligible and remains such in the **EIAR Addendum**). It is also noted that no change has been made to the receptor sensitivity. As such, the impact significance for project-alone collision mortality to gannet remains not significant.

254. Cumulative collision impacts have been reassessed to include consideration of revised collision values and data published after submission of the original application documents in September 2024 with consideration of changes relating to other FIR items and are summarised in **Section 10** of the **CEA Report (Part 2)** with the derivations of revised cumulative impact totals and assessment calculations presented in the **Appendix 1 Ornithology Quantitative Tables** of the **CEA Report (Part 2)**. Cumulative collision impacts to gannet are assessed to be not significant in EIA terms.

NIS context

255. In the NIS, collision impacts upon gannet were apportioned to the following SPAs:

- Saltee Islands SPA;
- Grassholm SPA;
- Ailsa Craig SPA;
- The Bull and the Cow Rocks SPA;
- Skelligs SPA; and
- Seas off Wexford SPA.

256. Updated apportioned collision impacts based on a 70% macro-avoidance rate during the non-breeding seasons only (return migration and post-breeding) are provided for Saltee Islands SPA, Grassholm SPA, Ailsa Craig SPA, The Bull and the Cow Rocks SPA, Skelligs SPA and Seas off Wexford SPA in **NIS Addendum (Part 1)**. These impact values are presented alongside the annual application and non-application of the macro-avoidance correction for context.

257. Project-only predicted collision impacts to gannet would not compromise the Conservation Objective attribute targets to any of the above SPAs. Consequently, project-only displacement impacts to this receptor are concluded to result in no AESI for any SPA.

258. In-combination collision impacts have been reassessed to include consideration of data published after submission of the original application documents in September 2024 with consideration of changes relating to other FIR items and are summarised in **NIS Addendum (Part 3)** with the derivations of revised cumulative impact totals and assessment calculations presented in **Appendix 1 Ornithology**

Quantitative Tables of the **CEA Report (Part 2)**. In-combination collision impacts to this receptor are concluded to result in no AESI for any SPA.

2.7.12 Item 7n - Proxy Species

'When screening for seabird collision risks in the EIAR (Table 10-115) Black throated Diver Gavia arctica has been used as a proxy for Red-throated Diver, European Shag Gulosus aristotelis has been used as a proxy for Great Cormorant. Both of these species are included in the sources cited in the table headers. Additionally, Furness et al. (2013) and Bradbury et al. (2014) present sensitivities for a wide range of seabird species.

The applicant is requested to consider species-specific sensitivities within their assessments where available and must provide appropriate and clear justification if proxy species or data are used.'

Response

259. **Volume 3, Chapter 10 Ornithology** of the EIAR provides an assessment of collision risk to seabirds in relation to the CWP Project array site. In order to determine which species to include within the collision assessment (i.e. which species are present and sensitive to this impact), a screening exercise was carried out.

260. **Table 10-115** in **Section 10.10.3** of **Chapter 10 Ornithology** of the EIAR provides a summary of each species' risk of collision, which comprises a literature-derived sensitivity score and percentage of flight activity at potential collision height (PCH) (i.e. above 36 m mean sea level (m.s.l)) using data from Johnston *et al*., 2014).

261. The Commission notes in FIR 7n (Proxy species) that for two species, namely red-throated diver and cormorant (*Phalacrocorax carbo*), proxy species have been used: black-throated diver *Gavia arctica* for red-throated diver and shag *Gulosus aristotelis* for cormorant, despite there being species-specific parameters available.

262. The Applicant acknowledges that the above-outlined proxy species were used and the collision risk assessment has been updated accordingly. The updated assessment can be found in **Section 10.10.3** of the **EIAR Addendum (Part 1)**.

263. For red-throated diver, the species-specific sensitivity score for collision is "moderate" (Bradbury *et al*., 2014) and the proportion of flight activity at PCH (i.e. above 36 m m.s.l) is 0.62% (using data from Johnston *et al*., 2014).

264. For cormorant, the species-specific sensitivity score for collision is "low" (Bradbury *et al*., 2014) and the proportion of flight activity at potential collision height (above 36m m.s.l) is 0.07% (using data from Johnston *et al*., 2014).

265. In light of the species-specific collision sensitivity parameters provided in the updated assessment, it is concluded that, despite the use of proxy species for red-throated diver and cormorant in the original EIAR assessment, the screening-out of both species from a full collision risk modelling assessment remains accurate, and both species remain screened out of the collision modelling.

Other impacts

2.7.13 Item 7o - Artificial Light Emissions

'Manx Shearwater Puffinus puffinus is identified as a high importance receptor in the EIAR, with a maximum bio-season mean peak density of 4.9 birds/km² in the array site plus 2 km buffer. Displacement effects (where 50% displacement and 1% mortality rates are applied) have been assessed in the EIAR, however, the effects of artificial light emissions are not assessed. There is evidence to suggest that Manx Shearwater is sensitive to artificial light emissions (Guilford et al., 2018; Syposz et al., 2018; Syposz et al., 2021; Deakin et al., 2022), with studies showing increased collision with objects or grounding.

The applicant is requested to assess the effects of artificial light emissions associated with CWP on Manx shearwater in the EIAR and, where applicable, in the NIS. The Commission acknowledges that effects may be difficult to quantify in terms of changes to collision risk or displacement effects, however, a qualitative assessment and consideration of effects is required.'

Response

266. The Applicant acknowledges the Commission's request to assess the effects of artificial lighting impacts upon Manx shearwater.

EIAR context

267. A qualitative assessment on the impacts of artificial lighting upon Manx shearwater has been carried out and is provided as Impact 2a in **Section 10.10** of the **EIAR Addendum (Part 1)**. This section provides an examination as to the significance of any effects arising as a result of artificial lighting associated with CWP and associated anthropogenic activities in an EIAR context.

268. For the project-alone assessment, the impact magnitude for artificial light impacts upon Manx shearwater was assessed as negligible. In accordance with the receptor sensitivity being assessed as medium, the impact significance was assessed as being imperceptible and therefore not significant in EIA terms.

269. With regards to the CEA, only potential impacts assessed as being "not significant" or above are included. The impact of artificial lighting upon Manx shearwater within the marine environment is assessed as being "imperceptible". As such, this impact is not taken forward to the CEA, as there is no potential for an imperceptible impact to contribute to a significant cumulative effect.

NIS context

270. Artificial lighting impacts have been considered with regards to the Manx shearwater SCIs of those SPAs which were screened-in during Stage 1 of the NIS assessment. **NIS Addendum (Part 1)** concludes no AESI in relation to this impact, on the basis of a qualitative assessment.

271. In-combination impacts are presented in the **NIS Addendum (Part 3)**. In-combination artificial lighting impacts to Manx shearwater are concluded not to result in AESI for any SPA.

2.7.14 Item 7p - Onshore Substation

'The Commission notes that increased predation risk to breeding Common Tern Sterna hirundo and Arctic Tern S. paradisaea associated with the presence of the onshore substation is assessed in the EIAR and mitigation is proposed. The mitigation measures include design considerations to reduce the ability of predators to perch on top of the structure. This mitigation is welcomed by the Commission.

However, it is important that the perceived threat of predation (e.g., by reducing visibility to see predators) is also considered in the assessment. Terns primarily make use of the CDL Dolphin at present, which is considered to be due to the 360° visibility offered. The applicant is requested to assess the effects of the perceived threat of predation (i.e., reduced sight lines and visibility) to terns using the CDL Dolphin and amend the relevant assessments within the EIAR and NIS accordingly. It is acknowledged that the CDL dolphin is outside the boundary of the SPA, however, individuals using this dolphin are considered part of the SPA population and counted under the same Seabird Monitoring Programme (SMP) site. Loss of this habitat may result in increased pressure on alternative areas within the SPA.'

Response

272. The Applicant acknowledges the Commission's request to assess the effect of the perceived threat of predation to terns using the CDL Dolphin. The assessment is detailed in **Section 10.10** of the **EIAR Addendum (Part 1)** and summarised below.

273. **Section 10** of the **EIAR Addendum (Part 1)** considers the threat of predation for arctic terns on the CDL Dolphin in terms of the potential for reduced sight lines and visibility.

274. During the operational and maintenance phase, existing views from the CDL Dolphin will be maintained from all boundaries and the onshore substation will be set back c. 25-30 m from the Dolphin. In this regard, the existing visibility of predators from the water's edge on all boundaries of the Dolphin will not be impacted, with expanses of open water within the wider port environment.

275. **Figure 10-a** and **Figure 10-b** of the **EIAR Addendum (Part 1)** show the onshore substation with east and west views during the operations and maintenance (O&M) phase, demonstrating that existing visibility is not impacted and the expanse of water surrounding the Dolphin.

276. **Section 10.10** of the **EIAR Addendum (Part 1)** also recognises that terns are existing within an already developed environment with a wide range of shipping and industrial infrastructure in close proximity. This is outlined in EIAR **Volume 4**, **Appendix 10.9 Investigation of disturbance tolerance of terns breeding near to the onshore substation site**. Whilst the primary aim of this study was to investigate the level of tolerance of breeding terns to forms of disturbance, it also describes how the background environment for the CDL Dolphin, is a built environment with industrial facilities, waterborne and port infrastructure in close proximity.

277. **Section 10.10** also references other tern colonies that successfully coexist with built or industrial environments, such as the Port of Edinburgh and the Farne Islands. This demonstrates that with appropriate mitigation and site management, terns will co-exist within these dynamic environments**.**

278. The design of the onshore substation is considered appropriate for the site, where in terms of the perceived risk of predation, the existing visibility is maintained on the boundaries of the CDL Dolphin for the arctic tern colony. Additionally, the design of the onshore substation has incorporated prey deterrents and its location south of the Dolphin, could potentially reduce the ability for ambush predators to impact the Dolphin.

279. The assessment concluded that there would be no significant effects on the terns at the CDL Dolphin, as a result of the presence of buildings and infrastructure.

2.7.15 Item 7q - Intertidal Birds

'The applicant has discussed the proportion of the regional populations of intertidal birds observed in surveys, and has estimated the number of birds which may be affected by disturbance. However, the number of birds potentially disturbed has not been linked back to the regional populations.

The applicant is requested to present information on the proportion of populations which may be affected and to consider whether this could result in a significant disturbance effect. This should be applied to both the EIAR, where regional populations are considered, and the NIS, where classified SPA populations are considered.

If a significant proportion of the population is predicted to be affected, appropriate mitigation must be implemented to reduce impacts to an acceptable level. The assessment must be based on best available evidence and conclusions justified.'

Response

280. The Applicant acknowledges the Commission's request to carry out an assessment of the impact to the regional populations of intertidal waterbirds in both an EIAR and NIS context. Assessment of the proportion of populations which may be affected has been carried out by the Applicant as described below.

EIAR Context

281. **Section 10.10.2** of the **EIAR Addendum (Part 1)** report describes the assessment of construction phase disturbance impacts to the regional populations of intertidal waterbirds and refers the reader to **Appendix 10-G Regional Population Assessment** of the **EIAR Addendum**. This appendix provides an assessment of construction phase acoustic and visual disturbance impacts arising from the intertidal landfall works, with proportions of the regional population for each species, as requested by the Commission.

282. It is noted that this assessment is considered to be a worst-case scenario, as mitigation will be implemented to restrict construction works within the vicinity of the cable landfall during the months of September to mid-April, inclusive, in order to reduce any impacts to intertidal waterbird species within South Dublin Bay. This mitigation was presented within the application, however the duration of the mitigation is a matter of clarification within this FIR response (See **Section 5.5.2** of the **Observations Response Document**).

283. Nevertheless, the EIAR-context assessment outlined in **Appendix 10-G** of the **EIAR Addendum**

results in a conclusion of no significant effects after mitigation, on the basis of the proportions of the regional population. It is noted that **Appendix 10-G** only pertains to regional populations of intertidal waterbirds, as the NIS assessment has been carried out against the relevant NIS designated populations. The original conclusions of **Volume 3, Chapter 10 Ornithology** of the EIAR remain valid.

284. The Applicant notes in **Section 5.5.2** of the **Observations Response Document** that the extended seasonal restriction proposed by the NPWS in the intertidal zone (September to mid-April (inclusive)) is acceptable. Additional temporal mitigation in the form of seasonal restrictions on construction works in the intertidal zone during periods of dusk and dawn are proposed in the EIAR in order to mitigate for any impacts to intertidal waterbirds within an EIAR context (See **Section 7.1** of the **Observations Response Document** for further information).

NIS Context

285. Within the NIS, predicted impacts to the intertidal waterbird SCIs of South Dublin Bay and River Tolka Estuary SPA are assessed against the designated SPA population sizes. Any assessment of impacts to SCI species at a regional population level is not part of the NIS process, as this is not relevant to achieving and/or maintaining the site-specific Conservation Objectives.

286. Given that the application of the additional 2 weeks of seasonal restriction mitigation proposed within the EIAR reduces construction phase disturbance impacts to intertidal waterbirds to effectively zero, Stage 2 of the NIS process can therefore conclude there will be no adverse effect on site integrity as any potential impacts will be mitigated. The conclusion of the original NIS assessment therefore remains valid. Within the NIS, predicted impacts to the intertidal waterbird SCIs of South Dublin Bay and River Tolka Estuary SPA are assessed against the designated SPA population sizes.

Population Viability Analysis

2.7.16 Item 7r - Population Viability Analysis Threshold

'The Commission notes that the population-level effects have been investigated through Population Viability Analysis (PVA) where project-related impacts result in a >1% increase in baseline mortalities. For the NIS, this has been compared against the relevant season population, however, for the EIAR, only the annual population is considered.

Table 10-119 in Chapter 10 of the EIAR presents the CRM results for Great Black-backed Gull Larus marinus and compares the estimated mortalities with the reference populations. When compared against the breeding population calculated via Method 2 (item 7(g) above refers), the increase in baseline mortality is 1.886%, which exceeds the 1% threshold for PVA.

The Commission therefore requests the applicant to review estimated mortalities and increases in baseline mortality for all species, and to run PVAs to assess population-level effects where project-related impacts represent a >1% increase in baseline mortalities in any single season, annually, or SPA population. The EIAR and, where relevant, the NIS must be updated accordingly.'

Response

287. The Applicant acknowledges the Commission's request to review estimated mortalities and increases in baseline mortality for all species, and to run PVAs where impacts represent a >1% increase in baseline mortality within any season or annually. Accordingly, reviews of estimated increases to

regional mortality rates for operational phase displacement and collision impacts to check for the requirement for additional project-only PVAs to inform impact magnitude conclusions are provided in **Appendix K Project-Only PVA Requirement Review** of this **FIR Response Document**, and carried through to the **EIAR Addendum (Part 1)**.

288. This review considered operational phase impacts which have been quantitatively assessed (displacement, and collision), for each species screened in for assessment for each respective impact. Breeding season impacts were considered in relation to regional populations derived using Method 2 following the Commission's statement in relation to FIR Item 7g.

289. The conclusion of this review is that estimated mortalities do not represent a potential >1% increase in baseline mortalities in any single season or annually in any instance except that noted by the Commission in relation to collision impacts to great black-backed gull (*Larus marinus*) during the breeding season (where the breeding season regional population is calculated using Method 2).

290. Accordingly, the Applicant has sought to address the Commission's request by undertaking a PVA to assess population level consequences from the proportional impact from project-only collision estimates to the Method 2 breeding season regional great black-backed gull population. Details of input parameters for this PVA are provided within **Appendix 10-L Great Black-backed Gull Population Viability Analysis Parameter Log** of the **EIAR Addendum**. A revised assessment of Operation & Maintenance (O&M) phase collision impacts for this receptor has been provided within the **EIAR Addendum**, as detailed below.

EIAR context

291. To do this, within the EIA framework, the applicant has updated the impact magnitude section of the assessment of project only collision impacts to great black-backed gull, by incorporating consideration of PVA outputs. These changes are outlined within **Section 10.10** of the **EIAR Addendum (Part 1)**.

292. PVA outputs support an impact magnitude of low during the breeding season (in relation to Method 2 regional population definitions). For all other seasons (and annually), collision impact magnitudes to great black-backed gull are assessed to be negligible. Overall collision impact magnitude is therefore, conservatively, assessed as low. On this basis, and because the receptor sensitivity of great black-backed gull was assessed as moderate (this remains unchanged from the EIAR), the significance of project-only collision impacts to great black-backed gull is assessed to be slight and not significant in EIAR terms (which is unchanged from the impact significance concluded in the EIAR).

2.7.17 Item 7s - Regional Reference Populations

As previously noted, where impacts in the EIAR or NIS represent a >1% increase in mortality, PVA has been used to investigate population-level effects of the increases in mortality. For the PVA input parameters, the calculated regional reference populations have been entered as 'breeding adults' as starting populations.

As the breeding season regional reference populations have been adjusted to account for immature birds, the applicant is requested either:

1. *to consider only breeding birds (i.e. non-adjusted regional reference populations) in the PVA starting populations, or*
2. *to select 'all individuals' as the starting population type, as this is more representative where immatures are included and amend their assessments/documentation accordingly.*

Response

293. In relation to the Commission's request to either consider only breeding adults within PVA starting populations, or amend PVA configurations to include immature birds within PVA starting populations, the applicant has chosen to apply the second of these options as this aligns with the definition used to characterise baseline regional populations for impact assessment (**Volume 4, Appendix 10.05 Offshore Ornithology Baseline Characterisation Report** of the EIAR). Thus, PVAs for project-only or cumulative impacts to regional populations (i.e. quantitative assessments for the EIAR) were reanalysed with 'Units for initial population size' input within the Natural England PVA tool, changed from 'Breeding adults' to 'All individuals (adults and immatures).

294. Details of inputs to these updated PVAs are provided in **Appendix K Project-Only PVA Requirement Review** of this **FIR Response Document** and **Appendix 1 – Ornithology Quantitative Tables** of the **CEA Report (Part 2)** [cumulative assessment PVAs for collision impacts to regional kittiwake, great black-backed gull and herring gull populations].

295. These changes were only applied to PVAs undertaken to update EIAR elements of the assessment. For impact assessments to SPA breeding populations, where population were already related to breeding adults, no amendments to PVAs were required as the changes relate only to correction for breeding adults which are not applicable in this case.

296. Where PVAs were reanalysed with the 'Units for initial population size' input changed to 'All individuals', any differences to counterfactual outputs were inconsequential. Specifically counterfactual of growth rate (CGR) outputs, which are the most appropriate outputs for interpreting population trend consequences for density independent PVAs (as used in the impact assessment), were minimally affected by changes to the 'Units for initial population size' setting within the Natural England PVA tool.

297. In all cases, where PVAs were revised to accommodate the requested change, impact magnitude determinations and impact significance conclusions within the EIAR were unaltered.

2.7.18 Item 7t - Demographic Rates and Parameters

'It is noted that the applicant has national and global parameters in PVA models, however, these are not necessarily the most appropriate demographic rates to use for all species. Where available, regional rates (e.g. Irish Sea) or colony specific rates (where the data are considered appropriate and robust) must be applied. If regional or local rates are not available or not considered appropriate, global rates may be used with suitable justification.

The applicant is, therefore, requested to update the PVA models and assessment conclusions using the most appropriate demographic rates for each species and colony. This must be applied to both the EIAR (regional populations) and the NIS (SPA populations)

Response

298. In relation to the Commission's request to update PVA models to utilise regional or colony specific demographic rates, the applicant has re-run PVA models with the 'Region type to use for breeding success data' input of the Natural England PVA tool, changed from 'Global' with the 'Global' sector selected to 'Reg.Seas' with the 'Irish Sea' sector selected. As no appropriate colony-specific survival rate data is available, 'Available colony-specific survival rate' remained set at 'National' values.

299. Full details of inputs to these updated PVAs are provided in **Appendix 10-L Great Black-backed Gull Population Viability Analysis Parameter Log** of the **EIAR Addendum** (project-only PVA for collision impacts to regional great black-backed gull population) and the **Appendix 1 Ornithology Quantitative**

Tables of the **CEA Report (Part 2)** (all PVAs required for cumulative and in-combination assessments) and carried through to the **EIAR Addendum (Part 1)**.

300. In all cases, where PVAs were revised to accommodate the requested change, impact significance conclusions to regional populations within the EIAR, or assessment of no AESI in relation to SPA populations within the NIS were unaltered.

Mitigation and Monitoring

2.7.19 Item 7u - Red-throated Diver

'The Commission notes that mitigation measures to reduce vessel-related disturbance of Red-throated Diver are discussed in Chapter 10 (Ornithology) and 33 (Summary of Mitigation and Monitoring) of the EIAR and in Volume 5 of the NIS and comprise production of an Ecological Vessel Management Plan (EVMP) which has been submitted as supporting documentation. The EVMP includes a range of measures in relation to Ornithology (Section 3 of EVMP refers).

The applicant is requested to update the submitted EVMP to include a clear commitment ensuring that all measures which aim to reduce disturbance of Red-throated Diver are applied to vessels operating or transiting inside or within 2km of The Murrough SPA from November to March, inclusive.

The Commission also requests that the applicant reviews the findings of recent studies, such as Burger et al. (2019) and Mendel et al. (2019), where vessel speed, number of vessels passing, and vessel size have been linked to Red-throated Diver disturbance and resettlement periods. The applicant is requested to include an appropriate restriction on vessel speed. In this regard the Commission recommends that vessels are restricted to 40 km/h or 21.5 knots when operating or transiting inside or within 2km of The Murrough SPA based on findings by Burger et al. (2019).'

Response

301. **Volume 3, Chapter 10 Ornithology** of the EIAR and **Volume 5 - Assessment of Implications for Special Protection Areas - Part 1** of the NIS include discussion relating to the mitigation of disturbance to red-throated diver (*Gavia stellata*) by ensuring that vessels associated with the CWP Project adhere to an **Ecological Vessel Management Plan** (**EVMP**), which was provided as supporting documentation at the time of the Application submission.

302. On the basis of the evidence presented in Burger *et al*. (2019) and Mendel *et al*. (2019), the Applicant acknowledges the Commissions above request and has updated the EVMP accordingly, as part of the FIR response.

303. It is considered that the restriction of vessel speed outlined by the Commission, along with all other commitments within the EVMP, provides suitable and appropriate mitigation in relation to disturbance of red-throated diver by Project vessels and as such, the conclusions drawn in the EIAR (not significant) and NIS (no AESI) remain unchanged.

2.7.20 Item 7v - Roosting Terns

'The Commission notes that mitigation to reduce disturbance to roosting Sandwich Terns Thalasseus sandvicensis and Sterna spp. terns (Common, Arctic, and Roseate Terns) during construction has also been proposed. The mitigation contains a suite of measures and restrictions relating to onshore construction works, where it is stated that these measures will be in place between one hour before sunset to sunrise the following day from 15th July to 31st August, inclusive.

NPWS (2015) is cited as the source for applying restrictions from one hour before sunset, however, this reference is not included in reference lists, Chapter 10, nor 33, nor in the NIS. The applicant has previously been requested to address all missing citations throughout the Ornithology chapter of the EIAR, NIS, and relevant supporting appendices.

The proposed timing of the mitigation measures is contradictory to text presented in the NIS, where it is stated that "terns are not forming nocturnal roosting aggregations within South Dublin Bay (from sunrise until approximately two hours before sunset (Tierney et al., 2016))". This suggests that the mitigation should be applied from two hours before sunset to the following sunrise.

The Commission therefore requests that the applicant provides clarification on, and appropriate justification for, applying construction restrictions to reduce disturbance of roosting terns at one hour before sunset as opposed to two hours before sunset. The applicant is requested to produce and implement an adaptive monitoring and management plan to ensure mitigation measures are effective.'

Response

304. The Applicant acknowledges the omission of NPWS (2015) when referring to the conservation objectives, attributes and targets of South Dublin Bay and River Tolka Estuary SPA, from the reference list. This has been corrected in response to FIR Item 7a. This amendment is provided **NIS Addendum (Part 1)**.

305. With regard to the discrepancy noted by the Commission in relation to the timing of mitigation measures intended to reduce disturbance to roosting terns within South Dublin Bay during the construction phase, specifically whether mitigation should be applied from one hour or two hours before sunset, the following clarification is provided;

306. Within NPWS 2015, in relation to the "disturbance at roosting site" conservation objective attribute for the *Sterna spp*. features, Merne *et al*. 2008 is referenced to support the following statement: '*Although principally used as a night roost, birds begin to roost at least one hour before sunset…*'.

307. Within Tierney *et al*., 2016 reference is made to surveys to count roosting terns commencing two hours before sunset. i.e. in order to describe the arrival of terns to roosting areas, these surveys commence prior to terns beginning to roost.

308. As such, whilst a survey may be mobilised and surveyors *in situ* in readiness to count roosting terns two hours before sunset, the appropriate timing of mitigation to avoid disturbance to roosting terns, associated with the commencement of roosting behaviours is considered to be from one hour before sunset in accordance with NPWS (2015) and Merne *et al*., (2008).

309. **NIS Addendum (Part 1)** and **Section 10** of the **EIAR Addendum (Part 1)** have been updated to confirm that mitigation for roosting terns in South Dublin Bay during construction works will necessitate a cessation of works one hour before sunset and resume after sunrise during the period 15 July to 31 August, inclusive.

310. This approach is consistent with established behavioural evidence and recognised guidance, ensuring mitigation measures remain effective and proportionate.

311. The previous reference to two hours before sunset (Tierney *et al.,* 2016) will be retained in the EIAR Addendum for transparency, with clarification that this timing was survey-specific and not intended as a behavioural threshold.

312. As described in the updated **IPPEMP**, with regards intertidal monitoring, it is noted that the Applicant has introduced mitigation measures in the form of a seasonal restriction for over wintering, and a further timing restriction to reduce disturbance to roosting terns. These measures are robust, reflective of best practice and, given the precedence of the same measures within other marine licences in the

same area, remove any reasonable scientific doubt as to the effectiveness of them. As such the primary objective will be to contribute towards the scientific understanding of bird behaviour within the intertidal area. Notwithstanding this, the Commission has requested the Developer to "produce and implement an adaptive monitoring and management plan to ensure mitigation measures are effective" (despite not having cited any basis for doubt as to the effectiveness of measures proposed). Accordingly, as noted within **Table 4-6** of the **updated IPPEMP**, it is proposed that the results will be reported to the Regulatory Authority at appropriate frequencies such that in the unlikely event of adaptive measures being required they can be agreed and implemented in a timely manner.

Cumulative, In-combination and Transboundary Effects

2.7.21 Item 7w - CEA

'The applicant is requested to apply the further information points presented above to their cumulative effects assessment (EIAR) and in-combination assessment (NIS) and make relevant amendments as necessary.

The Cumulative Effects Assessment (CEA) must consider barrier effects to migratory birds, especially those migrating to and from sites that are directly west of the CWP array site.'

Response

313. The applicant has amended the CEA and in-combination assessments in accordance with the further information points presented above and has also updated these assessments to incorporate updated information regarding the impacts of other plans and projects since submission of the original CWP application in September 2024.

314. The updated CEA for ornithology is presented in **Section 10** of the **CEA Report (Part 2)**.

315. The updated In-combination Assessment is presented in **NIS Addendum (Part 3).**

316. Where quantitative assessments are undertaken, the derivation of cumulative and in-combination impact totals and their contextualisation to permit assessment is provided in the **Appendix 1 Ornithology Quantitative Tables** of the **CEA Report (Part 2)**.

317. In relation to the updated CEA, all cumulative impacts to regional populations are assessed as non-significant in EIA terms.

318. In relation to the updated In-combination assessment, all in-combination impacts to SPAs screened for consideration within the NIS are assessed to result in no AESI.

319. With regard to barrier effects to migratory birds, project-only impacts are assessed to be of imperceptible significance. This is based upon two factors:

- Firstly, there is a significant body of evidence demonstrating the passage of migratory species though wind farm arrays (for example, Liedtke *et al*., 2025; Welcker *et al*., 2017), which contrasts with a general absence of evidence to demonstrate migratory species altering flyways to avoid array areas. This manifests as low to very low receptor sensitivities within the project-only EIA; and
- Secondly, if migratory species do in any instances alter their flight paths to avoid passing through array areas, the one-off energetic costs associated with such relatively small deviations (during typically large migratory movements) are considered to be inconsequential in relation to energy reserves recruited for migration (Masden *et al*., 2009; Speakman *et al*., 2009). This manifests as negligible impact magnitude within the project-only EIA.

320. As project-only impacts resulting from barrier effects are assessed to be imperceptible it is concluded in the **CEA Report (Part 2)** that the project does not meaningfully contribute to cumulative impacts resulting from barrier effects to regional flyway populations or, more specifically, to the migratory populations of Irish east coast sites.

Updated data

2.7.22 Item 7x – ObSERVE II

'The Commission notes that the 2024 ObSERVE II Programme Reports were published subsequent to the lodgement of the current planning application. The applicant is requested to review the outputs of the 2024 ObSERVE II Programme Reports, and incorporate these results within their ornithological assessments, as appropriate, updating the EIAR and NIS where relevant.'

Response

321. The applicant acknowledges the publication of the 2024 ObSERVE II Programme Reports since lodgement of the current planning application and has reviewed these outputs.

322. These reports are:

- The seasonal distribution and abundance of seabirds, cetaceans and other megafauna off the south and southwest Irish coast (Paradell *et al.* 2024a).
- Aerial Surveys of Cetaceans and Seabirds in Irish waters: Occurrence, distribution and abundance in 2021-2023 (Paradell *et al.,* 2024b);

323. With regards to incorporating these reports into the ornithological assessment and updating the EIAR and NIS where the relevant the following response is provided:

Paradell et al. 2024a:

324. This report summarises the estimated abundances and distributions of seabird species within approximately 20 to 30 nautical miles of the south and southwest Irish coast. Surveys were between, approximately, the Dingle Peninsula in county Kerry and Cahore Point in county Wexford. Visual aerial surveys were undertaken in summer and autumn 2021 and summer, autumn and winter 2022. This report summarises information on the use by seabirds of marine areas which are beyond, approximately, 50 km of the closest part of the CWP development area. The information presented therein is not considered relevant in relation to supplementing regional population estimates or providing additional contextualisation of baseline characteristics on the basis that the area covered does not fully overlap with the zone of influence of the CWP Project.

Paradell et al. 2024b:

325. This report includes estimated abundances and distributions of seabirds across, approximately, 80% of Ireland's Exclusive Economic Zone (EEZ) marine area from visual aerial surveys undertaken in summer 2021 and 2022 and winter 2022/23. This report does not provide additional data suitable for

supplementing regional population estimates or contextualisation of baseline characteristics for the following reasons:

- Although Paradell *et al.* 2024b provides valuable broad-scale information on the relative occurrence of seabirds in Irish waters, its utility for informing regional population estimations against which impacts are assessed within the EIAR is limited, as it was not intended for this purpose. The area covered by these surveys (focussed upon the Irish EEZ) is not an area that can be used to determine biologically meaningful regional population sizes to use as the basis for assessing impacts to breeding or non-breeding seabird populations.
  During the breeding season, when breeding adult seabirds are central place foragers, the use of species-specific foraging ranges (from Woodward *et al.*, 2019) is the most robust and appropriate approach to determine which colonies are likely to have meaningful potential connectivity with the proposed development, and the sizes of these colonies can then be used to define regional population estimates. This approach has been used for the original application.
  During the non-breeding season, when seabird distributions are not restricted by the requirement to attend a breeding colony, the most robust and appropriate approach is to consider other biologically relevant factors when defining regional populations to use as a basis for impact assessment. Within the original application, this is accounted for by expanding estimated non-breeding populations from Biologically Defined Minimum Population Scale (BDMPS) areas around the UK (Furness, 2015), to cover the western Irish Sea. Biological factors considered in the definition of species-specific BDMPS region populations include demographic rates, census information and phenological and migratory movement data.

- Although Paradell *et al.* 2024b provides useful snapshots of the relative use of areas by seabirds within the western Irish Sea region (ObSERVE II, Stratum 5), the spatial resolution of these data are coarse in comparison to those available from ObSERVE I surveys. While ObSERVE II data are likely to be useful for informing general patterns for other strategic-scale applications within Irish waters, the resolution of these data are not considered fine enough to usefully inform robust predictions for EIA.
  - For example, red-throated diver population abundance estimates for the western Irish Sea region derived from ObSERVE I datasets (Jessop *et al.*, 2018) were incorporated into adapted BDMPS regional populations used for impact assessment within the original application. These surveys involved 55 transects over the western Irish Sea region. In comparison, ObSERVE II coverage of the equivalent area involved only 6 transects and no information on diver observations is provided within Paradell *et al.* 2024b.

326. Notwithstanding the above, it is noted by both the Commission and the Applicant that reporting on ObSERVE II surveys was published after the original EIAR submission and was therefore not available to inform early-stage ornithological characterisation. ObSERVE II methodology and objectives are aligned with national-scale monitoring and policy requirements, rather than project-specific ornithological impact evaluation. As such, it is considered that whilst the ObSERVE II surveys validate the existing baseline characterisation, the incorporation of these data would not materially improve the accuracy, precision or reliability of the site-specific assessment already undertaken.

2.8 Item 8 Subtidal and Intertidal Ecology

Survey Methodology and Data Gap

2.8.1 Item 8a - Imagery Data

'The Commission notes that no seabed imagery data was collected in the project-specific 2021 surveys (e.g., drop down video (DDV)), and it is unclear why it had not been included in the methodology for these surveys.

The Commission further notes that in the earlier published 2020 Scoping Report, Section 9.3.2, it states: "Sampling will be undertaken using a combination of Drop Down Video (DDV) where there is harder substrate unsuitable for benthic grab sampling." It is subsequently noted that of the 46 targeted sampling stations of the 2021 surveys, 5 were deemed unsuitable for grab sampling due to hard ground. No rationale for the exclusion of DDV data collection is presented in Appendix 8.3 and/or Chapter 8 of the EIAR.

While the Commission acknowledge that consultation on the baseline survey design and methodology was carried out and agreed prior to surveying (The National Parks and Wildlife Service (NPWS) and the Marine Institute (MI) in June 2021), it is not specifically stated if there had been agreement over the collection of imagery data (in EIAR Chapter 8 Table 8-1).

The applicant is, therefore, requested to provide confirmation on how the survey data collected was analysed to predict seabed habitats, and to provide rationale for why collection of imagery data was not included in the survey scope.'

Response

327. **Section 4.2** of **Volume 4**, **Appendix 8.3 Benthic Baseline Report** of the EIAR provides the methodology for the data analysis used to determine the seabed habitats present. As described in **Section 2.2** of **Appendix 8.3**, the sampling design was informed by the site specific geophysical data and publicly available seabed habitat data. From this process the majority of sampling locations were deemed to be sedimentary and the approach was to sample these stations by benthic grab. Five sampling stations were predicted to be hard substrate and were analysed via DDV and as stated this survey design and sampling methodology was agreed with the NPWS and the Marine Institute (MI) in June 2021. However, following further refinement of the CWP Project boundary those stations were no longer inside the Project Application Boundary (PAB). As such the results were not deemed relevant for the characterisation as they were outwith the relevant Zone of Influence (ZoI) and were not included in **Appendix 8.3** of the EIAR.

328. In response to Item 8a of the FIR, the Applicant has undertaken a validation survey to provide contemporary visual data of the seabed locations within the offshore development area. The Applicant completed an additional benthic subtidal survey using both benthic grab and DDV at 46 sampling stations in September 2025 (see **Table 2** in this **FIR Response Document**). The survey design was agreed with the Marine Institute (MI) in August 2025. The results of the contemporary site specific DDV stations are summarised in **Section 8.6** of the **EIAR Addendum (Part 1)** and provided in full in **Appendix 8-A Benthic Subtidal Survey Report 2025** of the **EIAR Addendum**. **Section 8.10** of the **EIAR Addendum (Part 1)** reflect the 2025 survey data. This data validates both the baseline characterisation and impact assessment conclusions of the EIAR.

329. Whilst the 2025 DDV survey did identify four additional epifaunal biotopes, they were present at a small number of stations and associated with the infaunal biotopes that exist underneath at all but one station. These biotopes therefore form a component of the biotope matrix and the broad habitat receptor groups described in the EIAR.

330. **Section 8.10** of the **EIAR Addendum (Part 1)** concludes that the existing characterisation remains valid and thus the assessment conclusions are unchanged.

2.8.2 Item 8b - Potential Array Data Gap

'The Commission notes that on the basis of the information submitted that there is a potential data gap within the south-west region of the array site.

i. Sampling Design - EIAR Appendix 8.3 Section 2.2.1 states "A carefully designed stratified sampling programme was developed based on geophysical survey data and other publicly available data on benthic habitats." However, on review of Appendix 8.3 Figure 5.6, the south-west region of the array site appears to have limited coverage in sampling stations. On the basis of the details within the submitted EIAR the Commission's understanding is that the mapping of seabed habitats in this area is based on geophysical data only, although it is noted that a mosaic of different biotopes in that area has been predicted (EIAR Chapter 8, Figure 84). It is unclear if this potential data gap in this area was pre-determined as per the sampling programme, or is a consequence of being unable to successfully sample at 5 stations where ground was too hard and thus unsuitable to grab.

The applicant is therefore requested to confirm if grab sampling was proposed to be undertaken in the south-west region of the array site, and if not, provide rationale and any further evidence or information that contributed to the identification of the mosaic of different biotopes identified in this area.

ii. Secondary Data - The Commission notes that the 2020 Scoping Report lists characterisation surveys undertaken at the Codling Wind Park (CWP) between 2001 and 2008 that are to be used to develop the Benthic and Intertidal Ecology baseline (Scoping Report - Section 9.3.1.1, Table 9.1). However, it is unclear on review of EIAR Chapter 8 if these earlier surveys had been included to support the more recent 2021 project-specific surveys, as these data sets are not listed in Chapter 8, Table 8.2. It is unclear if these datasets would have provided site-specific information across the CWP Planning Application Boundary (PAB), and across those areas that had not been able to be ground-truthed through grab sampling.

The applicant is therefore requested to provide confirmation if these surveys listed in Scoping were used to support the baseline characterisation for Benthic and Intertidal Ecology in the EIAR, and if not, provide rationale as to why.'

Response

331. *8b(i):* As described in **Section 2.2** of **Appendix 8.3 Benthic Baseline Report** of the EIAR, the sampling design was informed by the site specific geophysical data and publicly available seabed habitat data to produce a stratified sampling design as opposed to a grid design. The sampling design was agreed in consultation with NPWS and the MI in June 2021 as set out in **Table 8-1**, **Section 8.2** of **Chapter 8 Subtidal and Intertidal Ecology** of the EIAR. Sampling was not undertaken in the southwest corner as a result of the stratified sampling approach. As noted in response to FIR **Item 8a**, the areas of hard ground that were not possible to sample were no longer included as they were outside of the relevant ZoI.

332. Notwithstanding this, to ensure the baseline characterisation data presented within the EIAR and associated appendices remain valid, the Applicant commissioned an benthic subtidal survey using both benthic grab and DDV in 2025. The survey located 46 sampling stations to provide further coverage across the array area and OECC; the survey design and methodology was agreed with the MI in August 2025. The results are provided in **Appendix 8-A Benthic Subtidal Survey Report 2025. Section 8.6** and relevant paragraphs of **Section 8.10** of the **EIAR Addendum (Part 1)** reflect the additional baseline information.

333. The 2025 subtidal survey included sampling stations in the south west corner of the array site where the Commission notes a data gap. The results show mainly the biotope *Spirobranchus triqueter* with barnacles and bryozoan crusts on unstable circalittoral cobbles and pebbles (SS.SCS.CCS.SpiB) with one station identified as Circalittoral mixed (SS.SMx.CMx) sediment both of which were identified in the 2021 subtidal survey. Two stations in this area comprised the biotope Polychaete-rich deep Venus community in offshore mixed sediments (SS.SMx.OMx.PoVen). Whilst this biotope was not identified in the 2021 survey it sits within the broad habitat receptor group 'Mixed sediment habitats' which was identified within the regional datasets used in the original assessment, and as such does not result in any meaningful change to the existing characterisation or the associated assessment.

334. **Section 8.10** of the **EIAR Addendum (Part 1)** concludes that the EIAR characterisation remains valid and thus the assessment conclusions are unchanged.

335. *8b(ii):* In response to Item 8b(ii) of the FIR, the Applicant can confirm that the Codling Wind Park surveys listed in the Scoping Report Table 9.1 were used to inform the baseline characterisation in **Section 8.6** of **Chapter 8 Subtidal and Intertidal Ecology** of the EIAR, however the site specific survey table was omitted from **Section 8.4** of **Chapter 8 Subtidal and Intertidal Ecology** of the EIAR in error. In order to address Item 8b(ii) of the FIR, **Table 8-A** (which includes this data) has been added to **Section 8.4** of the **EIAR Addendum (Part 1)**.

Reef Habitat with the Planning Application Boundary

2.8.3 Item 8c

The Commission notes that EIAR Chapter 8 Figure 8.3 (Special Areas of Conservation within the benthic and intertidal ecology study area) shows 'Predicted Annex I' reef habitat to overlap the CWP PAB (as reported under Article 17 of the EU Habitats Directive). However, it is also noted in both EIAR Appendix 8.3 (Section 6), and EIAR Chapter 8 (Paragraph 68), that "No Annex I habitats or Annex II species were recorded during the site-specific surveys of the Offshore Development area. Whilst the reef forming species Sabellaria spinulosa and Sabellaria alveolata were found in the array and cable corridor areas, abundances were relatively low, and no stations were classified as Sabellaria reef habitat."

The application documentation does not provide any clarity as to how the absence of Annex I reef (biogenic and/or rocky) within the CWP PAB has been determined and/or confirmed. The Commission, therefore, requests that the applicant provide further details and discussion on this matter as set out below:

i. Faunal Grab Data - The raw faunal grab data was not provided as part of the EIAR Appendix 8.3. This data should be included in the baseline survey report as it can inform relative abundances of key species, such as the reef building worms Sabellaria spinulosa and Sabellaria alveolata. The applicant is requested to include the subtidal faunal grab data from the 2021 project baseline surveys to provide information on the abundances of Sabellaria spp. recorded.

ii. *Reef Assessment - The Commission notes that the applicant has not presented how the relevant survey data (geophysical and biological) had been reviewed and subsequently assessed for the presence/absence of biogenic and/or rocky reef. This is also in consideration, that no imagery data were collected from any of the sampling stations within the PAB.*

Whilst the Commission notes that those biotopes predicted as present may not be indicative of Annex I reef habitat (e.g., Spirobranchus triqueter with barnacles and bryozoan crusts on unstable circalittoral cobbles and pebbles), the applicant is requested to provide a statement and discussion of how this conclusion has been reached based on data that had been collected within the PAB (e.g. grabs and geophysical), and in light of the absence of imagery data being available to support a baseline characterisation for the CWP.

The applicant is therefore, requested to provide detailed evidence of how the absence of Annex I reef (rocky and/or biogenic) has been assessed and determined.

Response

336. Site specific geophysical data was analysed to inform the subtidal benthic survey design as set out in **Section 2.2** of **Appendix 8.3 Benthic Baseline Report** of the EIAR and found all stations within the existing PAB boundary to be sedimentary. **Section 5.2** of **Appendix 8.3** provides the results of benthic sediment particle size and infaunal analysis culminating in the biotope assignment which found the majority of stations to be biotopes within the circalittoral coarse sediment category with the exception of three stations in the nearshore sections of the OECC classified as infralittoral muddy sand.

337. As noted in response to 8a and 8b the Applicant has completed a validation benthic subtidal survey, the survey design and methodology for which was agreed with the MI in August 2025. The results are provided in **Appendix 8-A Benthic Subtidal Survey Report 2025** of the **EIAR Addendum**, including the subtidal infaunal species lists from the 2021 and 2025 benthic subtidal surveys.

338. The 2025 under water video data was subject to a reefiness assessment and analysed to determine epifaunal biotopes present in the offshore development area. Of the forty-six stations sampled, seven stations located in the array site were assessed as having attributes that could contribute to a determination of low resemblance stony reef, including composition, elevation and biota. It should be noted however, that these features were patchy in distribution and do not meet the extent criteria, and the geophysical data for the site classified the array site as sedimentary. As such the sites are not considered as having a 'low resemblance' to Annex I stony reef.

339. Findings from the 2025 subtidal survey are summarised in **Section 8.6** and relevant paragraphs of **Section 8.10** of the **EIAR Addendum (Part 1)** reflect the 2025 baseline information. This data validates both the baseline characterisation and impact assessment conclusions of the EIAR.

340. **Section 8.10** of the **EIAR Addendum (Part 1)** concludes that the EIAR characterisation remains valid and thus the assessment conclusions are unchanged.

341. It is acknowledged that the biogenic reef features are ephemeral. As such, pre-construction geophysical and benthic surveys will be conducted as set out in the updated **IPPEMP**.

Annex 1 Reef within the Wicklow Reef SAC

2.8.4 Item 8d

2.8.5 'The Commission notes that there is conflicting information presented in the EIAR Chapter 8 regarding the type of reef feature that the Reef QI within the Wicklow Reef Special Area of

Conservation (SAC) represents and thus what is assessed. There is no consistency between what was presented in the baseline, and the identification of, and assessment of representative receptors.

Section 8.6.7 ('Habitats/Species of Conservation Importance'), Paragraph 68 states: "Sabellaria reefs are present in the Wicklow Reef SAC." Whereas, in the subsequent impact assessment sections, in Paragraph 210, the SAC is described, as "containing areas of current-swept subtidal reef comprised of cobbles, boulders, and an area of sloping bedrock……. the highly dynamic nature of the area is unlikely to support a stable biogenic reef". This statement in Paragraph 210, directly contradicts the statement made upfront in Chapter 8 (Section 8.6.7, Paragraph 68).

In addition, Chapter 8 Section 8.6.6 (Identification of Receptors) states that: "….[from] the establishment of the baseline environment, the existing benthic and intertidal ecology receptors have been identified and are provided in Table 8-9 below." However, in Table 8-9, the broad habitat type of 'Rock and biogenic reef' is listed, with the biotopes belonging to this being 'Infralittoral rock and biogenic reef', 'Circalittoral rock and biogenic reef', and 'Offshore circalittoral rock and biogenic reef'. In the impact assessment of Section 8.10.1 (for 'Impact 2 – Temporary increase in SSC during construction'), potential impacts for Wicklow Reef SAC are assessed under the Receptor Group of 'Subtidal Rock' only.

The applicant is therefore requested to confirm reef habitat type (biogenic and/or geogenic) present in the SAC and amend the EIAR (and NIS if necessary) to ensure there is consistency throughout on this matter.'

Response

342. The Qualifying Interest of Wicklow Reef SAC are Annex I Reef. Paragraphs 68 and 210 of **Chapter 8 Subtidal and Intertidal Ecology** of the EIAR both reference the NPWS Wicklow Reef SAC (site code: 2274) Conservation Objectives Supporting Document upon which the statements in these paragraphs are based. These note that the community types present are current swept subtidal reef community complex (bed rock) and current swept subtidal reef community complex (cobbles and boulders) (Conservation Objective Series, NPWS, 2013[3]), but also that Wicklow Reef is an example of a subtidal reef constructed by the honeycomb worm *Sabellaria alveolata* (Site Synopsis, NPWS, 2014[4]). The Conservation objectives supporting document - Marine Habitat (NPWS, 2013[5]) states that *'While the reef-forming polychaete Sabellaria alveolata has been recorded from this area in the past, and Wicklow Reef SAC was designated inter alia for this feature, it appears that its occurrence within this site may be questionable. Current knowledge suggests that the highly dynamic nature of this area is unlikely to support a stable biogenic reef composed of S.alveolata for any length of time.'*

343. Accordingly, the assessment within the EIAR is considered complete and based on the best available information for the SAC. Within the EIAR, reef features of Wicklow Reef SAC were included on a precautionary basis as the site and its associated habitats fell within the study area for the assessment. The assessment within the EIAR was undertaken on a precautionary basis, and states that that there would be no effect on the features of the Wicklow Reef SAC from increases in SSC or smothering arising from the CWP Project. This conclusion was reached on the basis of the sediment plume modelling that was undertaken for the CWP Project, and is validated by updated modelling completed

[3] https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002274.pdf
[4] https://www.npws.ie/sites/default/files/protected-sites/synopsis/SY002274.pdf
[5] https://www.npws.ie/sites/default/files/publications/pdf/002274_Wicklow%20Reef%20SAC%20Marine%20Supporting%20Doc_V1.pdf

by the Applicant in response to the Commission's FIR (see **Section 2.6 Item 6 Marine Geology, Sediments and Coastal Processes** above). This also finds no connectivity with the reef features of Wicklow reef SAC (as evidenced in **Appendix 6-A Modelling Report Addendum** of the **EIAR Addendum**).

344. Notwithstanding this, in response to Item 8d of the FIR, the Applicant commissioned a DDV survey of the section of Wicklow Reef SAC which lies within the Applicant's Foreshore Investigation Licence, and an area just north of the SAC. The results are provided in **Appendix 8-C DDV Wicklow Reef Survey Report 2025** of the **EIAR Addendum**. In brief**,** the findings provide additional scientific data on the habitats present within the SAC, but do not meaningfully change any of the information or assessment presented within the EIAR. The survey has identified limited areas of potential biogenic or stony reef habitat, and whilst this does not change the EIAR assessment the Applicant submits this data in support of SAC monitoring and to enhance the scientific understanding of the Wicklow Reef SAC.

Construction Activities and Mitigation for South Dublin Bay SAC

2.8.6 Item 8e

'The Commission notes that whilst a level of detail has been provided in EIAR Chapter 4 (Project Description) around the proposed construction activities at the landfall area, the impact assessment in EIAR Chapter 8 would have benefited from a clearer correlation with expected impact footprint(s) from open cut trenching (OCT). The description of the potential impacts and related mitigation at the South Dublin Bay SAC is not clearly outlined in the EIAR and in the Natura Information Statement (NIS) in relation to Benthic and Intertidal Ecology.

Only area footprints (e.g. m² and km²) are presented to describe the impact of 'Temporary habitat disturbance', with no estimated volume of sediment that will be disturbed (m³). It is noted that burial depths are described as being a "minimum depth of cover of 1.4 m", therefore, indicating that trenching may be deeper. No further description of OCT activities has been presented in EIAR Chapter 8.

The Commission also understands that the cofferdam will only be installed at the top of the shore. Therefore, it is assumed that OCT without a temporary cofferdam installed will be undertaken for the majority length of the trench in the intertidal area. As such, the Commission does not agree with the statement: "Whilst construction activities in the intertidal and landfall areas such as open cut trenching will disturb the sediment, the works will be conducted at low tide and as such have no potential to lead to increases in SSC" (EIAR Chapter 8 Paragraph 158). Following tidal inundation, disturbed sediments will generally be at greater risk of mobilisation than undisturbed sediments. Furthermore, any plumes generated from construction activities in the shallow infralittoral zone may also overlap the intertidal area.

The applicant is, therefore, requested to review and update the EIAR and NIS for Benthic and Intertidal Ecology, to provide a more robust assessment of risk to the Dublin Bay SAC and its features. Clear presentation to OCT and its expected footprints would be beneficial to the assessment sections associated with this activity. The applicant is advised that further to the request under 6(g)(iii) (above) the updated benthic and intertidal ecology assessment should consider in full all construction methodologies considered and proposed at this location.'

Response

345. **Volume 2, Chapter 4 Project Description** of the EIAR provides the full description of the CWP Project, including all works in the intertidal. The key information relevant to the assessments in **Chapter 8 Subtidal and Intertidal Ecology** of the EIAR, including the greatest potential footprint of the area affected by either open cut trenching or a shallow water trenching tool in the intertidal, is presented in **Table 8-12** of **Section 8.3.3** of **Chapter 8 Subtidal and Intertidal Ecology** of the EIAR and in **Table 5, Section 2.1.1** of the NIS. The Applicant confirms that this is the only methodology under consideration.

346. **Chapter 8 Subtidal and Intertidal Ecology** of the EIAR uses area footprints as the relevant parameter for assessing the impact of temporary direct habitat disturbance on benthic ecology receptors. Intertidal benthic fauna are typically found in the upper layers of the sediment (i.e. the upper 40cm) and the maximum trench depth was therefore not considered a relevant parameter for this assessment.

347. With regards to suspended sediment impacts, **Chapter 6 Marine Geology, Sediments and Coastal Processes** of the EIAR presents and assesses the estimated volumes of sediments that may be disturbed in terms of potential for suspended sediment concentrations and levels of deposition. It is these values that are used in **Chapter 8 Subtidal and Intertidal Ecology** to determine impact magnitude for impacts associated with suspended sediments and associated deposition.

348. The assessments in **Chapter 8 Subtidal and Intertidal Ecology** consider the worst case footprint for all works in the intertidal area, and as such is considered to be representative. Nevertheless, the Applicant has updated the assessment on the intertidal features within Dublin Bay, and refer to **Section 8.10.1** of the **EIAR Addendum (Part 1)**. The assessment is based on **Volume 2, Chapter 4 Project Description** of the EIAR and updated sediment plume modelling described in **Appendix 6-A Modelling Report Addendum** of the **EIAR Addendum**. The assessment includes details on the activities within the intertidal area under EIAR Impact 1: Temporary Habitat Disturbance, and revision of the contradictory paragraph on suspended sediment behaviours with respect to Impact 2: Temporary increases in SSC. It is noted that the EIAR assesses the impacts with respect to the receptors present (noting their increased conservation value in this location), whilst the **NIS Addendum (Part 1)** assesses the impact to the SAC with respect to its Conservation Objectives.

349. The additional information on the construction activities under Impact 1 do not alter the input parameters of the assessment which is already based upon the full extent of the proposed works and considers the sensitivities and recovery potential of the specific habitats present within Dublin Bay (as set out in **Chapter 8 Subtidal and Intertidal Ecology** of the EIAR). As such the conclusions in the EIAR remain appropriate and robust.

350. With regard to increases in suspended sediment and deposition of remobilised sediments (Impact 2) in the intertidal area, paragraph 158 of the EIAR has been replaced in **Section 8.10.1** of the **EIAR Addendum (Part 1)** to better reflect the assessment of elevated SSC and deposition that has already been undertaken on these habitats (see paragraphs 229 to 240 of the EIAR). Further information on the status of the intertidal sediments, including analysis of likely sediment transport is presented in **Appendix 8-B Intertidal Survey Report** of the **EIAR Addendum.**

351. With regard to increases in suspended sediment and deposition of remobilised sediments in South Dublin Bay SAC, **Section 2.1.1.1.1** of **Volume 4** of the NIS is supplemented by **NIS Addendum (Part 1)** with updated sediment plume modelling and assessment of the impact of increased SSC and sediment deposition within South Dublin Bay SAC. The findings of the updated modelling validate the original conclusion in the NIS that there will be no adverse effects on the site integrity of the South Dublin Bay SAC from increased SSC and sediment deposition. As such the conclusions remain appropriate, robust, and without reasonable scientific doubt

Long-term Habitat Loss

2.8.7 Item 8f

'In EIAR Chapter 8, Paragraph 114 and 297, two different percentage values are presented for the spatial extent of coarse sediments within the array site. Paragraph 114 states up to 99.997%, whilst Paragraph 297 states c.0.99%. Whilst assumed this may be a typographical error, the values are to be confirmed. The applicant is requested to confirm percentage loss of sublittoral coarse sediments.'

Response

352. The Applicant can confirm that paragraph 297 of **Section 8.10**, **Chapter 8 Subtidal and Intertidal Ecology** of the EIAR contains a typographic error. The value presented in paragraph 114, noting that the coarse sediment comprises up to 99.997% of the spatial extent of the array is correct. This typographic error has now been corrected in paragraph 16 of **Section 8.10.2** of the **EIAR Addendum (Part 1)**.

Screening of Wicklow Reef Special Area of Conservation

2.8.8 Item 8g

'The Commission seeks further clarity on the rationale for Wicklow Reef SAC being screened out for assessment in the NIS. In Volume 3 NIS (Screening) Table 3-1, Wicklow Reef SAC is screened out for assessment, citing hydrodynamic conditions, concluding that there is no potential for any connectivity with the CWP project for the impacts of 'Increased SSC leading to smothering' and 'Remobilisation of contaminated sediments'.

In Volume 3 NIS (Screening) Table 2-1, under the pressures of 'Temporary increases in suspended sediments/smothering' and 'Remobilisation of contaminated sediments', the following zones of influence (ZoIs) for these impact pathways generated via dredge disposal and /or cable installation are described:

- *4-10 km eastwards for plumes generated in the array site; and*
- *<7 km eastwards, 5 km south eastwards, and 4 km westwards for plumes generated in the offshore export cable corridor (OECC).*

The Wicklow Reef SAC is located to the south-west of the array site, and south of the OECC (see Chapter 8, Figure 8.3). In Volume 3 NIS (Screening) Table 3 -1, the SAC is listed as 4.91 km from the PAB. Therefore, on review of the predicted maximum extents of plumes, there is the potential for overlap with the SAC. The Commission also notes that within the SAC, Annex I reef feature is predicted to cover 100% of the site and therefore, if there is an overlap with the SAC boundary it is likely to also overlap this designated feature.

Furthermore, the Commission also notes that in EIAR Chapter 8, potential impacts on the Wicklow Reef SAC are assessed, where it is presented as located within the 10km predicted sediment plume extent of the Benthic and Intertidal Ecology Study Area (Chapter 8 Figure 8.3).

The applicant is therefore requested to review the screening decision for Wicklow Reef SAC in the NIS. If no change is required (the SAC is to remain screened out), the applicant is requested to provide

further rationale and justification to support this outcome. However, in the absence of sufficient justification in relation to the points raised above, the SAC should be brought through for further consideration, assessment, and review in the NIS.'

Response

353. **Volume 3 - Screening** of the NIS screens out Wicklow Reef for any potential impact from 'Temporary increases in suspended sediments/smothering' and 'Remobilisation of contaminated sediments' as based upon the hydrodynamic conditions present in and around the offshore development area, it is concluded that there is no potential for any connectivity with the CWP Project. This approach is consistent with the Office of the Planning Regulator's Practice Note PN01 regarding NIS Screening, which states that all proposed developments located either partially or wholly within or immediately adjacent to a SAC or SPA should be screened in, whilst a ZoI should be established using the Source-Pathway-Receptor framework to screen out where there is no ecological pathway or functional link present.

354. Within the EIAR, the reef features of Wicklow Reef SAC are included in the assessment on a precautionary basis as the site and its associated habitats fell within the study area for the assessment. The assessment within the EIAR was undertaken on a precautionary basis, and states that that there would be no effect on the features of the Wicklow Reef SAC from increases in SSC or smothering arising from the CWP Project. This conclusion was reached on the basis of the sediment plume modelling that was undertaken for the CWP Project (**Appendix 6-A Modelling Report Addendum** of the **EIAR Addendum**).

355. However, in response to Item 8g of the FIR, the Applicant has provided an update in **NIS Addendum (Part 1)** to reflect the outcomes of updated sediment plume modelling (undertaken in response to FIR Item 6i) with regards to the screening out of Wicklow Reef SAC. The updated sediment plume modelling predicts that plumes of suspended sediment generated during dredge disposal and cable installation activities (trenching) will travel in a north-south / slight east direction. Although plumes generated at the array site may travel up to 7 km they will not reach the Wicklow Reef SAC due to their direction of travel – the SAC lies to the south west of the array area. Although the Wicklow Reef SAC lies to the south of the OECC, plumes generated (which may travel up to 6 km) will not reach the Wicklow Reef SAC which is greater than 11 km from the OECC at its closest point.

356. Given this, the screening clarification provided in **NIS Addendum (Part 1)** concludes that the existing screening out of Wicklow Reef SAC remains valid and there is no potential for Likely Significant Effect.

Screening of Impacts and Pressures and Associated Terminology

2.8.9 Item 8h - Scour effect from Placement of Infrastructure

'The Commission notes that indirect effects of scour on Benthic and Intertidal Ecology from the long-term installation of infrastructure above the seabed has not been considered and/or assessed in the EIAR Chapter 8.

Chapter 8 lists the impacts that are to be scoped in for assessment (in Table 8-11), however, it does not list those to be scoped out and a rationale provided.

Whilst the placement of scour protection will lead to protection of the assets themselves (e.g., cables and monopile foundations). The placement of protection on top of, and elevated above the seabed may locally affect hydrodynamics, resulting in scour effects on benthic communities throughout the operational lifetime of the CWP.

EIAR Chapter 8 states that the scope of assessment was agreed during consultation. However, in Chapter 8 Table 8-1 (consultation responses relevant to subtidal and intertidal ecology), it does not detail the consultation conclusions for the risk from scour through localised changes in marine processes. It is noted that in EIAR Chapter 6 (Marine Geology and Coastal Processes) that the impact 'Scour around installed structures and associated sediment transportation leading to changes in seabed composition, structure or morphology' was scoped in for assessment. On the basis of the documentation submitted it is currently unclear as to the outcome of the consultation agreed for Benthic and Intertidal Ecology in reference to this related impact pathway.

The applicant is therefore, requested to provide the full list of, and rationale of those impacts scoped out of assessment in the EIAR in relation to Benthic and Intertidal Ecology. Should there be insufficient rationale in relation to any elements (particularly for 'Scour around installed structures and associated sediment transportation leading to changes in seabed composition, structure or morphology'), then the applicant is required to provide an impact assessment for the relevant receptor groups.'

Response

357. **Section 8.7** of **Chapter 8 Subtidal and Intertidal Ecology** of the EIAR provides all potential impacts on benthic and intertidal ecology considered at scoping and the Applicant can confirm that none of these impacts were scoped out of the assessment as detailed in the EIA Scoping Report (CWP, 2021). The potential effect from scour around installed structures is considered within the impact of temporary habitat disturbance in the assessment, **Section 8.10** of **Chapter 8 Subtidal and Intertidal Ecology** of the EIAR.

358. In response to Item 8h of the FIR, the Applicant has provided an update in **Section 8.7** of the **EIAR Addendum (Part 1)** to clarify that scour around installed structures is considered under the impact of temporary habitat disturbance. Any predicted areas of scour will be addressed through provision of scour protection as per the Representative Scenarios, and as such any scour that does occur throughout operation will only be small in scale and limited to infrequent periods where the potential for scour exists beyond any areas of installed scour protection. As such, the conclusions of Impact 3: Temporary habitat disturbance during the operation and maintenance phase (that impacts will be less than, or equal to, those assessed for construction) remain valid.

2.8.10 Item 8i - Effects not considered in Screening in the NIS

'The Commission notes that for consistency, all effects/pressures not considered for screening in the NIS are to be presented and the rationale provided. For example, there is no statement presented in NIS Volume 3 Screening for why 'Accidental pollution events' has not been considered in the screening stage. However, a statement has been presented as to why effects arising from hydrodynamic changes from installation of CWP infrastructure is scoped out (Paragraph 18).

The applicant is therefore requested to provide the full list of, and rationale of those effects/pressures not considered for screening in the NIS.'

Response

359. **Section 2** of **Volume 3 - Screening** of the NIS sets out the approach to screening for benthic and intertidal ecology Qualifying Interests (Qis) of protected sites with the potential for connectivity. All impacts with the potential to result in LSE are assessed in Table 2-1. Whilst other activities of the CWP development may have the potential for interactions with the marine environment, such interactions

are not considered to have the potential to give rise to LSE on any benthic and intertidal ecology feature of any protected site.

360. Accidental pollution events is not considered as a pressure for offshore wind energy production according to Feature Activity Sensitivity Tool (FeAST) established and maintained by the FeAST working group which consists of Joint Nature Conservation Committee (JNCC), Scottish Government, NatureScot and Scottish Environment Protection Agency (SEPA).

361. Furthermore, paragraph 14 of **Section 2**, **Volume 3 - Screening** of the NIS explains that pollution prevention measures are incorporated in the design of the project not with the aim of reducing the negative effects of that project on a given site, but as standard features required for all projects of the same type. Therefore, it is considered that pollution prevention controls are suitably built into the design of the project in order to meet existing legislative obligations, and accordingly, risk of pollution events is reduced as far as is reasonably practical. Potential for LSE is thus screened out accordingly for all European sites alone and in-combination with other plans and projects.

2.8.11 Item 8j - Terminology

'The Commission notes that inappropriate descriptions for potential effects/pressures are presented in the NIS Volume 3 (Screening) (e.g., Section 2.1 Table 2-1).

In the NIS for Benthic and Intertidal Ecology, 'Direct impacts on habitats' considers direct physical habitat disturbance and/or loss. However, this listed impact, should instead be split out into two different separate effect/pressure pathways. One that considers the impacts of temporary habitat disturbance and loss (e.g., during trenching), and another which considers long-term/permanent habitat loss (e.g., from installation of infrastructure on the seabed).

The applicant is therefore requested to review and re-assess Benthic and Intertidal Ecology, 'Direct impacts on habitats' for South Dublin Bay SAC in the NIS. Separate assessments should be undertaken regarding the effect/pressure pathway of temporary disturbance and loss, and also that of permanent loss. The applicant should also consider item 6(g)(iii) above in relation to this issue.'

Response

362. In response to Item 8j of the FIR, the Applicant has provided an updated screening assessment in **NIS Addendum (Part 1)** whereby separate assessments are provided for direct temporary impacts on habitats and long term habitat loss. No long-term permanent habitat loss will result in South Dublin Bay SAC from activities associated with the CWP Project. This is because no infrastructure with the potential to lead to permanent or long term habitat loss will be installed within an SAC.

363. Terminology has been provided in **NIS Addendum (Part 1)** to clarify this.

Sediment Contamination

2.8.12 Item 8k - Data

'The Commission notes that data available on sediment contamination has not been suitably presented and subsequently incorporated in the impact assessments in the EIAR.

i. Physicochemical sampling of intertidal sediments only included analysis for PSA. No contaminant sampling was undertaken for the intertidal areas. Proposed works at the landfall and in the intertidal area will include OCT and installation of a cofferdam as well as crossing of

pipelines/existing infrastructure, resulting in direct physical disturbance and re-mobilisation of these sediments. No secondary data (if available) are used to describe the contamination quality of these intertidal sediments.

Consultation on the baseline survey design and methodology had been agreed prior to surveying (NPWS and the MI, June 2021 (as summarised in Chapter 8 Table 8-1), however, it is not stated if there had been agreement over the collection of physicochemical data.

The applicant is therefore requested to provide further information on consultation undertaken in relation to collection of intertidal sediment quality data (see also Item 8(l) below).

ii. The survey data collected by Dublin Port Company (DPC) within the River Liffey (2022), that were used to characterise the baseline conditions, have not been adequately detailed. The applicant is therefore, requested to provide Dublin Port Company 2022 River Liffey sediment data and associated reports used to inform the baseline for Benthic and Intertidal Ecology.'

Response

364. **Section 8.2** of **Volume 3, Chapter 8 Subtidal and Intertidal Ecology** of the EIAR summarises the consultation feedback from key stakeholders on the benthic and intertidal survey approach and baseline data sources. Full details of consultation undertaken by the Applicant is presented in the Consultation Report (**Document No. CWP-CWP-CON-08-05-01-REP-0001**), which was submitted as part of the CWP Project planning application. Through this consultation process the Applicant agreed the survey scope and design with NPWS and the Marine Institute.

365. Not withstanding this, in response to Item 8k of the FIR, the Applicant has conducted an additional intertidal survey including sampling for contaminants, the results of which are provided in **Section 8.6** of the **EIAR Addendum (Part 1).** Relevant paragraphs of **Section 8.10** of the **EIAR Addendum (Part 1)** have been updated to reflect the additional baseline information and sediment modelling conducted in response to the Commission's FIR, to inform the assessment of the remobilisation of contaminated sediments in the intertidal area.

366. **Section 8.6.5** of **Volume 3, Chapter 8 Subtidal and Intertidal Ecology** of the EIAR presents the findings of the 2022 Dublin Port Company survey conducted in the River Liffey which found no contaminants at levels of concern, i.e. they are below lower Irish and Cefas Action levels. However, the Applicant provides further detail in the baseline assessment of **Section 8.6** of the **EIAR Addendum (Part 1)** on the Dublin Port Company survey conducted in the River Liffey. The report is referenced in **Appendix 8-B Landfall and Intertidal Survey Report 2025** of the **EIAR Addendum**.

367. The Applicant concludes that the additional baseline information on contaminants in the intertidal and River Liffey provided in **Section 8.10** of the **EIAR Addendum (Part 1)** validate the conclusions reached in **Section 8.10** of **Volume 3, Chapter 8 Subtidal and Intertidal Ecology** of the EIAR, which remain unchanged.

2.8.13 Item 8l - Remobilisation of Contaminated Sediments

'The Commission notes that the impact of 'Remobilisation of contaminated sediments' (construction and decommissioning phases) on Benthic and Intertidal Ecology is not adequately assessed in EIAR Chapter 8.

Section 8.5 (Assumptions and limitations) discusses that as no data are available on the sensitivity or recovery of benthic habitats, that the impact has been assessed using best available evidence from the literature and using the sediment plume modelling. However, in the impact assessment Section

8.10.1 (Paragraphs 260-261) it states: "Benthic habitats are not assessed for the impact of remobilisation of contaminant sediments under MarLIN / MarESA due to the current evidence being extremely limited or completely absent for these receptors (Tyler-Walters et al., 2023). Habitats present in the study area, which may be affected by remobilised contaminated sediments are therefore considered to have the same sensitivity to this impact as that of Impact 2: Temporary increase in SSC, as their response to deposition of sediment, in absence of evidence to the contrary, is considered analogous with that of their response to deposition of contaminated sediments. Given this, the sensitivity of the subtidal and intertidal benthic habitats to the remobilisation of contaminated sediments are considered to be negligible to medium."

While the Commission acknowledges that the spatial impact of remobilisation of contaminated sediments may be analogous to that assessed for 'Temporary increases in SSC', however, the sensitivity of the receptors to this impact is not. Where one is a chemical impact pathway, the other is physical, and with biota exhibiting variation in their tolerance to contamination. There is no evidence currently presented within the application documentation to support this assessment of sensitivity. In addition, the assessment of impact magnitude overall lacks detail. For example, there is no reference to any spatial variation in contamination levels of the sediments (e.g., between and within the River Liffey, and those sampled from the 8 stations within the offshore export OECC (Paragraph 264)).

The applicant is therefore requested to review and update the EIAR impact assessment for Benthic and Intertidal Ecology for the impact 'Remobilisation of contaminated sediments' for both intertidal and subtidal areas, as appropriate to account for potential differences in variation in magnitude.'

Response

368. In response to FIR item 8l, The Applicant has provided a revised assessment of the remobilisation of contaminated sediments within **Section 8.10** of the **EIAR Addendum (Part 1)**. This includes additional information on receptor sensitivity based upon published literature, and an updated assessment of impact magnitude which takes account of the recorded levels of contaminants within the offshore development area, following a validation survey undertaken in August 2025. Further detail on the type and level of contamination within the various areas of the offshore development area is presented in **Section 8.6** of the **EIAR Addendum (Part 1)**, which, in summary, notes that there are no contaminants at levels of concern (i.e. they are below lower Irish and Cefas Action levels) present within the PAB. The potential effect of remobilisation of contaminated sediments on the intertidal and subtidal receptors is considered to be Slight, and not significant. As such, this additional information validates the baseline characterisation and supports the conclusions reached in **Section 8.10** of **Volume 3, Chapter 8 Subtidal and Intertidal Ecology** of the EIAR.

Receptor Groups

2.8.14 Item 8m

'The Commission notes that the identification of, and groupings of Benthic and Intertidal Ecology receptors have not been adequately presented and suitably assessed in the EIAR. The Commission's concerns in this regard are set out below:

i. In EIAR Chapter 8 Section 8.6.6 (Identification of Receptors), it is not clear in Table 8-9 which receptors overlap the PAB and/or which are outside of it (e.g., within the 10km and/or 20 km buffer), and if any are representative of important features (e.g., Annex I habitats). Table 8-9 is described as listing those biotopes recorded from the site-specific surveys. However, 'Rock and

biogenic reef habitats' are listed, where no biotopes belonging to this broad group had been identified from within the PAB during such surveys.

The applicant is therefore requested to update EIAR Chapter 8 Table 8-9 to provide clarity on:

- *The relative location of different Receptor Groups within the Benthic and Intertidal Ecology Study Area; and*
- *Conservation importance (if relevant) for the Receptor Groups.*

ii. *Biogenic reef habitat is listed in EIAR Chapter 8 Section 8.6.6 (Identification of Receptors) Table 8-9, under 'Rock and biogenic reef habitats'. However, biogenic reef habitat has not been assessed within the impact assessment for any relevant secondary impact pathways. This habitat is predicted as present within the 10km predicted sediment plume extent (e.g., as represented by 'Circalittoral Rock and Biogenic Reef' and 'Infralittoral rock and biogenic reef' in Chapter 8 Figure 8.7). Whilst the Commission notes it has a limited extent within this 10km buffer, on a precautionary basis this habitat should be assessed for relevant secondary impacts (e.g., 'Temporary increase in suspended sediment concentrations').*

The applicant is therefore requested to include in the EIAR an assessment of secondary impacts on the receptor group 'Biogenic reef'.

Response

369. **Section 8.6** of **Volume 3, Chapter 8 Subtidal and Intertidal Ecology** of the EIAR provides a comprehensive baseline characterisation and identification of receptors for the study area (Array site, OECC, landfall and intertidal area, and River Liffey in **Sections 8.6.1, 8.6.2, 8.6.3, 8.6.4** and **8.6.5** respectively). **Table 8-9** provides a summary of all receptors identified. In response to FIR 8m (i) **Table 8-F** in **Section 8.6** of the **EIAR Addendum (Part 1)** has been updated to include a column which identifies the location of receptors. **Section 8.6.8** of **Chapter 8 Subtidal and Intertidal Ecology** of the EIAR provides a detailed baseline of habitats and species of conservation importance. The baseline characterisation has subsequently been validated through further surveys in 2025, as described above, and as detailed in **Section 8.6** of the **EIAR Addendum (Part 1)**.

370. Direct impacts only have the potential to effect receptors where there is overlap of the activity and the receptor e.g. in the Offshore Development Area, whilst secondary impacts e.g. 'Temporary increase in suspended sediment concentrations' may have the potential to impact receptors in the 10 km study area. Paragraphs 156 – 168 of **Section 8.10** of **Volume 3, Chapter 8 Subtidal and Intertidal Ecology** of the EIAR provide findings of sediment plume modelling and concludes that all receptors within the 10 km study area are considered to have the potential to be impacted by increased SSC.

371. Paragraphs 156 – 168 of **Section 8.10** of **Volume 3, Chapter 8 Subtidal and Intertidal Ecology** of the EIAR identifies the Annex I reef habitats within the 10 km area with the potential to be impacted by increases in SSC and sediment deposition, all of which are rock habitats. Wicklow Reef SAC was designated *inter alia* for *Sabellaria aveolata* biogenic reef however the NPWS Conservation Objectives Supporting document states that its presence was questionable states that the highly dynamic nature of the area is unlikely to support a stable biogenic reef (NPWS). As such, only rocky reef was assessed as no biogenic reef was known to be present within the potential 10km impact area.

372. In response to the Commission's FIR, the Applicant conducted a visual survey of the northern section of Wicklow Reef SAC, the findings of which are provided in **Section 8.6** of the **EIAR Addendum (Part 1)**. Whilst some transects surveyed were assessed as having attributes that could qualify as low resemblance *Sabellaria spinulosa* reef and some as having attributes that could qualify as low

resemblance stony reef, they are not within the predicted distances and direction of increases in Suspended Sediment Concentration (SCC) and sediment deposition (**Section 8.10** of the **EIAR Addendum (Part 1)**). As such, the conclusions of the assessment remain valid.

Electromagnetic Field Assessment

2.8.15 Item 8n

'The Commission notes that the assessment of risk from electromagnetic field (EMF) emissions in EIAR Chapter 8 does not align with that presented for Chapter 9 Fish and Shellfish Ecology.

EIAR Chapter 8 has not presented calculated/estimated values for magnetic field emissions. In Table 8-12 (a representative scenario summary) for 'Impact 4- Presence of EMF and/or temperature changes resulting from presence of electrical infrastructure', the parameters listed relate only to subsea cable lengths (km), minimum depth of cover (m), and voltages (kV).

Whilst the same parameters are presented in the equivalent table in Chapter 9, the impact assessment itself in Chapter 9 presents calculated values (Paragraphs 443-444). Chapter 8 should align where relevant with Chapter 9 for an assessment of risk from EMF.

The applicant is requested to review and update as required the impact assessment in the EIAR and NIS to ensure alignment with that presented for fish and shellfish ecology. The applicant is also requested to refer to the FI Request for Fish and Shellfish Ecology for review of calculated EMF values and assessment of worst case scenario for burial depth (m), and to bring those findings through for consideration/discussion within the relevant Chapter 8 assessments.'

Response

373. In response to item 8n of the FIR, the Applicant has provided additional information regarding the potential effects associated with electromagnetic fields (EMF). The comments received and information provided in response to fish, shellfish, and marine turtle ecology have also been considered for benthic ecology, to ensure consistency. The additional information is provided in **Section 8.10** of the **EIAR Addendum (Part 1)** and in the **NIS Addendum (Part 1)**.

374. In areas where the depth of cover (i.e. material over the buried cable) is not adequate, additional cable protection would be installed therefore maintaining separation between marine organisms and the cable surface. It should be noted that the majority of organisms in sediment do not exceed a burrowing depth of 0.2 m, with 95 to 99% remaining in the top 5 cm (Kingston, 2001).

375. The additional information provided in **Section 8.10** of the **EIAR Addendum (Part 1)** and **NIS Addendum (Part 1)** supports the magnitude of impact from EMF to the relevant benthic and intertidal ecology receptors being low, and therefore the conclusions in the EIAR remain unchanged.

Codling Bank

2.8.16 Item 8o

Whilst the Commission notes that Codling Bank is not a designated Annex I habitat, it is however, recognised as an important habitat in the region. The EIAR has not suitably considered this habitat and/or referenced relevant impact assessments for the bank (i.e. EIAR Chapter 6 – Marine Geology, Sediment and Coastal Processes). The Commission's concerns in this regard are set out below:

i. *Secondary Data - EIAR Chapter 8 has not cited a relevant survey report by AQUAFACT International Services Ltd (2012), produced for the NPWS (hereafter referred to as 2012 AQUAFACT). Whilst the survey data collected to inform the report is approximately 10 years old, this campaign had sampled those areas including Codling Bank, a feature which directly overlaps the PAB.*

   The applicant is therefore requested to review the 2012 AQUAFACT survey report to provide confirmation whether the data is suitable to further support the baseline, or if not required, provide rationale as to why it has not been considered.

ii. *Assessment of Codling Bank - The Commission notes that Greater Codling Bank is described as "not conforming to the morphotype" (of an Annex I Sandbank) (NPWS, 2019). Whilst not a qualifying/designated Annex I sandbank feature, there are notable omissions in EIAR Chapter 8 that relate to:*

   - *The spatial overlap of Codling Bank with the CWP PAB; and*
   - *The key characterising benthic habitats of Codling Bank.*

The Commission notes that EIAR Chapter 6 has considered Codling Bank, where it provides reference to the bank's stability in relation to sediment mobility and risk from impact. However, Chapter 8 has not included a cross reference to the assessment presented in Chapter 6, where a link between the risk to this geomorphological feature and therefore, risk to its supported benthic communities is important.

The applicant is therefore requested to review and update the impact assessment within Chapter 8 to provide suitable consideration of Codling Bank-associated benthic communities.

Response

376. The 2012 Aquafact survey report (Subtidal Benthic Investigations of the Greater Codling Bank, AQUAFACT International Services Ltd On behalf of The National Parks & Wildlife Service, October 2012) describes a benthic grab survey at 40 locations across the Greater Codling Bank. This included areas both within and outside the Planning Application Boundary. The survey found that the majority of the bank was made up of coarse sediments, dominated by gravels and cobbles.

377. Considering this data was over 10 years old at the time of application, and as the environment within the Planning Application Boundary is known to contain areas of strong hydrodynamic currents which can lead to changes over time in habitat extent and distribution, and as the Applicant had undertaken a comparable survey using benthic grab sampling methods equivalent to those described in the Aquafact (2012) report, it was considered that the more recent site specific data was the most suitable upon which to undertake the impact assessment on benthic ecology receptors.

378. It is worth noting that the area surveyed is dominated by coarse sediments, and therefore the Aquafact (2012) report provides additional evidence of the long-term stability of the coarse sediment habitats present, which validates the existing baseline presented in the EIAR.

379. As stated in item 8o of the FIR, Codling Bank is a geomorphological feature and therefore not a benthic ecology receptor. However, **Section 8.6** of **Volume 3, Chapter 8 Subtidal and Intertidal Ecology** of the EIAR provides a comprehensive baseline characterisation in which the benthic receptors identified include the same benthic communities found in Codling Bank. As such, the impact assessment provided in **Section 8.10** of **Volume 3, Chapter 8 Subtidal and Intertidal Ecology** of the EIAR does provide suitable consideration of Codling Bank-associated benthic communities.

380. Nonetheless, an update has been provided to **Section 8.6** of the **EIAR Addendum (Part 1)** summarising the type of benthic communities found at Codling Bank for clarity.

2.9 Item 9 Transboundary Consultation

2.9.1 Item 9a

'The Commission notes that the observation received by the Territorial Sea Committee on behalf of the Isle of Man, raises, inter alia, concerns in relation to the lack of consideration of designated Manx sites, with potential for transboundary impacts in particular in relation to birds, fish/shellfish, and marine mammals. The applicant is requested to fully address the Isle of Man observation. In responding to this item, the applicant is also requested to consider the potential for interaction of Temporary Threshold Shift (TTS) ranges with Manx waters and the conservation objectives of any protected sites therein (see also relevant items from item 10 below regarding consideration of TTS).'

Response

381. **Section 6.1** of the Applicant's **Observations Response Document** provides a full response to the matters raised by the Isle of Man Territorial Sea Committee.

382. The potential for Temporary Threshold Shift (TTS) to interact with relevant Manx protected sites, and result in *ex situ* impacts on relevant receptors within their natural range, is considered in the following documents;

- **Section 11** of the **EIAR Addendum (Part 1);**
- **Part 1** and **Part 2** of the **NIS Addendum;** and
- **CEA Report (Part 2)**.

The updated assessments inclusive of further mitigation as detailed in the updated **MMMP**, conclude that there are no significant effects at Manx protected sites, and no impediment to Conservation Objectives being achieved.

2.10 Item 10 Marine Mammals

Underwater Noise

2.10.1 Item 10a - Noise Abatement

The details that have been submitted in relation to underwater noise arising from the proposed development acknowledges the potential for impacts to arise on marine fauna from both Permanent Threshold Shift (PTS) and TTS over significant areas. The Wildlife Act 1976, as amended, lists marine mammals, including all dolphin, porpoise, seal and whale species as protected (with subsequent regulations also applying protections to all species of marine turtles and similar protections to basking sharks), stating that it is an offence to hunt, injure, or wilfully interfere with/destroy the resting or breeding place of such species. The January 2014 'Guidance to Manage the Risk to Marine Mammals from Man-Made Sound Sources' published by the Department of Arts, Heritage and the Gaeltacht (NPWS, 2014), notes that sound sources with the potential to induce TTS in a receiving marine mammal has the potential to cause both disturbance and injury. This guidance has a statutory basis

under Regulation 71 of SI No. 477 of 2011 and refers to the "offence to injure" under the Wildlife Act, 1976, noting that TTS "may constitute such an injury".

Having regard to the information submitted in the EIAR, the NPWS underwater noise guidelines (NPWS, 2014), the strict protections afforded to marine mammals under the Wildlife Act 1976, as amended, in addition to submissions from prescribed bodies and observers, the Commission requires a formal commitment to inclusion of one or several of the suite of noise abatement measures referenced in the planning documentation, including commitment to their inclusion in the project. The applicant is requested to submit:

i. *Realistic values for the reduction in sound level possible from the suite of presented appropriate noise abatement measures, based on existing available technologies that could be applied to the proposed development to reduce/restrict the propagation of noise through the marine environment. The review must set out in detail the suitability of such measures for the construction of the proposed development at this location, including restrictions in relation to their suitability, where relevant.*

ii. *The applicant must also consider and draw on the best available technology and thresholds, including as applied in other EU jurisdictions (e.g., Germany; Belgium; Netherlands; Denmark), to identify and provide for suitable noise abatement to reduce the level and extent of potential noise impacts arising from the proposed development. Examples include the German 160 dB re 1 µPa²s SELss and 190 dB re 1 µPa SPLpeak thresholds that must not be exceeded at a distance of 750 m from a piling site; or the frequency weighted SELcum PTS thresholds (e.g., harbour porpoise 155 dB re 1µPa2s) that must not be exceeded for a fleeing animal with a starting distance of 200m in Denmark.*

iii. *Revised noise modelling and mapping which provides detailed consideration of the noise abatement strategy selected in response to (i) above and include:*

    1. *The modelled SPLpeak and SELcum PTS and TTS contours, for each functional hearing group potentially present, emanating from the existing locations proposed in the application, which are at the periphery of the proposed development, to demonstrate the full potential spatial extent of underwater noise propagation. Modelling must also show the noise level (SPLpeak, SELcum) at 750m from the locations of each of the piling activities selection.*
    2. *The modelled SELss contours for 120-180 dB re 1 µPa2s at 5 dB increments at the locations in the point above. Mapping provided must show the relevant noise contours in the context of implementing the abatement technologies/ measures identified at (1) above, and should be displayed alongside the noise contours in the absence of any such noise abatement measures being implemented.*
    3. *Revised details showing the change in total impacted individuals of each species before and after consideration of noise abatement technologies.*
    4. *Modelling must be performed for monopiles and pin piles, as both are under consideration within the project design envelope.*
    5. *Any additional abatement and/or mitigation measures should also be considered in the context of their potential for reduction of cumulative effects with other projects in terms of underwater noise.*

Response

383. In response to Item 10a and Item 10a Point iii(1), the Applicant has provided TTS modelling for pile driving, which is presented in **Appendix 9-C Underwater Noise Modelling Assessment** of the **EIAR Addendum.** A summary of the TTS-onset modelling results is provided in **Appendix L-TTS modelling**

outputs of this **FIR Response Document**. The Appendix provides TTS-onset impact ranges (m), impact area (km^2) and number of animals within the impacted area, using the NMFS (2024) TTS-onset thresholds and assuming a limit on underwater noise of 169 dB $L_{E,p,ss,05}$ at 750m (see below). However, it is the opinion of the Applicant that TTS assessed at the TTS-onset level does not constitute injury and that predicted TTS-onset ranges should not require mitigation. This position is fully detailed in the SMRU Consulting TTS Position Statement, 2025 available in **Appendix 11-B SMRU Consulting TTS Position Statement**, and summarised here:

- Whilst there is a lack of legal and regulatory consensus regarding the definition of 'auditory injury', most countries do not consider TTS to be auditory injury.
- TTS represents a short-term reduction in hearing sensitivity, typically recovering within an hour for small shifts (4–5 dB). [TTS at the currently defined onset threshold, does not lead to tissue damage and thus is not physical injury].
- TTS effects from pile driving have been shown to be frequency-specific (e.g. 4-8 kHz in harbour porpoises). As such, their impact on marine mammal biological functions (communication, predator/prey detection) is currently considered to be limited.
- Current TTS-onset thresholds (NMFS, 2024) are based on the smallest measurable changes in hearing, not on levels likely to cause functional impairment. These thresholds were originally developed to support estimations of PTS-onset, not to serve as regulatory thresholds for ecologically significant impact.
- What level of threshold shift might be considered biologically meaningful is currently unknown, and no biologically meaningful TTS thresholds have been established.
- TTS predictions based on SEL_{cum} are highly conservative as they omit: (i) the potential for TTS recovery between pile strikes or during breaks in pile driving, and (ii) distance-related effects on the impulsive characteristics of the sound. These factors likely lead to overestimations of impact ranges.
- Until there is sufficient scientific evidence to indicate a level and duration of TTS that may have a biologically meaningful effect on individuals, it is more appropriate to focus environmental impact assessments on PTS (as true auditory injury) and behavioural disturbance (e.g. disruption to foraging or migration).

384. It is also noted that the National Marine Fisheries Service (2024) guidance differentiates between “auditory injury” and “TTS”. Where TTS is defined as:

> *“A temporary, reversible increase in the threshold of audibility at a specified frequency or portion of an individual’s hearing range above a previously established reference level (ANSI 1995; Yost 2007). Based on data from cetacean TTS measurements (see Southall et al. 2019 for a review), a TTS of 6 dB is considered the minimum threshold shift clearly larger than any day-to-day or session-to session variation in a subject’s normal hearing ability (Schlundt et al. 2000; Finneran et al. 2000; Finneran et al. 2002)”*

385. and auditory injury is defined as:

> *“Damage to the inner ear that can result in destruction of tissue, such as the loss of cochlear neuron synapses or auditory neuropathy (Houser 2021; Finneran 2024). Auditory injury may or may not result in a permanent threshold shift (PTS).”*

386. In response to Item 10a and Item 10a Points i, ii, and iii (2 – 5), and as detailed in the updated **MMMP** submitted with the FIR response, to mitigate potential impacts from underwater noise during the construction of the project, the Applicant commits to a limit on underwater noise of 169 dB $L_{E,p,ss,05}$ at 750m at WTG and OSS piling events, and the implementation of noise abatement in the event high order Unexploded Ordnance (UXO) clearance is required. As detailed below, that commitment is supported by assessment that demonstrates that such reduction is feasible for the project using existing technology. However, given the rapidly evolving methods, in order to avoid a scenario where

it might be precluded from using technologies that may be most suitable at the time of pile driving construction activities, the Applicant cannot commit to a specific noise abatement technology at present.

387. As requested, a review of realistic noise-reduction levels achievable through currently available technologies is provided in the updated **MMMP**. This review demonstrates that multiple technologies are capable of delivering effective noise abatement outcomes. At this stage, it is not feasible to commit to a single commercial provider or a single technology. The review contained in the **MMMP** is considered to satisfy the Commission's requirements set out in the FIR, including the expectation of a formal commitment to adopting one or more of the noise-abatement measures referenced in the planning documentation and to their incorporation into the project.

388. In response to Item 10a, Point iii, the Applicant has provided revised noise modelling and mapping in **Chapter 11, Section 11.10 Impact assessment, Impact 5: Auditory injury (PTS) from piling – WTGs and OSSs** and **Impact 6: Disturbance from piling – WTGs and OSSs,** and in **Appendix 9-C Underwater Noise Modelling Assessment** of the **EIAR Addendum (Part 1)**. This includes:

- The modelled (instantaneous and cumulative PTS and TTS contours, and disturbance (SEL_{ss}) contours for each functional hearing group both with and without noise abatement mitigation. This has been conducted using the new NMFS (2024) guidance on PTS and TTS thresholds which now supersedes Southall et al (2019) (as was used in the EIAR application). Note, this has been conducted for monopiles only as the project design envelope does not include pin piles. Note: TTS contours for piling are presented in **Appendix 9-C Underwater Noise Modelling Assessment** of the **EIAR Addendum**.
- Modelled predicted noise level (SPL_{peak}, SEL_{cum}) at 750 m from each location.
- Mapping to show the noise contours (SEL_{ss}) both with and without noise abatement mitigation.
- Revised results showing the change in total impacted individuals of each species both with and without noise abatement mitigation.
- Additional abatement and/or mitigation measures, considered in the context of their potential for reduction of cumulative effects with other projects in terms of underwater noise.

389. In response to Iten 10a point ii, consideration has been given to the best available technology and thresholds, including as applied in other EU jurisdictions. This is presented in **Appendix 9-C Underwater Noise Modelling Assessment** of the **EIAR Addendum**.

2.10.2 Item 10b - Abatement Experience

'The Commission acknowledges the applicant's experience in offshore renewable projects in both the North Sea and other jurisdictions. The applicant is invited to submit any details or monitoring/reporting available from previous experience of offshore development in other EU jurisdictions which demonstrates the efficacy of mitigation measures adopted (and proposed in the current application) in relation to underwater noise.'

Response

390. EDF Power Solutions (50% owner of Codling Wind Park) has significant experience delivering offshore wind projects using monopile foundations, including Saint Nazaire and Courseulles sur Mer OWFs (under construction) in France and Teesside OWF in the UK. At Saint Nazaire and Teesside monopiles were installed using percussive piling, consistent with the approach proposed for the CWP Project. These projects did not require additional noise abatement systems, however, ramp up (soft start) procedures were implemented and works were subject to active environmental monitoring by marine

mammal observers and compliance reporting to the regulators in accordance with consent requirements.

391. Compliance reports, demonstrating the efficacy of, and compliance with, the mitigation required for piling at Teeside, and UXO for EDF Power Solutions Neart na Gaoithe OWF are available through The Crown Estate Marine Data Exchange[6] and Scottish Government[7] websites.

392. The CWP Project team includes personnel with direct experience of offshore wind projects where noise abatement for monopile installation was required, including Veja Mate OWF and Deutche Bucht OWF in Germany. Monopile foundations at both of these projects were installed using a combination of noise reduction systems, including bubble curtains and Hydro Sound Dampers. Furthermore, personnel on the CWP Project are experienced in monitoring compliance with piling mitigation strategies during piling operations (including marine mammal observers, Passive Acoustic Monitoring (PAM), acoustic Deterrent Devices (ADDs), soft starts and break procedures) and ensuring appropriate reporting to the regulators (e.g. Beatrice OWF in Scotland, Dogger Bank OWFs in England). Noise abatement systems themselves will be delivered by specialist sub-contractors (as outlined in **Appendix A** of the updated **MMMP**) under the oversight of the CWP Project and their Transport and Installation Contractors. The procurement process will ensure that suitably experienced and competent contractors are engaged with proven capability in monopile installation within specific noise constraints, and the execution of appropriate noise abatement measures.

393. The project advisers, Subacoustech and SMRU, have experience across multiple geographies, projects and authorship of guidance. The team at SMRU Consulting has extensive experience in advising on the choice of the most appropriate NAS to offshore developers. SMRU Consulting authored a number of comprehensive literature reviews, where the efficiency of noise abatement systems was evaluated but also analysed the real world data collected at offshore wind farms to validate model predictions of noise levels and impact ranges and assess the effectiveness of chosen NAS (Verfuss *et al.*, 2019, Brown *et al.*, 2023, Brown *et al.*, 2025a, Brown *et al.*, 2025b).

394. Further to the above, the Applicant notes that as per the response to FIR Item 10a, the project is not able to commit to a specific noise abatement technology at this time. The Applicant has instead provided an appraisal of a number of different technologies in **Appendix A** of the updated **MMMP** and has confirmed that in advance of construction the detailed approach, including any details that may be applicable for a noise abatement technology, will be made available.

2.10.3 Item 10c - Marine Mammal Mitigation Plan

'The MMMP states the development will follow standard NPWS (2014) guidelines, however it describes the use of Passive Acoustic Monitoring (PAM) as a form of mitigation under hours of darkness. The guidelines state: "Pile driving activities shall only commence in daylight hours where effective visual monitoring, as performed and determined by the MMO, has been achieved. Where effective visual monitoring, as determined by the MMO, is not possible the sound-producing activities shall be postponed until effective visual monitoring is possible". The following text is also noted: "Once an appropriate and effective Ramp-Up Procedure commences, there is no requirement to halt or discontinue the procedure at night-time, nor if weather or visibility conditions deteriorate nor if marine mammals occur within a 1,000 m radial distance of the sound source, i.e. within the Monitored Zone". According to standard practice, there is no requirement for piling to stop once daylight fades, however if there is a break in pile driving sound output for a period greater than 10 minutes (e.g., due to

6 https://www.marinedataexchange.co.uk/details/TCE-2041/2013-pmss-teesside-comparison-with-the-2009-compliance-report

7 UXO Underwater Noise Monitoring Report - Neart na Gaoithe Offshore Windfarm (Revised Design), Firth of Forth | marine.gov.scot

equipment failure, shut-down or location change), the piling must not resume until daylight hours. Although the proposed development will be able to employ PAM to aid in identifying the presence of cetaceans, to begin before daybreak would constitute a deviation from the NPWS (2014) Guidance. As per NPWS (2014) Guidance, PAM may be used as a supplementary mitigation tool to optimise marine mammal detection, but not as a primary mitigation tool. Additionally, pile driving under the guidance shall not commence if marine mammals are detected within a minimum 1,000 m radial distance of the source. The applicant is requested to clarify the relevant mitigation measures to be utilised, bearing in mind these guidelines.

It is further requested that all elements of the MMMP comply with NPWS (2014) Guidance (or any such updated guidance that issues in the interim) including: soft start times, delay durations, mitigation zone sizes, and mandatory ramp-up procedures, and defined reporting requirements. Furthermore, the use of distance estimation formula should follow the same approach suggested for distance estimation by the Joint Nature Conservation Committee (JNCC) (refer to Marine Mammal Observer Association article on the subject of distance estimation using reticular binoculars for further explanation) and use standard trigonometric equations for calculation.'

Response

395. In response to Item 10c, the Applicant has updated the **MMMP** to comply with NPWS (2014) guidance (also referred to as DAHG 2014). It is noted that no updated guidance has been issued in the interim and that the **MMMP** may require further updates post-consent to comply with any new guidance available in the future and at the time of construction.

2.10.4 Item 10d - Temporal Mitigation

'The applicant is requested to address the possibility for temporal mitigation, for example limiting piling to periods that do not overlap with the harbour or grey seal pupping season or the harbour porpoise calving season, to further limit effects on nearby Special Areas of Conservation (SACs).'

Response

396. The NIS and **NIS Addendum** have identified no adverse effects on the integrity of SACs that need to be addressed with temporal mitigation or otherwise.

397. In response to Item 10d, and with respect to seals and the proposed measure of temporal restriction to avoid overlap with seal pupping seasons, it is noted that both harbour and grey seal pupping occurs on terrestrial or intertidal haul-out sites rather than in the marine environment where piling activities would occur. As such, the risk of direct disturbance to pupping females and/or dependent pups from underwater noise associated with piling is considered to be very low, and thus the NIS concludes no AESI. Given this spatial separation between pupping habitats and the proposed works area, the imposition of seasonal restrictions on piling to avoid seal pupping periods would not provide additional meaningful mitigation benefit. Instead, mitigation measures focusing on acoustic impact reduction (e.g., a maximum noise limit, and real-time marine mammal observation and exclusion zones) are considered to be more effective and proportionate to the potential risk. Therefore, temporal restrictions for the purpose of avoiding overlap with seal pupping periods are not considered necessary. The Applicant remains committed to implementing appropriate mitigation measures to reduce underwater noise exposure for all marine mammal species potentially present in the vicinity of the works, consistent with best practice and guidance under the NPWS (2014) Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters.

398. With regards to harbour porpoise, the **NIS Addendum (Part 1)** has concluded that there is expected to be no significant disturbance effects to any harbour porpoise SACs and thus no AESI. The Applicant remains committed to implementing appropriate mitigation measures to reduce underwater noise exposure for all marine mammal species potentially present in the vicinity of the works, consistent with best practice and guidance under the NPWS (2014) Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters.

2.10.5 Item 10e - Geophysical Surveys

'Chapter 11, paragraph 50, of the EIAR states that 'a high level assessment of the noise impacts from other construction (i.e., excluding impact piling and Unexploded Ordnance (UXO) clearance) is presented in Appendix 9.4 UWN Assessment. This includes an assessment of the potential PTS and/or TTS onset impact ranges for: - geophysical surveys: geophysical survey equipment including but not limited to multi-beam echosounders, sub-bottom profilers, side scan sonar etc)…." However, Appendix 9.4 makes no reference to any pre-construction surveys methodologies or equipment being included in the assessment.

It is noted that Appendix 9.4 does include a brief consideration of other construction activities, and that there is an assessment of impacts from pre-construction geophysical equipment within Section 11.10.1 (also summarised within the MMMP). The applicant is therefore requested to provide further clarification or justification for the apparent lack of presentation of the noise impacts from geophysical surveys within Appendix 9.4.'

Response

399. The Applicant apologises for this error in transcription. **Appendix 9.4 Underwater Noise Assessment** of the EIAR was not supposed to be referenced in paragraph 50 of **Volume 3, Chapter 11 Marine Mammals** of the EIAR as **Appendix 9.4** does not contain underwater noise modelling for geophysical surveys.

400. In response to Item 10e, the Applicant has revised the assessment of impacts from pre-construction geophysical equipment in the **EIAR Addendum (Part 1)** (see Section 11.10 Impact 2: Disturbance from pre-construction surveys**)** in light of new guidance on disturbance impact ranges (JNCC, 2025). No underwater noise modelling has been conducted in the underwater noise modelling appendix of the **EIAR Addendum** (**Appendix 9-C Underwater Noise Modelling Assessment**) for PTS from geophysical surveys as the injury ranges are expected to be very small (a few meters) and will be mitigated through the **MMMP**. Underwater noise modelling was not required for disturbance from geophysical surveys since the use of set Effective Deterrent Ranges (EDR) doesn't require underwater noise modelling to be used.

2.10.6 Item 10f - Pile Driving Assessment

'The applicant is requested to provide further detail on the physical parameters (for example seabed characteristics) that differentiate the three different regions/piling scenarios (Chapter 11, Paragraph 141 of the EIAR). The applicant is also requested to confirm and justify the approach taken to differentiate between the three scenarios, from the data in table 11-15 the Commission assumes that the most restrictive scenario provides the least number of high-energy strikes albeit there is a higher number of overall strikes per pile, however, this is not stated clearly in the text.'

Response

401. The three piling scenarios referred to in **Volume 3**, **Chapter 11 Marine Mammals**, paragraph 141 of the EIAR were defined to represent distinct installation conditions across the site, differentiated by ground parameters and water depth, that materially influence pile drivability and underwater noise emission.

402. The scenarios were developed by industry leading consultant engineers using an integrated assessment incorporating geophysical and geotechnical site investigation data, foundation design, pile drivability analysis, and underwater noise modelling. This has led to a robust approach to developing piling scenarios based on site specific data, including ground conditions and bathymetry. The process is summarised below:

- Geotechnical site investigation (2023) provided site-specific soil parameters and formed the primary basis for defining representative ground profiles used in pile drivability assessments.
- Geophysical site investigation (2021) enabled extrapolation and validation of geotechnical parameters across the site, confirming the spatial applicability of representative ground profiles within each region.
- Detailed foundation design for Layout Option A and Layout Option B WTGs, incorporating geotechnical and environmental conditions, WTG operating parameters and fabrication and installation supply chain engagement.
- Underwater noise modelling sensitivity workshop identified spatial variability in noise propagation characteristics, including the influence of water depth to allow the site to be sub-divided into regions with broadly similar acoustic response.
- Pile driving analyses were undertaken using representative ground profiles and performed in collaboration with experienced hammer contractors, utilising current available technology to determine expected hammer energy ranges, blow counts and penetration behaviour for each scenario.
- Iterative refinement, incorporating additional conservative assumptions for ground conditions, was carried out through further coupling of pile drivability assessments and underwater noise modelling, resulting in the final three piling scenarios presented in the application.

403. The Applicant confirms that the Commission's assumption on the most restrictive piling scenario is correct. The most restrictive scenario has a long ramp up through hammer energies to remain within the maximum underwater noise limit of 169 dB $L_{E,p,ss,05}$ at 750m at WTG and OSS piling events, and thus resulting in the highest overall pile blows per pile.

2.10.7 Item 10g - Minke Whale Swim Speed

'It is noted that the Blix and Folkow (1995) 3.25 m/s 'constant fleeing speed' for minke whale has been used rather than the 2.1 m/s value which is recommended in Scottish Natural Heritage, 2016, 'Assessing collision risk between underwater turbines and marine wildlife, SNH guidance note', and which could be considered industry standard practice. While it is noted that the 2.1 m/s speed is based on 'routine swimming' (not fleeing), it does represent a more precautionary approach. If the applicant considers it is more appropriate to use the fleeing speed, they are requested to provide evidence that minke whale are likely to/capable of sustaining this speed across the entire distance travelled during displacement. Alternatively, the applicant is requested to use the 2.1m/s value in a revised assessment of this impact pathway.'

Response

404. In response to Item 10g, the Applicant would like to highlight that the assessment for cumulative PTS for minke whales presented in **Volume 4, Appendix 9.4 Underwater Noise Assessment** and **Impact 5: Auditory injury (PTS) from piling** in **Volume 3, Chapter 11 Marine Mammals** of the EIAR used a minke whale swimming speed of 3.25 m/s based on Blix and Folkow (1995). This swimming speed is described in Blix and Folkow (1995) as a "*commonly observed (upper) cruising speed of minke whales*". This means it is considered to be a typical swimming speed for this species, and not a fleeing speed. The Applicant highlights that this routine swimming speed is the industry standard practice in England and Wales. While the SNH (2016) advice is a mean swimming speed of 2.1 m/s (which is the lower end of the routine speeds reported by Williams (2009) which states routine speeds of 2.1-2.6 m/s), NatureScot have acknowledged that the SNH (2016) recommended swimming speed is less than that used in England and Wales. As such, recent assessments for cumulative PTS in Scottish waters have presented both 2.1 m/s and 3.25 m/s swimming speeds (for example, see the Inch Cape Offshore Wind Farm Piling Strategy - Generating Station (PS-GS)[8] which presents both swimming speeds, acknowledging that the 2.1 m/s is low). Across EIAs in UK waters, minke whale swimming speeds used in underwater noise modelling has varied between 2.1 m/s, 2.3 m/s and 3.25 m/s.

405. It should be noted that neither 3.25 m/s nor 2.1 m/s is considered to be a *fleeing* speed. There are records of higher fleeing speeds for minke whales in response to ADDs (4.19 m/s, McGarry et al., 2017), however, there is no evidence that these fleeing speeds could be sustained for hours during the piling activity and in a highly directional manner, as is currently assumed in the cumulative PTS (SEL_{cum}) modelling. Therefore, these higher fleeing speeds were not included in the assessment.

406. The revised underwater noise modelling in **Section 11.10** (Impact 5: Auditory injury (PTS) from piling – WTGs and OSSs) and **Appendix 9-C Underwater Noise Modelling Assessment** of the **EIAR Addendum (Part 1)** uses a minke whale fleeing speed of 3.25 m/s. This is consistent with the Phase 1 EIARs for Dublin, NISA, and Arklow Bank Phase 2, all English EIARs, the Isle of Man Mooir Vannin EIAR and various Welsh EIARs (including Awel y Mor and Erebus).

2.10.8 Item 10h - Piling Events Contingency

'The worst-case number of piling events does not account for the contingency of having to move and re-pile if substrate does not accept the pile. The applicant is requested to add in this consideration or provide justification for its exclusion from the worst-case scenario. Furthermore, the applicant is asked to confirm that the construction piling approach and assessments submitted consider the projected worse-case scenario, in this regard the Commission notes that the total hours of piling per monopile used within the EIAR for the Codling project presents as the lowest of the 5 Irish Sea Phase 1 ORE projects that are currently under consideration, and while it is acknowledged that conditions, techniques, and monopole diameters differ between all projects the applicant is requested to provide further justification confirming their approach and/or provide additional details/discussion within the relevant assessments.'

Response

407. The applicant confirms that, in the event of pile refusal, monopiles would not be cut, removed and re-piled at an alternative location. Pile refusal is defined as a condition where a specified number of hammer blows does not achieve the expected penetration and continued driving could risk damage to

[8] https://marine.gov.scot/?q=node/27094

the pile. Should this occur, the established mitigation approach is relief drilling, whereby material inside the pile and, where necessary, localised obstructions beneath the pile (e.g. boulders) are drilled out, as described in **Section 4.6.2** (Installation Option 2 – Monopile drilling) of EIAR **Volume 2**, **Chapter 4 Project Description**. The implications of drilling, following a pile refusal, has been considered in **Volume 4, Appendix 11.2 Representative Scenario and Limits of Deviation Assessment** of the EIAR. This notes that drilling would not introduce any materially different level of magnitude that have not already been considered as part of the assessment, nor introduce any new impact receptor pathways in regards of noise / vibration that have not already been considered as part of the assessment.

408. Further site investigation, detailed ground modelling and bespoke foundation design will be undertaken in advance of construction to minimise the likelihood of pile refusal and to ensure that any refusal encountered can be effectively managed through relief drilling.

409. The applicant can confirm that the construction piling approach and the assessments presented within the EIAR have been developed to represent a robust worst-case scenario. The methodology and assumptions, as further explained in the response to item 10f, demonstrate that suitably conservative and proportionate worst-case parameters have been applied within the assessments. For example, in the case of the marine mammal assessment (see EIAR Addendum), the temporal representative scenario assumes installing 1 pile per day, as it leaves the necessary contingency in case a pile needs to be moved. This assumption was applied in the population modelling for both the EIAR and the **EIAR Addendum**. The Applicant is therefore confident in the piling scenarios developed for the CWP Project, and that they incorporate an appropriate level of contingency to support robust impact assessments and conclusions beyond reasonable scientific doubt.

2.10.9 Item 10i - Figure Updates

The applicant is requested to provide the following updated maps within a separate appendix:

i. Contours of injury threshold exceedance (including TTS) and dose-response contours (where appropriate) for all modelled scenarios.

ii. Maximum masking and behavioural impacts in the Cumulative Effects Assessment (CEA; Appendix 11.1) on marine mammals and fish, and behavioural impacts for shellfish. The CEA should model impacts based on concurrent construction with and without noise abatement with the closest currently proposed ORE developments in the Irish Sea (i.e., the Dublin Array and Arklow Bank Wind Park 2). See Item 10(a)(iii) above for further context.

Response

410. In response to Item 10i, Point i, revised noise modelling and mapping illustrating PTS and TTS contours are provided in **Appendix 9-C Underwater Noise Modelling Assessment** of the **EIAR Addendum**. Note that while TTS contours for piling are presented in the underwater noise appendix (*ibid*), it is the Applicant's position that TTS does not constitute injury (see response to 10a above).

411. The modelling location with the worst case dose-response function is location SE, therefore, the dose-response contours and level B contours for the SE location are provided in maps in **EIAR Addendum, Section 11.10** (Impact 6: Disturbance from piling – WTGs and OSSs) for each marine mammal species. Other modelling locations resulted in lesser impact so are not presented in maps in the **EIAR Addendum.**

412. In response to Item 10i, Point ii, there are currently no industry standard marine mammal masking thresholds established in either Ireland, the EU or the UK. The lack of established thresholds means

a direct relationship between noise levels and masking is difficult to quantify, and as such, this cannot be explicitly modelled or assessed in the EIAR. Auditory masking can be defined as *"the process by which the threshold of hearing for one sound is raised by the presence of another (masking) sound; and the amount by which the threshold of hearing for one sound is raised by the presence of another (masking) sound, expressed in dB"* (American National Standards Institute, 1995).

413. The extent of auditory masking caused by anthropogenic activities is dependent on the characteristic of noise emissions, the source levels of biologically important sound sources such as prey or calling conspecifics, the rate of propagation loss and the absolute hearing sensitivity of the listener as a function of sound frequency (Pine et al., 2018). Scientific evidence available in the public domain suggest that more research is needed to better understand the mechanisms of auditory masking in marine mammals (Erbe et al., 2016, Erbe et al., 2019, Branstetter and Sills, 2022). Erbe et al. (2016) carried out a thorough review of the evidence available to masking , including various methods applied to date in an attempt to evaluate masking and highlighted that predicting masking is complex and difficult given the variety of factors that must be accounted for (including but not limited to data on audiograms, critical ratios and critical bandwidths). Branstetter and Sills (2022) also noted that predicting masking is inherently complex due to the spectral-temporal properties of signals and the spatial relationships among sound sources.

414. Auditory masking in marine mammals has gathered attention in recent years and there are new and ongoing studies to fill these data gaps in the coming years (Jones, 2024, Burnham and Vagle, 2025, Sills et al., 2025, Dunlop et al., 2026). However, given the lack of relevant threshold criteria and/or the availability of modelling tools to enable a quantitative assessment for masking, such evaluation cannot be carried out currently. Behavioural disturbance to marine mammals as a result of underwater noise during geophysical surveys, UXO clearance, piling, vessels and other construction activities are assessed in detail within EIAR **Volume 3, Chapter 11 Marine Mammals** and **Section 11** of the **EIAR Addendum (Part 1)**. Although masking may have more far-reaching effects compared to behavioural disturbance, it is a more subtle interference of acoustic perception compared to behavioural disturbance, with studies indicating anti-masking strategies in a few species (Erbe et al., 2016). It is therefore considered that the effect concluded for masking would not be of greater magnitude and significance compared to behavioural disturbance and therefore there would be no change to the conclusions of the cumulative assessment presented in **Appendix 11.1** of the EIAR, and updated in the **CEA Report (Part 2)**.

415. The CEA in **Appendix 11.1 Cumulative Effects Assessment** of the **EIAR** for marine mammals has been updated to include a revised long list, revised screening and updated information on offshore developments (see **CEA Report (Part 2)**). This includes an assessment of disturbance impacts from pile driving from the Phase 1 projects, using both values published in their EIARs as well as assuming piling mitigation is implemented at each project.

Behavioural Disturbance

2.10.10 Item 10j - Geophysical Effective Deterrence Ranges

'Under Impact 2 (Disturbance from pre-construction surveys) of Section 11.10.1 it is stated that a disturbance range cannot be quantified for Ultra-Short Baseline, Sub Bottom Profiler, Ultra High Resolution Seismic Sparker and Sub-Bottom Imager due to lack of empirical evidence. The applicant is requested to justify their reasoning for not considering use of an Effective Deterrence Range (EDR) for this purpose and/or amend the assessment to provide for EDR.'

Response

416. In response to Item 10j, the Applicant notes that since the application was submitted, the JNCC have released new and better evidenced EDRs for geophysical survey equipment. The new JNCC (2025) recommended EDRs for harbour porpoise are:

- Sub Bottom Profilers (all types): 3 km
- Ultrasonic Baseline USBL: 3 km
- Multiple-transducer Single-Beam Echo Sounder (SBES) or Multibeam Echosounder (MBES) with an operating frequency of ≤12 kHz operating in waters ≤200 m depth: 3 km

417. These have been incorporated into the revised geophysical survey impact assessment in the **EIAR Addendum (Part 1)** (Section 11.10, Impact 2: Disturbance from pre-construction surveys). In the absence of specific guidance for other marine mammal species, these EDRs have been assumed for all marine mammals.

2.10.11 Item 10k - Level B Harassment Threshold

'The Commission notes the use of NOAA Level B Harassment Threshold (National Marine Fisheries Service, USA 2024) for the assessment of behavioural disturbance rather than more recently defined thresholds in European jurisdictions (e.g., Danish threshold of 143 dB re 1µPa or 103 dB re 1 µPa VHF-weighted) single strike sound exposure level (SELss) (Tougaard, 2021). The Commission further notes the threshold values recommended by TG Noise (Sigray et al., 2023) and thresholds used in Ireland's Draft Marine Strategy Part 1, Article 8, 9 and 10 report 2024 and its Annex III. The applicant is requested to consider these thresholds and justify why they have not been used in the assessment'

Response

418. In response to Item 10k, the Applicant notes that the assessment for disturbance presented in **Impact 6: Disturbance from piling** of **Volume 3, Chapter 11 Marine Mammals** of the EIAR used the level B harassment threshold for dolphin species and minke whales only, as there is no evidence that the harbour porpoise dose-response function is applicable to these species. The same applies to the European thresholds (143 dB re 1µPa or 103 dB Very High Frequency (VHF)-weighted) which are set specifically for harbour porpoise and not any other species of marine mammal. As the prediction of disturbance is difficult for species lacking empirical data, the assessment has been updated in **Section 11.4** of **EIAR Addendum (Part 1)** based on the following disturbance thresholds:

- Graham et al (2017) dose-response function for all cetaceans (with and without a limit on underwater noise);
- Whyte et al (2020) dose-response function for seals (with and without a limit on underwater noise);
- Level B harassment threshold for minke whales and dolphins (with and without a limit on underwater noise); and
- JNCC (2025) 20 km EDR for unabated monopiles and 11 km EDR for abated monopiles for all marine mammals.

419. The Applicant has also provided an analysis of MSFD criteria, through reference to Ireland's Marine Strategy for thresholds where applicable. The assessment is presented as **Appendix 1 - NMPF Compliance / MSFD Assessment** to the **Planning Report Addendum** and concludes that there is no impediment to Good Environmental Status being achieved.

2.10.12 Item 10l - Expert Elicitation Workshop

'Paragraph 337 in relation to Impact 6 (Disturbance from Piling – WTGs and OSSs) within Section 11.10.1 of Chapter 11 in the EIAR references the expert elicitation workshop (Booth et al., 2018) to discuss effects of disturbance from piling on marine mammals. In the workshop the attendees assessed the most likely potential consequences of a six-hour period of zero energy intake for harbour seals. The applicant is requested to present this workshop findings within the context of repeated periods of disturbance (over 78 days), rather than a single period.

The Commission notes that it is stated that it may take approximately 60 days of repeated disturbance before there is expected to be any effect on the probability of survival. As the total piling days exceed this value, the potential for effect should be set out and discussed within the EIAR. It is not considered adequate justification to note the uncertainty around this 60-day estimate, as this could result in either fewer or greater number of days of required repeat disturbance.

The applicant is requested to provide further data to support the following statement: "…it is considered unlikely that individual harbour seals would repeatedly return to a site where they had been previously displaced from in order to experience this number of days of repeated disturbance" (Paragraph 337, Chapter 11 of the EIAR). If repeated disturbance excludes seals from the site, barrier effects should be considered (particularly considering the large area of disturbance) within the EIAR. Alternatively, the applicant is requested to consider and discuss current research indicating high site fidelity in seals.'

Response

420. In response to Item 10l, the Applicant notes that the assessment provided in the of **Volume 3, Chapter 11 Marine Mammals** of the EIAR (Impact 6: Disturbance from piling), and in **EIAR Addendum (Part 1)** *does* account for the fact that there will be repeated days of disturbance, at a level which may result in changes to vital rates. While it is considered unlikely that individual harbour seals would repeatedly return to a site where they had been previously displaced from in order to experience this number of days of repeated disturbance, the iPCoD modelling *does* account for multiple days of disturbance by incorporating the total number of piling days (78) into the model. It is for this reason that iPCoD population modelling was conducted to investigate whether there was predicted to be a population level impact resulting from all pile driving days (both for the project alone and cumulatively with the Phase 1 projects).

421. It is noted that given the Applicants commitment to a limit on underwater noise of 169 dB $L_{E,p,ss,05}$ at 750m at WTG and OSS piling events, the predicted impact of disturbance from pile driving activity at CWP is to <1 individual harbour seal per piling day (see **Section 11.10** of the **EIAR Addendum (Part 1)** (Impact 6: Disturbance from piling – WTGs and OSS, Table 11.DD)).

2.10.13 Item 10m - Minke Whale Displacement

'The applicant is requested to provide supporting reference(/s) for the statement in Paragraph 330 of Chapter 11 of the EIAR which states that minke whales can "tolerate temporary displacement from foraging areas due to their large size and capacity for energy storage".'

Response

422. In response to Item 10m, the Applicant notes that this statement was intended to be relative to other marine mammals in the assessment such as harbour porpoise and dolphin species. However,

research suggests that minke whales' energy acquisition strategy on feeding grounds is to maximise energy intake (Christiansen et al., 2013) which makes them more resilient against temporary reductions in prey availability or habitat disruption (Gardiner et al., 2025). For example, minke whales in the Gulf of Saint Lawrence maintain reproductive stability through efficient energy storage and flexible foraging behaviour, enabling them to withstand environmental variability and temporary habitat or prey disruptions without significant reproductive decline (Gardiner et al., 2025). This information has been incorporated into the **EIAR Addendum (Part 1)** (see Section 11.10, Impact 6: Disturbance from piling – WTGs and OSSs).

2.10.14 Item 10n - Minke Whale Vessel Disturbance

'In the assessment of Minke whale sensitivity to repeat vessel disturbance (Paragraphs 468-470), the EIAR references a study by Christiansen and Lusseau (2015) that found no apparent potential for a population-level effect of acute disturbances from whale-watching vessels. However, the Commission notes that the number and frequency of transiting vessels during construction is likely to be far greater than the number of whale-watching vessels. Additionally, whales are likely to be exposed to boats throughout the day (12 hours), which the same study suggests would be sufficient to significantly affect foetal growth rate. The applicant is requested to provide further justification for the suitability of this study for a determination of low impact to minke whale from vessel disturbance.'

Response

423. In response to Item 10n, the Applicant notes that there are currently limited studies available regarding the effects of vessel disturbance on minke whales in general, and almost nothing about construction related vessel activity. When considering the impacts of whale watching vessels to those likely to occur from construction vessel activities, they cannot be directly transposed, as disturbance effects from whale watching are direct impacts, whilst those from construction activities are indirect, and the vessel types and underwater noise produced are very different. It was not the intention to compare whale watching vessels to construction vessels in the EIAR, but due to the lack of research on minke whale responses to OWF construction vessels, it was the most suitable example to use. The assessment provided in the EIAR is considered appropriate given the best available knowledge of minke whale responses to construction vessels, and given the low density of minke whales expected in the area (meaning this approach is adequately precautionary even in the absence of further information re construction vessels).

2.10.15 Item 10o - Operational Disturbance

'The applicant is requested to provide a detailed assessment of disturbance from operational turbines on marine mammals. The reference to Stöber and Thomsen (2021) is used to suggest a reduction in noise output between gear box versus direct drive turbines, however the paper still suggests that a modern 10 MW turbine would disturb marine mammals out to 1.4 km under the Level B Harassment threshold. In a subsequent case study, Thomsen et al. (2024) present TTS impact ranges from a 20 MW turbine of over 700m, indicating a potential overlapped impact area across the entire wind farm. This further then calls into question the assessment that the combined noise effect of all turbines can be determined to be negligible without further examination. The applicant is requested to address this issue amending the EIAR and, drawing in additional sources and discussion as necessary.'

Response

424. In response to Item 10o, the Applicant has included additional assessment and information to the underwater noise modelling (**Appendix 9-C Underwater noise modelling assessment** of the **EIAR Addendum**) and the **EIAR Addendum (Part 1)** (see Section 11.10 O&M Phase, Impact 2: Disturbance from operational noise).

425. **Appendix 9-C** provides detail on the sources considered when modelling operational WTG noise (including Stöber and Thomsen (2021), Tougaard et al. (2020), Holme et al. (2023) and Bellmann et al. (2023)). As stated in the underwater noise modelling report (*ibid*), both Holme et al. (2023) and Bellmann et al. (2023) show a lack of strong correlation with underwater noise output and WTG size; in fact the larger Bellmann et al. (2023) study shows that the smaller WTGs were actually slightly louder on average than their larger counterparts. This may be because of newer designs, and a move from gearbox to modern direct drive (gearboxless) designs, which are generally quieter. Additionally, Holme et al. (2023) indicated that the Tougaard et al. (2020) calculation (which is used for the CWP modelling) substantially overestimates the actual noise produced by the larger WTGs, in some cases by 8 dB, giving an extra level of conservatism for the estimations.

426. The underwater noise modelling (*ibid*) acknowledges Stöber and Thomsen (2021) but uses the equation from Tougaard et al. (2020) to estimate disturbance ranges of only 190 m (using the level B harassment threshold) from an operational WTG at the CWP Project (which is significantly smaller than the 1.4 km predicted by Stöber and Thomsen (2021)). As the distance between WTGs at the array site is expected to be much greater than 190m, any array effect from the WTGs is not expected.

427. The underwater noise modelling (*ibid*) predicts PTS and TTS impact ranges of <50m for both a 15 or 21 MW WTG assuming a stationary animal (which is negligible compared to the 700m predicted by Thomsen et al. (2024)). As stated in the underwater noise modelling (*ibid*), a marine mammal would need to remain within 50 m of the operational WTG for 24 hours to exceed threshold which is extremely unlikely. Given the small impact ranges (<50m), no array effect from the WTGs is expected. Additionally, the presence of species such as harbour porpoise, grey seal and harbour seal around bottom-fixed foundations has been widely documented (Scheidat et al., 2011, Russell et al., 2014, Delefosse et al., 2020, Fernandez-Betelu et al., 2024), indicating that they are not deterred by operational WTGs.

Annex IV Species

2.10.16 Item 10p - disturbance of Annex IV species

'The Commission notes the content of Appendix A 'Compliance with the National Marine Planning Framework' of the submitted Planning Report which states that in relation to marine mammals, 'even without causing significant residual effects the CWP project will result in disturbance of Annex IV species that requires a derogation licence under Regulation 54 of the Birds and Natural Habitats Regulations, 2011'. It is also stated that this derogation will be applied for close to the date of submission of the Planning Application. The applicant will be aware of the recent guidance from the Department of Housing, Local Government, and Heritage in relation to Regulation 54 Derogations which state that it is necessary for any derogation to be granted prior to a planning decision on the proposed activity. In this regard the applicant is asked to provide an update and any further details available on this matter and to consider any potential further derogation(s) which may be required in relation to any other annex IV species.'

Response

428. The Applicant can confirm it applied for a Regulation 54 Derogation (for Annex IV species) on 19 February 2026. The Derogation being sought relates to marine mammal disturbance. While some degree of disturbance is expected, it is not predicted to be of such an extent that it may affect chances of survival, breeding success or reproductive ability, or lead to a reduction in the occupied area or the relocation or displacement of the species. The assessments are presented within an Annex IV Risk Assessment and allow conclusions to be drawn that there will be no impediment to the Favourable Conservation Status (FCS) of marine mammal species being maintained. Whilst disturbance does not amount to disturbance for the purposes of Regulation 51, the possibility of an impact on marine mammal species cannot be ruled out, and accordingly, a derogation licence is currently being sought from NPWS. The licence application is included in the Applicant's FIR response pack for information.

429. While Renewable Energy Directive (RED) III has not yet been fully transposed into Irish law, it is clear that, once implemented, disturbance arising from a renewable project will not be treated as deliberate where appropriate mitigation measures have been applied. Accordingly, where the relevant provisions are transposed and the requirement for a derogation licence no longer applies, the Applicant will consider its derogation position once RED III is fully implemented.

Surveys and Baseline

2.10.17 Item 10q - Common Dolphin

'The Commission notes that in Figure 5-7 of Appendix 11.3 Baseline Technical Report, the seasonal differences presented do not match the observation records set out in Table 13 of the same document. The applicant is requested to review these figures and the table and to amend, clarify and confirm the correct numbers as necessary.'

Response

430. In response to Item 10q, the Applicant apologises for this transcription error. This has been amended in **Appendix 11-A Update to Marine Mammal Baseline Characterisation** of the **EIAR Addendum.**

2.10.18 Item 10r - Department of Communications Climate Action and Environment Guidance

'With reference to the Guidance on Marine Baseline Ecological Assessments and Monitoring Activities for Offshore Renewable Energy Projects Part 2, April 2018 by the Department of Communications Climate Action and Environment (DCCAE) (DCCAE Guidance, 2018), the applicant is requested to justify:

i. The selection of a 4km buffer area extending around the array area. The DCCAE Guidance, 2018 recommends a minimum buffer of 10km for cetaceans and seals, with monthly haul-out site surveys.

ii. The lack of empirical acoustic data, noting the Department of Housing, Local Government and Heritage, Development Application Unit (DAU) observation which states the omission of acoustic monitoring does not allow the site to be fully characterised for all Annex IV species.'

Response

431. In response to Item 10r, Point i regarding surveys utilising a 10km buffer around the array area, the Applicant has supplemented the previous vessel and DAS with additional DAS that covers a 10 km buffer of the array area (surveys completed between May 2025 – Nov 2025, see **Table 2**). These are detailed in **Appendix 11-A Update to Marine Mammal Baseline Characterisation** of the **EIAR Addendum.**

432. In response to Item 10r, Point i regarding monthly haul-out surveys, the Applicant has now conducted further monthly seal haul-out surveys at the landfall site between Jan 2025 – Jan 2026. These are detailed in **Appendix 11-A Update to Marine Mammal Baseline Characterisation** of the **EIAR Addendum.**

433. Both the DAS and haul out surveys are considered to demonstrate the validity of the characterisation presented in the application phase EIAR, and as such do not meaningfully change the basis for the existing assessment conclusions.

434. In response to Item 10r, Point ii, the Applicant disagrees that the lack of site-specific PAM data means the site cannot be fully characterised. In accordance with the Guidance on Marine Baseline Ecological Assessments & Monitoring Activities for Offshore Renewable Energy Projects, areas with robust existing data (such as the Irish Sea, based on publicly available evidence) require pre-construction marine mammal baseline characterisation through monthly field surveys conducted over a two-year period using an acceptable experimental design (DCCAE, 2018). The industry standard, e.g. what is usually included in the baseline EIA reports are digital aerial surveys (project-specific across the project area plus appropriate buffer) and desktop reviews of existing datasets (e.g., Small Cetaceans in European Atlantic waters and the North Sea (SCANS) surveys, SMRU data, telemetry and others). As such, current baseline characterisation for the CWP project aligns with the relevant guidance and industry standard. It should be also noted that in order to assess whether a development could result in a significant effect on marine mammal receptors, the EIAR characterises the receiving environment with regards likely receptors present, quantify (where possible) the number of individuals impacted through specific impact pathways, and establish whether the predicted level of impact is sufficient to result in a population level effect. To quantify potential impacts in terms of the number of animals impacted, it is necessary to know the density of a given marine mammal receptor within the impacted area. Thus, the primary purpose of the marine mammal baseline characterisation report is to identify the appropriate density, and abundance estimates to take forward to the quantitative assessment in the EIAR for each marine mammal species.

435. Baseline characterisation PAM can be useful to understand the species of vocalising marine mammals present in the area. While PAM can provide good information on species presence or absence and how this changes temporally on a fine scale (especially for odontocete species), it currently remains difficult to obtain a density estimate from PAM data for most species. This is due to issues relating to estimating the cue rate and subsequent detection probability function (e.g. the likelihood that the PAM systems will log acoustic cues from cetaceans at different distances, which is a key requirement for density estimation), and differentiating between species (especially dolphin species). Since the quantitative assessment in the EIAR is focussed on predicting the number of individuals impacted, the use of baseline characterisation PAM will not provide the necessary data to inform this assessment.

436. The Applicant would however note that PAM can be a useful monitoring tool to identify changes in detection rates and assess impacts from offshore wind farm construction activities at a suitable strategic scale (e.g. at a cumulative rather than project only scale), in a before-during-after or impact-gradient analysis (or a hybrid of the two).

2.10.19 Item 10s - Seal Baseline

'The DAU has noted that grey seal numbers can be highly variable from day to day during summer months, therefore density estimates should not rely solely on Morris and Duck (2018) count data. The applicant is requested to address this comment in detail and to justify:

i. The lack of seal haul-out surveys within the wider area surrounding the cable corridor.

ii. The exclusion of seal sightings from informing density estimates despite being sighted in aerial, landfall, and boat surveys.

Alternatively, should additional details, information, or surveys, be available which provides the above information the applicant is invited to amend the relative assessments within the EIAR accordingly.'

Response

437. In response to Item 10s, the Applicant notes that **Tables 2, 3 and 4** in **Volume 4, Appendix 11.3 Baseline Technical Report** of the EIAR shows that both harbour and grey seals were sighted during the vessel and aerial surveys. However, a substantial number of the seal sightings were of unidentified seals. Given both species are present it was not possible to reliably create species specific densities from these data. As per the information presented in Volume 4, Appendix 11.3, the seal habitat preference maps include telemetry data from tagged animals and account for environmental variables used in the habitat preference model (Carter *et al.*, 2022). As such, the Applicant maintains that these are the most reliable harbour and grey seal at-sea density estimates available. It is noted that the at-sea density estimates used in the assessment in **Volume 3, Chapter 11 Marine Mammals** and as validated in the **EIAR Addendum** (quantitative assessment of disturbance from unmitigated and mitigated UXO clearance, unmitigated and mitigated piling and disturbance from geophysical surveys using the new EDRs) are from Carter et al (2022), not Morris and Duck (2019). The Morris and Duck (2019) data provide an estimate of the number of seals hauled-out across regions in Ireland (used to estimate the population size in each region), not at-sea density estimates.

In response to Item 10s, Points i and ii, the Applicant has now conducted monthly seal haul-out surveys at the landfall site between Jan 2025 – Jan 2026. These are detailed in the **Appendix 11-A Update to Marine Mammal Baseline Characterisation** of the **EIAR Addendum.** The 2025-2026 surveys validate the previous surveys in that grey seals are present in the landfall area but in low numbers. The impact magnitude and conclusions in the EIAR therefore remain unchanged, and not significant in EIA terms.

Unexploded Ordnance Mitigation

2.10.20 Item 10t - Noise Abatement for High-Order

'Having regard to the content of Chapter 11 of the submitted EIAR and the stated uncertainty in relation to the ability to use low-order detonation (deflagration) in all cases of Unexploded Ordnance (UXO) clearance the applicant is requested to confirm the use of Noise Abatement Systems (NAS) in any instances of non-deflagration detonations. This is required as TTS (considered injury under legislation) goes out to 100 km for Minke Whale and 23 km for Harbour Porpoise. The MMMP should also be amended accordingly to incorporate this commitment.'

Response

438. In response to Item 10t, to mitigate potential impacts from underwater noise associated with high order UXO clearance, the Applicant commits to the implementation of noise abatement in the event of high order clearance is required. This has been updated in the **Marine Mammal Mitigation Protocol** and **Section 11** of the **EIAR Addendum (Part 1)**. Please see response to item 10a above in relation to TTS.

Cumulative Effects Assessment

2.10.21 Item 10u - TTS Impacts

'The Commission notes that cumulative effects on auditory injury (PTS) from piling have been scoped out of the CEA. However, the impact range for piling at the CWP array site overlaps that of Arklow Bank Wind Park 2 and Dublin Bay Array for TTS, which is considered injury under Irish regulations. The applicant is requested to consider inclusion of TTS in the assessment of cumulative effects and amend the assessment accordingly.'

Response

439. In response to Item 10u, the Applicant refers the Commission to the response provided to item 10a regarding TTS, and the SMRU Consulting TTS Position Statement, November 2025 (**Appendix 11-B SMRU Consulting TTS Position Statement**). To mitigate potential impacts from underwater noise during the construction of the project, the Applicant commits to a limit on underwater noise of 169 dB $L_{E,p,ss,05}$ at 750m at WTG and OSS piling events, and the implementation of noise abatement in the event high order UXO clearance is required. TTS has not been assessed in either the project alone assessment, the CEA or the NIS.

2.10.22 Item 10v - Tier 1 and Tier 2a and 2b projects

'The applicant is requested to carefully review Table 6 within Appendix 11.1 Cumulative Effects Assessment and Table 11-54 of Chapter 11 of the EIAR. Under "Tier 1 and Tier 2a and 2b projects" the contribution of CWP Project to total is listed at 0%, which appears to be a typographical error. The applicant is requested to review and update this value as necessary (in the context of the revised cumulative assessment sought under item 5 above).'

Response

440. In response to Item 10v, the Applicant refers the Commission to the updated cumulative effects assessment in the **CEA Report (Part 2)**.

2.10.23 Item 10w - iPCoD Limitations

'It is noted that the cumulative effect in 2027 from Codling Offshore Wind Park (OWP) and other projects in the area is predicted to disturb >10% of the reference population of harbour porpoise, bottlenose dolphin, common dolphin, and grey seal, and >20% of the reference population of harbour seal, which is assessed as having a Minor (not significant) impact. However, the modelling approach assumes no further construction of major projects in the 18-year period following the initial cumulative

effect, as this data (quantity and extent of future projects) is not currently known or available. The applicant is requested to include a section in Annex 1 – Assumptions and limitations and Appendix 11.4 Cumulative iPCoD Modelling to discuss the limitation associated of the model to account for future developments within the area.'

Response

441. In response to Item 10w, the Applicant notes that the iPCoD model requires very specific input values for each offshore wind farm included in the model. This includes data on: piling year(s), number and spread of pile driving days within piling year(s) and number of animals disturbed per piling day for each offshore wind farm. This data is available for the Phase 1 Projects from the submitted EIARs, but not for other future, reasonably foreseeable, projects. Therefore, it is not feasible to conduct iPCoD population modelling for all OWF screened into CEA as the data required to parameterise the model are not available. For further detail on the issues with cumulative assessments for marine mammals, please see Sinclair (2025) and Sinclair & Klementisova (2025).

2.10.24 Item 10x - Concurrent Piling

'In the event of favourable consideration, the Irish Sea Phase 1 ORE projects would be independent of one another and will be subject to their own timelines in relation to construction schedules, supply chain and contractual constraints. In this context, given the long-term piling schedule referenced in Chapter 11 and Appendices 11.1 and 11.4 of the EIAR which has fed into the assessment conclusions provided in relation to cumulative noise, the applicant is requested to either provide a more comprehensive assessment of cumulative noise assessment from concurrent pile driving across the Phase I ORE projects in the Irish sea, or alternatively provide comprehensive evidence/undertakings confirming concurrent piling will not arise.'

Response

442. The EIAR included an assessment of the Irish Sea Phase 1 Offshore Renewable Energy (ORE) projects in EIAR **Appendix 11.1 Cumulative Effects Assessment** and **Appendix 11.4 Phase 1 Irish Offshore Wind Farms - Cumulative iPCoD modelling**. This used indicative piling schedules provided by each of the five projects which represented the best available understanding of potential piling schedules at the time. In the assessment, it was assumed that the Oriel and CWP projects would both be piling in 2027.

443. The **CEA Report (Part 2)** includes an assessment of the Irish Sea Phase 1 ORE projects. This provides an updated construction timeline for each project, where piling is conducted between 2028 and 2032 across the five projects, based on best available evidence (published programmes and assumptions made on delays since the applications were submitted to the Commission). This assessment assumes concurrent piling at CWP and Dublin Array in 2031, with the conclusion presented in both the **EIAR Addendum** and **NIS Addendum** being no significant effect, and no AESI. Given there is no AESI and no significant effect predicted, further mitigation in the form of a commitment confirming concurrent piling will not arise is not considered necessary or proportionate.

2.10.25 Item 10y - Operational Noise

'Notwithstanding the rationale provided in relation to the assessment of impacts of operational underwater noise on marine megafauna, the applicant is requested to assess potential impacts from

operational underwater noise on marine mammals in terms of the cumulative assessment with other Irish Sea ORE Phase 1 projects, bearing in mind the comments raised in point 10(o) above.'

Response

444. In response to Item 10y, the Applicant maintains there is not expected to be any disturbance impacts from operational noise. As detailed in the response to Item 10o, there is evidence that marine mammals continue to actively use the array areas of operational offshore wind farms, thus indicating no disturbance.

445. Regardless, the Applicant has considered disturbance from operational noise in the **CEA Report (Part 2)**.

Natura Impact Statement

2.10.26 Item 10z - High Order Unexploded Ordnance (UXO)

'It is noted that unmitigated high-order UXO clearance is predicted to produce a PTS-onset impact range for harbour porpoise of 12km, resulting in 37.3% of the Rockabill to Dalkey Island SAC and 84 (of 227 designated population feature) porpoise impacted within a single event. A significant portion of the SAC could potentially be affected by a high-order detonation; therefore, it should be stated that it is not possible to determine no adverse effect on site integrity (Paragraph 168) for this detonation style. The applicant is requested to classify low-order detonation as mitigation alongside consideration and commitment to NAS and other mitigation methods (see also 9(t) above) or provide justification why this is not required'.

Response

446. In response to Item 10z, to mitigate potential impacts from underwater noise associated with high order UXO clearance, the Applicant commits to the implementation of noise abatement in the event high order clearance is required. It should be noted that low-order (deflagration) methods shall be the primary method of UXO clearance, where possible. This has been updated in the updated **MMMP)** and mitigated high-order clearance is assessed in **Section 11** of the **EIAR Addendum** and **NIS Addendum (Part 1** and **Part 2)**.

2.10.27 Item 10aa - Piling Disturbance

'It is noted that disturbance from piling of WTGs (Paragraph 177) has been assessed as likely to disturb either 13% (62 harbour porpoise), 22% (49 harbour porpoise), or 30% (68 harbour porpoise) of the Rockabill to Dalkey Island SAC area in a single day, based on the assessment method. Using the 145dB SELss threshold (Lucke et al., 2009) or the EDR approach, >20% of the SAC area is disturbed. JNCC (2020) guidance and European Commission (EC) limits for underwater noise pollution state that a significant effect/Level of Onset of Biologically adverse effect is achieved at 20% disturbance within a single day. At this threshold, the Commission notes it is not possible to determine no adverse effect

on site integrity. The applicant is therefore requested to reassess the impacts considering firm and detailed commitments to the use of NAS, to protect site integrity.'

Response

447. In response to Item 10aa, the Applicant commits to a limit on underwater noise of 169 dB $L_{E,p,ss,05}$ at 750m at WTG and OSS piling events, and the implementation of noise abatement in the event high order UXO clearance is required. The revised potential impact to the Rockabill to Dalkey Island SAC has been provided in **NIS Addendum (Part 1)**. The limit on underwater noise from pile driving has resulted in substantially less of an impact to the Rockabill to Dalkey Island SAC. Using the dose-response approach, the effective area disturbed is now precited to be up to 4.23% of the SAC from piling at the NW location, and there is predicted to be no disturbance within the SAC when using the 145 dB SEL_{ss} threshold, the 11 km EDR or the level B harassment threshold. Disturbance from piling is therefore below the threshold for significant disturbance: 20% of the SAC area on a single day (JNCC, 2020). Therefore, it can be concluded beyond reasonable scientific doubt that, adverse effects on site integrity will not arise as impacts on the qualifying Annex II marine mammal species, harbour porpoise, which would undermine the COs of the Rockabill to Dalkey Island SAC will not occur as a result of behavioural disturbance from underwater noise generated from WTG piling.

Updated data

2.10.28 Item 10bb

'The Commission notes that the 2024 ObSERVE II Programme Reports were published subsequent to the lodgement of the current planning application. The applicant is requested to review the outputs of the 2024 ObSERVE II Programme Reports, and incorporate these results within their marine mammal assessments, as appropriate, updating the EIAR and NIS where relevant.'

Response

448. In response to Item 10bb, the Applicant has considered the following updated data in the **EIAR Addendum** and **NIS Addendum** (as detailed in **Appendix 11-A Update to Marine Mammal Baseline Characterisation** of the **EIAR Addendum (Part 1)**):

- OBSERVE II (Giralt Paradell et al., 2024)
- SCANS IV density surface (Gilles et al., 2025)
- CWP DAS 10 km buffer of array area (May 2025 – Nov 2025)
- CWP seal land-fall surveys (Jan 2025 – Jan 2026)
- Seal haul-out surveys in Dublin Bay and wider area (Berrow et al., 2024)
- Aerial thermal-imaging survey of seals in Ireland in August 2024 (Morris et al., 2025)
- Dublin Port Company surveys (Dublin Port Company, 2025).

2.11 Item 11 Fish and Shellfish Ecology

Study area

2.11.1 Item 11a

'In relation to Chapter 9 – 'Fish, Shellfish, and Turtle Ecology' of the EIAR, the applicant is requested to redefine the selected study areas and reference them appropriately and consistently throughout their assessment.

It is stated in paragraph 20 of the Chapter that the regional study area is for the assessment of near field indirect impacts, and in Paragraph 21 that the National study area is for the assessment of far-field indirect impacts. However, a number of impacts have been assessed against these wider study areas inappropriately. For example, in Paragraph 409 considering long term habitat loss, a comparison has been made to the Irish Sea Study Area, despite this impact being neither far-field nor indirect.

Furthermore, the use of the 'national study area' when considering impacts on potential spawning areas seems disproportionately large, which may lead to underrepresentation of impacts via dilution.

The Commission also notes that the farthest ranging impacts (underwater noise) do not extend significantly beyond ICES Rectangles 35E3, 35E4, 34E3, and 34E4. Beyond the use of larger study areas for describing the baseline, and possibly for the consideration of impacts to migratory pathways, study areas should be reduced to a more appropriate scale. The applicant is therefore requested to reassess the impacts using a study area only comprising ICES Rectangles 36E3; 36E4; 35E3; 35E4; 34E3; and 34E4, and/or provide further scientific justification of their alternative approach.'

Response

449. The Applicant considered the local, national and regional study areas used in **Volume 3**, **Chapter 9 Fish, Shellfish and Turtle Ecology** of the EIAR to be appropriate to account for the biology of the receptors (i.e. areas over which populations present), informed through the predicted extents of impacts, and defined on the basis of International Council for the Exploration of the Sea (ICES) statistical rectangles to allow reference to comparative datasets.

450. The spawning and nursery areas used throughout the chapter are not bound by the specified ICES rectangles, as fish activity within such areas can be variable year on year as a result of a range of factors including annual climatic variation. Coull *et al*. (1998) and (Ellis *et al*., 2012) are recognised as the best available scientific data on spawning grounds for the purposes of spatial assessment of impacts as they are based on multiple data types, including historical data, trawl surveys and egg and larval distribution covering Ireland and the UK. Coull *et al*. (1998) provides data across decades while Ellis *et al*. (2012) provides contemporary trawl data, includes elasmobranch species and uses abundance data to classify spawning and nursery grounds as high and low intensity. The Marine Institute (2024) data, whilst useful in an Irish context is based on commercial fishing data around Ireland which has limitations such as a smaller time series of data (mainly 2004 – 2009), and spawning grounds are indirectly informed by egg and larval surveys for three species only. In addition, the Applicant has acquired recent environmental deoxyribonucleic acid (eDNA) survey results which have been incorporated into the EIAR Addendum and provide site specific data of the fish community present to compliment and validate the original baseline characterisation (**Section 9.4** of the **EIAR Addendum (Part 1)** and **Appendix 9-A CWP Migratory Fish eDNA Survey Report 2025** of the **EIAR**

Addendum)[9]. All three data sets are utilised to provide a composite of datasets that robustly characterises the receiving environment for the purposes of EIA and meets the requirements of the relevant guidance (CIEEM (2024), EPA (2022) and DCCAE (2018)[1,2]). Using the study area that captures the widest extent of such spawning grounds is considered not to underrepresent impacts, rather it is considered the most accurate representation of the potential spatial distribution of the receptors during key life history stages, and as such the Applicant maintains that the study areas used remain the most suitable and accurate basis for contextualising the impacts.

451. The limitations in the data provided, particularly around the change in landings data to reflect the refined study area, do not affect the conclusions of this assessment because the data are used together to generate an indication of the likely community composition of fish that are present within the area, and this is combined with other literature / data sources to ensure the most complete picture of the baseline is generated (as possible).

452. Nevertheless, in response to the FIR, each impact has been re-assessed against a regional study area of the following ICES statistical rectangles 36E3; 36E4; 35E3; 35E4; 34E3; and 34E4. The local, Irish Sea and national study areas, as defined in **Chapter 9 Fish, Shellfish and Turtle Ecology** of the EIAR, remain unchanged. **Section 9** of the **EIAR Addendum (Part 1)** presents information on the study areas used in the updated assessment. Assessments have been undertaken based on the new regional study area.

Valued Ecological Receptor Groups

2.11.2 Item 11b

When assessing impacts using Valued Ecological Receptors (VERs), specific consideration must be given to the worst-case presented by each species. An example is presented within the assessment of sensitivity for "Other fish" within Impact 2: EMF from Cable. Text presented within paragraph 458 states:

"The presence of EMF from cables may result in behavioural changes such as attraction or avoidance of a discrete area or changes in normal behaviours such as foraging (Gill et al., 2009), as such tolerance is considered high."

However, tolerance for European eel (very low) and river lamprey (low) as presented within Table 9-79 does not correspond with this statement, and is not discussed within the body of the text. This tolerance should be discussed further, with relevant sources relating to the potential impacts that EMF may have on the migration of these species, citing relevant literature and field studies.

When making a determination of sensitivity for "Other fish", the VER as a whole should then be considered as very low to represent the worst-case, or species with a Tolerance lower than High should be considered separately.

[9] Whilst not undertaken specifically for the purpose of invasive non native species (INNS) it is noted that eDNA is recognised by Ireland's Marine Institute as becoming increasingly important for the monitoring and surveillance of unwanted or harmful aquatic species. https://emff.marine.ie/sites/default/files/bluegrowth/PDFs/gmit_2022_-_edna_toolkit_-marine_invasive_species_ireland_project.pdf

The applicant is requested to ensure that, throughout the assessment, worst-case determinations of criteria are used for the VER as a whole, or that individual species with outlier criteria are considered separately, ensuring these species are given appropriate consideration.

Response

453. In response to Item 11b of the FIR, the Applicant has provided further information to support an update to the Valued Ecological Receptors (VERs). The assessment update is provided in **Section 9.10 Impact assessment** (Impact 2: EMF from cables) of the **EIAR Addendum (Part 1)**.

454. Each receptor group has been assessed based on the worst case sensitivity of the species within the group. This has been made clearer throughout the assessment within the **EIAR Addendum**, noting that the overall sensitivity is based on the adaptability, tolerance and recovery of each species to the assessed impact.

455. The Applicant notes the example provided, and can confirm this was an inconsistency which has been updated in **Section 9** of the **EIAR Addendum (Part 1)**. Despite this, the overall sensitivity of the VER group was assigned correctly, based on the highest sensitivity present within the group and therefore the significance conclusion remains true.

456. It should be noted that receptor groups are determined based on similarity of biological traits relevant to the impact under assessment, and the approach applied in the assessment to rely on the greatest sensitivity within the group ensures that the assessment conclusions are precautionary, and as such conclusions at the level of individual species are not necessary. Nevertheless, **Section 9.10** of the **EIAR Addendum (Part 1)** has been updated to ensure this is clear with the assessment conclusion stating the overall sensitivity for each receptor group.

Sensitivity and Magnitude Definitions

2.11.3 Item 11c

The applicant is requested to clarify the language and classifications used when making determinations of sensitivity criteria and amend the EIAR accordingly. In this regard, with the exception of 'Value', each of these criteria are inversely proportional to sensitivity (e.g. lower adaptability corresponds with higher sensitivity). However, no clarification is provided to indicate what definition this corresponds to within Table 9-3 (e.g. is a species with 'High' adaptability one that fits the criteria for 'Low' or 'Very Low' sensitivity within the table?). Once clarified the applicant is requested to ensure that this is implemented consistently throughout the chapter.

An example of where the lack of clarity creates uncertainty is within the assessment of sandeel sensitivity to temporary habitat disturbance in Table 9-23.

i. *Timescales for recoverability within Table 9-3 are longer than those presented within the Resilience (recovery) tables in the cited source (Tyler-Walters et al., 2023). Whilst it is noted that timeframes of up to 60 years are presented within EPA guidance, the applicant is requested to reconsider these timescales. Specifically, recoverability periods of up to 60 years are not considered proportional to the level of recoverability claimed (medium), and it is suggested that timescales longer than the lifetime of the project should reasonably be considered High.*

ii. *Within Table 9-3 of the EIAR both High and Medium sensitivity value criteria include "OSPAR list of threatened or declining species". The applicant is requested to revise this table and subsequent assessment results to qualify the OSPAR list of threatened or declining species solely to High*

value sensitivity. Similarly, the applicant is requested to assign High value to those species defined as "Important Species" within the National Marine Planning Framework and amend Table 9-3 and subsequent assessments accordingly.

iii. *The applicant is requested to revise Chapter 9, Fish, Shellfish and Turtle Ecology throughout to ensure that definitions provided within Tables 9-3 and 9-4 for Sensitivity and Magnitude are adhered to through the assessment discussions and conclusions, ensuring their assessment criteria remain distinct.*

Throughout the chapter, magnitude has been assessed in a variable or changing scale for each receptor group. Magnitude for each receptor group should have the same magnitude of effect per impact/pressure. The variability is related to the sensitivity of each receptor group to that specific impact/pressure. The applicant is requested to undertake a single assessment of magnitude for each impact i.e. related to the extent, duration, frequency, and consequences of that impact. Consequence should not cross into an assessment of sensitivity of individual receptor groups. Consideration of receptor sensitivity is brought into consideration following this for each receptor group, based on an assessment of adaptability, tolerance, recoverability, and value.

An example of inappropriate use of these definitions is presented within Paragraph 500, where the mobility of a species (Adaptability) and the presence of nearby spawning grounds (Tolerance and/or Recoverability) are used in the determination of magnitude. This is inappropriate, and the applicant is requested to address this issue throughout the assessments provided within Chapter 9.

Response

457. In response to Item 11c of the FIR, the Applicant has amended the text within **Section 9.10** of the **EIAR Addendum (Part 1)** to support an update to the sensitivity criteria and provide more justification. Updates have been provided to the 'value' criteria as requested in **Table 9-B** within **Section 9.4** of the **EIAR Addendum (Part 1)**, however the overall determination of sensitivity for each receptor group remains unchanged. The assessment update is provided throughout **Section 9.10** of the **EIAR Addendum (Part 1)**. The Applicant has also amended any sensitivity and magnitude values that were inconsistent.

458. **Section 9.4.3** of **Volume3, Chapter 9 Fish, Shellfish and Turtle Ecology** of the EIAR (paragraph 41) states that the significance of effect can be determined by comparing the character of the predicted effect to the sensitivity of the receiving environment (EPA, 2022; CIEEM, 2022). As stated in **Volume 2**, **Chapter 5 Environmental Impact Assessment Methodology** of the EIAR, sensitivity is not only defined through application of known research but also expert judgement and past experience. The Applicant refers specifically to **Section 5.9.2** of **Chapter 5 Environmental Impact Assessment Methodology** of the **EIAR** which states that "*Expert judgement is particularly important when determining sensitivity of receptors. For example, an Annex II species (under the Habitats Directive) would have high inherent value but may be tolerant to an impact or have high recoverability. In this case, sensitivity would reflect the ecological robustness of the species and not necessarily default to its protected status".* As such, based on the EPA guidance (EPA, 2022), the Applicant maintains the application of expert judgement and experience an important part of determining the sensitivity of fish, shellfish and turtle ecology receptors.

459. (i) Whilst the Applicant acknowledges the request to reconsider the recoverability timescales, it is noted that these are in line with the relevant peer reviewed scientific literature, consistent with OWF developments within the broader Irish Sea and other Phase I Irish Project applications (e.g., Arklow Bank II and North Irish Sea Array (NISA)), and reflect current guidance (EPA, 2022). This alignment across the Phase 1 projects is considered important to provide consistency and common standards

across assessments. Additionally, the CIEEM Guidance (CIEEM, 2024) notes that impacts and effects may be described as short, medium and long term and permanent or temporary, and these will need to be defined in months / years. The timescales selected offer meaningful degrees of assessment that account for impacts that may extend beyond the lifetime of the project. The Applicant has therefore maintained the recovery timescales as presented in the EIAR in order to maintain the consistency already in place across current project applications, maintain consistency with guidance, and offer meaningful levels of assessment.

(ii)The Applicant notes the request to update the value attribute of sensitivity for certain species. NMPF species are those which are defined according to both international and national criteria and include species which fall under the Habitats Directive Annex II, Oslo and Paris Commissions (OSPAR), International Union for Conservation of Nature (IUCN) and Wildlife Acts (See **Table 3**). The applicant has revised the relevant text and tables in **Section 9.10** of the **EIAR Addendum (Part 1)** to reflect this request and has assigned the NMPF and OSPAR list of threatened or declining species as having a 'high value'. This change does not affect the overall assessment conclusions.

Table 3 NMPF Species

Species	Scientific Name	Protection / Importance
Allis shad	*Alosa alosa*	Annex II, OSPAR, IUCN (critically endangered)
Angel shark	*Squatina squatina*	OSPAR, IUCN (critically endangered)
Atlantic cod	*Gadus morhua*	OSPAR, IUCN (vulnerable)
Atlantic salmon	*Salmo salar*	Annex II, OSPAR, IUCN (near threatened)
Basking shark	*Cetorhinus maximus*	OSPAR, Wildlife Acts, IUCN (endangered)
Blonde ray	*Raja brachyura*	IUCN (near threatened)
Bull huss / nursehound	*Scyliorhinus stellaris*	IUCN (near threatened)
Common skate	*Dipturus batis*	OSPAR, IUCN (critically endangered)
Common sole	*Solea solea*	IUCN (data deficient)
Cuckoo ray	*Leucoraja naevus*	IUCN (near threatened)
European eel	*Anguilla anguilla*	OSPAR, IUCN (critically endangered)
Freshwater pearl mussel	*Margaritifera margaritifera*	Annex II & V, Wildlife Acts, IUCN (endangered)
Leatherback turtle	*Dermochelys coriacea*	Annex IV, Wildlife Acts, IUCN (vulnerable)
River lamprey	*Lampetra fluviatilis*	Annex II, IUCN (near threatened)
Sea lamprey	*Petromyzon marinus*	Annex II, OSPAR, IUCN (least concern)
Small eyed ray	*Raja microocellata*	IUCN (near threatened)
Spiny dogfish / spurdog	*Squalus acanthias*	OSPAR, IUCN (vulnerable)
Spotted ray	*Raja montagui*	OSPAR, IUCN (least concern)
Starry smooth hound	*Mustelus asterias*	IUCN NT
Thornback ray	*Raja clavata*	OSPAR, IUCN NT
Tope	*Galeorhinus galeus*	OSPAR, IUCN (vulnerable)

Species	Scientific Name	Protection / Importance
Twaite shad	*Alosa fallax*	Annex II, OSPAR, IUCN NT
Undulate ray	*Raja undulata*	OSPAR, IUCN NT

460. (iii) The Applicant has reviewed **Chapter 9, Fish, Shellfish and Turtle Ecology** of the EIAR in order to ensure that information on magnitude and sensitivity is present in the relevant sections, ensuring criteria remain distinct.

461. The magnitude criteria were determined based upon the most relevant guidance available for undertaking EIA on ecological receptors, notably Guidelines for Ecological Impact Assessment in the UK and Ireland (CIEEM, 2022) and the Guidelines on the information to be contained in Environmental Impact Assessment Reports (Environmental Protection Agency, Ireland, 2022). Noting the 2022 Guidelines for Ecological Impact Assessment in the UK and Ireland has been superseded by the 2024 revision, no meaningful updates with respect to determining magnitude criteria have been made that would alter the approach taken in the EIAR.

462. It should be noted that a number of the criteria used to determine the magnitude of the impact derived from the guidance described above are inherently linked to biological characteristics, and as such magnitude was similarly linked. Receptor groups were defined by their biological traits which enabled magnitude to be determined at the group level, and addressed the practical issue of species by species assessments which were not considered necessary or proportionate in order to reach a robust and informed conclusion. A very clear example is the definition of consequence, which is inherently linked to biological sensitivity to a pressure or impact, as it represents the response seen in that receptor. A receptor that is defined within the scientific literature as not being sensitive to an impact would have a lesser response, and thus a reduced consequence, than a receptor that was identified within the scientific literature as highly sensitive to a pressure or impact which may react more strongly to the same pressure, or be subject to a greater level of consequence.

463. Nonetheless, in response to FIR 11c(iii), the Applicant provides a single assessment of magnitude for each impact in **Section 9.10** of the **EIAR Addendum (Part 1)**.

464. These changes do not alter the conclusions of the original assessment and the findings of the original EIAR remain valid.

Baseline

2.11.4 Item 11d

'The applicant is requested to give consideration to Marine Institute dataset "Marine Institutes Commercial species spawning and nursery areas", alongside Coull et al. (1998); Ellis et al. (2012); and Ireland's Marine Atlas data. Where this dataset presents spawning and nursery grounds additional to the sources currently used, these should be integrated into the determination of baseline conditions and used to inform any subsequent assessment.'

Response

465. In response to Item 11d of the FIR, the Applicant has integrated the Marine Institute (2024) data into the updated assessment available in **Section 9.10** of the **EIAR Addendum (Part 1)**.

466. It is noteworthy that the spatial footprints of spawning and nursery areas presented in the Marine Institute (2024) data matches that of the 'Ireland Marine Atlas' data already presented in **Chapter 9 Fish, Shellfish and Turtle Ecology** of the EIAR. Nevertheless, where the assessment refers to information originating from Ireland's Marine Atlas, this has been replaced to account for the updated Marine Institute (2024) data with the Ireland Marine Atlas (2018) data being superseded and no longer presented to avoid duplication.

EIA Impacts

2.11.5 Item 11e

'In relation to EIAR Chapter 9, Construction Phase Impact 1: 'Temporary seabed habitat disturbance', in the assessment of "Mobile fish with spawning and nursery areas that overlap", the Commission notes that recoverability has been presented as 'High' for all species within the receptor groups based on high fecundity. However, local populations of species with a strong benthic association at any life stage (i.e. sandeel and elasmobranchs) have the potential to experience a reduction in fecundity due to loss of supporting habitat. The applicant is requested to provide more detailed consideration of this impact amending or providing further justification and/or clarity regarding the conclusions presented in their assessment in relation to impacts on local species with a strong benthic association.'

Response

467. In response to Item 11e of the FIR, the Applicant has provided further information to support an update to the construction phase impact assessment and determination of recoverability. The assessment update is provided in **Section 9.10** of the **EIAR Addendum (Part 1),** (Impact 1: Temporary seabed habitat disturbance). However, these changes do not alter the conclusions of the original assessment and the findings of the original EIAR remain valid.

2.11.6 Item 11f

'The applicant is requested to add relevant figures from Appendix 6.3 to the assessment of temporary disturbance of the seabed leading to increases in Suspended Sediment Concentration (SSC). These figures should be overlaid with known and potential spawning, nursery, and habitat for fish and shellfish species with strong benthic associations; notably Atlantic herring (Dundalk Bay population, and regions to the south) and sandeel.'

Response

468. In response to Item 6i of the FIR the Applicant undertook additional sediment plume modelling, see **Appendix 6-A of Chapter 6 Marine Geology, Sediments and Coastal Processes** of the **EIAR Addendum**. The results of the updated sediment plume modelling are summarised and assessed in **Section 9.10** of the **EIAR Addendum (Part 1)**. In response to Item 11f of the FIR, the Applicant has provided **Figure 9-rr** and **Figure 9-tt** for sandeel spawning and nursery grounds and **Figure 9-ssss** for herring spawning and nursery grounds in **Section 9.10** in the **EIAR Addendum (Part 1)**. These figures illustrate the maximum spatial extent of modelled SSCs generated over the full construction campaign, which represent the disposal of dredge arisings, cable trenching, and WTG foundation installation.

2.11.7 Item 11g

'The Commission considers, based on the application documentation submitted, that the assessment within the EIAR in relation to consideration of underwater noise, appears under-precautionary with regard to modelling and impact assessment as follows:

i. *Industry best practice would suggest that fish are to be considered a stationary receptor, and therefore references to 'expected fleeing behaviour' are not relevant to fish, notably when relating to the use of soft-starts. This approach has the potential to greatly underestimate the impact ranges on fish populations. It is noted that within the EIAR chapter references are made to both fleeing and stationary models, and it is unclear what model has been used for the determination of significance.*

   Whilst it is noted that both stationary and fleeing models have been used, it is unclear whether values in tables (e.g. Table 9-33), and figures used in the assessment of noise and vibration impacts are presenting values for fleeing or stationary receptors. The applicant is asked to clarify the sources and calculations behind the values shown in all tables (i.e. whether based on fleeing or stationary models). Should fish have been considered as a fleeing receptor, the applicant is requested to either revise the relevant assessments within the EIAR (and other planning documentation if required) with fish considered as stationary receptors, or comprehensively justify their assessment as fleeing receptors with reference to appropriate evidence.

   Should impacts relating to underwater noise change in their extent following these changes, the applicant is requested to make any necessary revisions to the assessment of relevant cumulative effects.

ii. *It is unclear why the presence of spawning and nursery grounds has been used as the determining factor for including/excluding species within the assessment of underwater noise and vibration impacts. It is acknowledged that fish species may be likely to congregate to these areas during their spawning/nursery period. However the majority of fish species are highly motile, and produce eggs and larvae that are planktonic in nature i.e. are part of the plankton and are unable to resist movement via tides and currents. Therefore, impacts to these species cannot be discounted on the basis of an absence of spawning/nursery grounds.*

   It should be noted that the spawning locations for some species are of importance when considering underwater noise impacts. In particular, this applies to Atlantic herring (Clupea harengus), where eggs are laid on the seabed and are therefore spatially locked to areas of suitable sediment until their planktonic life stage (e.g. disperse as larvae into the water column when the majority of the yolk sac has been absorbed).

   In this context the applicant is requested to amend their assessment criteria and conclusions in relation to species that do not have a benthic dependence for spawning activity or where adults are not bound to specific spawning or nursery grounds. In the absence of such revisions the applicant must provide further comprehensive clarification/justification in relation to their adopted approach.

iii. *A number of assessment conclusions do not appear to present or consider the potential worst-case scenarios in relation to overlap with spawning grounds. As an example, Figure 9.38 indicates the northeast piling location overlaid with Coull et al. (1998) spawning and nursery grounds despite the northwest location appearing to present a greater overlap of piling-related pressure/impact pathways/envelopes. The applicant is requested to address this matter by amending their assessment and conclusions to consider the most conservative/impactful scenarios. Alternatively, the applicant must provide full justification/clarification as appropriate that the scenario considered*

represents the most conservative/greatest magnitude of impact that could arise from the proposed development.

iv. *The applicant is requested to incorporate evidence within the EIAR that will clearly indicate whether there is an overlap (or not) of underwater noise impacts with the Atlantic herring spawning grounds to the north of the proposed development. An additional figure should be provided to show any potential overlap, noting that the indicated impact ranges should consider Atlantic herring as stationary receptors for this assessment.*

v. *The applicant is requested to provide appropriate citations supporting/validating the statement in paragraph 300 of Chapter 9, which references that the majority of anadromous species will not experience any barrier effects from noise and vibration for their migratory movements. Consideration should also be given to the potential for a worst-case scenario of underwater noise impacts on migratory species being represented by those piling locations closest to the coast, where the potential for barrier effects to prevent coast-adjacent movement is most likely*

vi. *The applicant is requested to provide additional clarification to better explain the values presented within Table 9-33; 9-38; 9-43; and 9-49 "Temporal overlap results". While it could be assumed from the text in Paragraph 189 that the TTS area has been divided by the proportion of the year that each given species carries out spawning/nursery activity, this is not stated explicitly. If this assumption is correct, those months considered should be presented within the table, and the calculations to arrive at the values in the "Impacted spawning potential" column presented. Also, a definition of "km2h" is required. Item 11(g)(ii) above, regarding the validity of using spawning or nursery grounds of species in the EIA also needs to be considered.'*

Response

469. (i) In response to item 11g (i) of the FIR, the Applicant has updated the text within **Section 9.10** (Impact 2: Noise and Vibration) of the **EIAR Addendum (Part 1)** for noise and vibration to clarify the basis for assessment.

470. For the avoidance of doubt, the conclusions in the EIAR are already drawn based on the most conservative basis, i.e. the modelled outputs for stationary fish. It is generally accepted that fish will flee underwater noise sources, unless there is a biological imperative to remain (e.g., spawning), further reinforcing the adoption of the stationary results, is highly precautionary. As such, no changes are required to the assessment conclusions which are already based on this precautionary approach.

471. (ii) In response to item 11g (ii) of the FIR, the Applicant notes the assessment requested on mobile receptors is already provided in **Section 9.10** of **Volume 3**, **Chater 9 Fish, Shellfish and Turtle Ecology** of the EIAR. In addition to this assessment on mobile receptors, it is considered best practice to consider impacts on sensitive or important habitats for fish species, as defined by spawning and nursery grounds (Faulkner et. al., 2018). This allows a spatio-temporal assessment of the effects to species at key life history stages.

With regards to assessment of receptors both with and without a benthic dependence during spawning, these are detailed within the receptor groups already provided. The receptor groups were determined through application of best practice assessment approaches at the time of writing (i.e., application of the hearing sensitivity groups, as defined by Popper *et al.* (2014)), and includes eggs and larvae as a defined receptor group, noting their planktonic life stages and inability to actively avoid impacts. Herring are considered as a group three hearing fish in the assessment. Paragraphs 164 and 167, **Section 9.10** of **Volume 3, Chater 9 Fish, Shellfish and Turtle Ecology** of the EIAR explains the link to hearing sensitivity and the assignation of receptor groups on this basis. Within these groups, an assessment of all mobile fish receptors is presented (e.g., paragraph 171, **Section 9.10** of **Volume 3, Chater 9 Fish, Shellfish and Turtle Ecology** of the EIAR). This is followed by consideration of key

fish habitat (represented by spawning and nursery grounds as defined by Ellis *et al.* (2012); Coull *et al.* (1998) the Ireland's Marine Atlas (2018) data (now superseded by the Marine Institute (2024).

472. (iii) in response to item 11g (iii) of the FIR, the Applicant notes the discrepancy in, for example, **Figure 9.38** of **Volume 3**, **Chater 9 Fish, Shellfish and Turtle Ecology** of the EIAR. This has been amended and is provided in the **EIAR Addendum (Part 1)** (**Figure 9-II** Atlantic cod spawning and / or nursery overlap with noise modelling contours). All assessments were based on the greatest overlap of the spawning or nursery habitat with the relevant noise contours, and therefore are considered to be correct. Images were provided to represent the overlap without excessive layers overshadowing the general picture. All figures have now been updated to show piling locations with the greatest overlap with the habitat, and overlap calculations have been updated with new noise modelling outputs.

473. (iv) In response to item 11g (iv) of the FIR, the Applicant has provided an additional figure (**Figure 9-oo: Abated noise modelling for the western piling locations for group 1 fish species** of the **EIAR Addendum (Part 1)**) demonstrating the lack of -overlap with the Herring spawning grounds to the north of the CWP Project with noise contours (for a stationary receptor). It should also be noted that the Herring spawning ground highlighted is outside the revised regional study area requested to be used for relevant assessments. The conclusions presented within the EIAR remain unchanged on this basis (Not significant).

474. (v) In response to item 11g (v) of the FIR, the Applicant has provided further information, figures, and citations to support the text within **Section 9.10** of the **EIAR Addendum (Part 1)** assessment for noise and vibration for anadromous species. The assessment is provided in **Section 9.10** of the **EIAR Addendum (Part 1)** (Impact 2: Noise and Vibration) and supports the conclusions of the original assessments, which remain unchanged.

475. (vi) In response to item 11g (vi) of the FIR, the Applicant has updated Table 9-33; Table 9-38; Table 9-43; and Table 9-49 in **Volume 3, Chapter 9 Fish, Shellfish and Turtle Ecology** of the EIAR, and provided further explanation for the spawning potential calculation. These updates include explicit definition of spawning periods considered, and a definition of spawning potential in km^2h. The spawning potential was calculated by multiplying the hours of spawning within a year (based on months listed in the tables), by the total area of relevant habitat within the ICES regional study area. The impacted spawning potential was calculated by multiplying the area of overlap between piling noise and habitat (in km^2), by the number of piling hours. The assessment is provided in **Section 9.10** of the **EIAR Addendum (Part 1)** (Impact 2: Noise and Vibration).

Temporary disturbance of the seabed and deposition

2.11.8 Item 11h

'The Commission notes that cardinal directions, distances, and settlement depths are given throughout Chapter 9 of the EIAR in relation to increases in Suspended Sediment Concentration (SSC) and associated deposition. The applicant is requested to amend the assessment and consideration within the chapter to provide the total area over which sediment will occur, and associated depths of cover (further to the response to item 6(i) of this further information request) in order to contextualise the magnitude of these impacts.'

Response

476. In response to Item 6i of the FIR the Applicant undertook additional sediment plume modelling (see **Appendix 6-A Modelling Report Addendum** and **Section 6** of the **EIAR Addendum (Part 1)**). The results of the updated sediment plume modelling are summarised and considered in **Section 9.10** of

the **EIAR Addendum (Part 1)** and in response to Item 11h of the FIR. Additional sediment plume modelling results indicate that increases in SSC and disposition will predominantly occur in a North-South / slight east direction up to 7 km with a maximum increase in SSC of 400 mg / L and maximum cumulative sediment deposition of *c.* 4 cm. The potential footprint for cumulative sediment deposition (> 1 cm) for all construction activities is 9 km^2.

477. The additional sediment plume modelling validates the original assessment for Impact 3: Temporary disturbance of the seabed leading to increases in SSC and associated deposition and conclusions in **Section 9.10** of the **EIAR Addendum (Part 1)** are unchanged.

Long-term habitat loss

2.11.9 Item 11i

'The applicant is requested to clarify the statement at paragraph 433 of Chapter 9, which refers to the area of Nephrops habitat being affected as being greater than 0.01%. If this is the case the applicant must provide the actual value. If, however, this is a typographical error the applicant is requested to correct it.'

Response

478. In response to item 11i of the FIR, the Applicant has corrected the typographical error (should be less than 0.005) and provided an updated paragraph, presenting the actual value. It should be noted that this value was already included in **Table 9-71** in **Volume 3, Chapter 9 Fish, Shellfish and Turtle Ecology** of the EIAR. The update is provided in **Section 9.10** of the **EIAR Addendum (Part 1)**.

Electro-magnetic Fields (EMF)

2.11.10 Item 11j

'Assessment of impacts for EMF considers only the magnetic flux density at the sediment surface when considering a burial depth of 1m, and does not give consideration for magnetic flux density at the cable surface, which will likely be several orders of magnitude greater. The applicant is requested to give consideration to EMF impacts from the cable surface out to the point where they are indistinguishable from background levels. This approach is necessary to account for both impacts on species with burying behaviours, and for potential insufficient cable burial, with citations provided by the applicant implying that physiological and behavioural changes may occur when making these considerations

Response

479. In response to item 11j of the FIR, the Applicant has provided additional information regarding the electromagnetic field (EMF) effects, including the magnetic flux density at the cable surface and EMF impacts from the cable surface to the point where reach background levels. The additional information, along with additional citations where applicable and relevant are provided in **Section 9.10** (Impact 2: EMF from cables) of the **EIAR Addendum (Part 1)**.

480. In areas where the depth of cover (i.e. material over the buried cable) is not adequate, then additional cable protection would be installed therefore maintaining separation between marine organisms and the cable surface.

481. The additional information and citations provided in **Section 9.10** of the **EIAR Addendum (Part 1)** supports the magnitude of impact from EMF to the relevant fish, shellfish and turtle ecology receptors being negligible and therefore validates the conclusions of the original assessments which remain unchanged.

2.11.11 Item 11k

'Values provided in Table 9-79 do not align with text presented in paragraph 458 stating "The presence of EMF from cables may result in behavioural changes such as attraction or avoidance of a discrete area or changes in normal behaviours such as foraging (Gill et al., 2009), as such tolerance is considered high". Tolerance provided within Table 9-79 for European eel (very low) and river lamprey (low) does not correspond with this statement, and is not discussed within the body of the text. The applicant is requested to provide additional context and consideration to the tolerance of these species in relation to EMF, to ensure the inclusion of sources relating to the potential impacts that EMF may have on the migration of these species, citing relevant literature and field studies where available.'

Response

482. In response to Item 11k of the FIR, the Applicant has corrected this inconsistency, with all species experiencing a high tolerance to EMF in **Section 9.10** (Impact 2: EMF from cables) of the **EIAR Addendum (Part 1)**. Further information in relation to rivel lamprey and European eel is provided in **Section 9.10.2** the **EIAR Addendum (Part 1)**. This additional information supports the conclusion that the presence of EMF from cables may result in behavioural changes such as attraction or avoidance of a discrete area or changes in normal behaviours such as foraging (Gill et al., 2009), but note widespread avoidance. As such tolerance is considered high and therefore validates the conclusions of the original assessments.

2.12 Item 12 Commercial Fisheries

2.12.1 Item 12a

'The NMPF provides that the proposed development should be considered in the context of co-existences with existing marine activities in the area, including fisheries and aquaculture. Having regard to the provisions of the NMPF, the submitted EIAR (including the Fisheries Management and Mitigation Strategy) and all observations made the Commission raises the following queries:

i. Notwithstanding the statements contained within Chapter 12 (Commercial Fisheries) and the Fisheries Management Mitigation Strategy (FMMS) the applicant is requested to address the observations by prescribed bodies and observers who raise concerns in relation to the potential impacts on commercial fishing arising from the proposed development within both the array and cable route corridor areas, specifically relating to the practicality and uncertainties of co-existence with reference to co-existence policy 1 in the NMPF.

ii. The applicant is requested to address observations by prescribed bodies and observers who raise concerns in relation to the displacement of fishing effort during operational activities. In particular, the Marine Institute submit that the displacement of fishing effort would potentially increase fishing

pressure and competition in neighbouring areas. The applicant is requested to consider, in a holistic and integrated manner, cumulative impacts (see also point 5 above) associated with the potential effects of such displacement of fishing effort associated with other Irish Sea Phase 1 ORE projects in this area.'

Response

483. With regards to point 12(a)(i), the Applicant refers to the **Observations Response Document** where responses to the observations by prescribed bodies and observers who raise concerns in relation to the potential impacts on commercial fishing are provided.

484. As highlighted in the National Marine Planning Framework (NMPF) Coexistence policy 1, co-existence between offshore wind and fisheries should be prioritised. The Applicant is committed to promoting co-existence between the CWP Project and fishing activities. An approach to avoiding and reducing impacts to both the commercial fishing and offshore wind farm industries is considered the most sustainable approach to achieve this.

485. **Appendix A** of the **Planning Report Appendices** submitted with the planning application details the assessment of the CWP Project against the NMPF policies. Appendix A.11 states:

486. '*As presented within EIAR Volume 3, Chapter 12 Commercial Fisheries, a number of measures have been adopted to facilitate co-existence, including the project WTG layout options being developed to avoid or minimise interaction with known areas of high fishing density, where possible. As avoidance is not always possible, the layouts have also been developed to increase the potential for coexistence. […]*

487. *The project will facilitate the operational coexistence. Fishing will not be excluded from the Project area as the array layout has considered fishing activity that occurs in the area. Infrastructure has been sited appropriately to facilitate co-existence where possible. Operational safety zones may apply around structures and would usually be up to 50m. However, given the total area of the offshore Project area, it is not expected that the impact would be significant. The design of the inter-array, interconnector and export cables will not present any restriction to fishing effort in the local area'.*

488. With regards both points 12(a)(i) and (ii), the Applicant does not anticipate a significant impact on commercial fishing during the operational phase, as there is currently no legislation in Ireland that restricts or prohibits fishing activity within operational offshore wind farm sites. The Applicant expects that fishing activity will resume within the array site once construction is complete, consistent with experience from operational wind farms in the UK and internationally, where there are several examples of fishing co-existing alongside wind energy infrastructure. For example, static fishing within Westermost Rough, Block Island Wind Farm in USA, Hornsea One and Rampion, including whelk fishing within Gwynt Y Mor. **Appendix 12-A Evidence of fishing within OWF array areas** of the **EIAR Addendum** provides evidence of resumption of fishing within operational wind farms. However, the Applicant recognises and takes seriously the concerns raised by fisheries stakeholders, particularly around the practicalities and uncertainties of co-existence, and the potential for changes in how certain gear types may operate within or adjacent to the development footprint. In response, the Applicant proposes to implement monitoring of catch per unit effort (CPUE) and spatial fishing patterns, working in collaboration with fishers and scientific partners, to provide transparent, evidence-based insight into the resumption and continuity of fishing activity. In particular, this includes, undertaking a dedicated pre- and post-construction monitoring programme to determine changes in CPUE of whelk within the array site. This approach will help build stakeholder confidence and ensure that any unexpected barriers to co-existence are identified early and addressed. Should monitoring or engagement demonstrate that whelk fishing face operational challenges within the wind farm layout, the Applicant is committed to working with affected fishers to explore practical solutions. These may include support for gear reconfiguration, adaptations in operational protocols, or wider collaboration to help futureproof

the fleet as the offshore renewable energy sector evolves. The proposed monitoring and mitigation to maximise the potential for coexistence is further explained in the updated **Fisheries Management and Mitigation Strategy (FMMS)** submitted with the Applicant's FIR Response and **Section 12.10** of the **EIAR Addendum (Part 1)**.

489. The level of displacement is predicted to be not significant, as the areas temporarily lost are small in comparison to the wider extents of the fisheries and will be mitigated through reasonable, justifiable and evidence-based cooperation agreements with affected fishermen who can demonstrate a legitimate economical dependency on the CWP Project offshore development area wherever possible. However, the Applicant recognises the importance of understanding and addressing the potential displacement of fishing activity during the operational phase of offshore renewable energy (ORE) developments. In particular, Marine Institute's concerns that displacement may lead to increased fishing pressure and competition in neighbouring areas is acknowledged.

490. In response, the Applicant proposes to work collaboratively with the Marine Institute, fishing industry representatives, and other Phase 1 developers to support the proactive implementation of inshore Vessel Monitoring Systems (iVMS) on selected fishing vessels operating within, around, and adjacent to the development areas. This initiative will enable real-time and continuous monitoring of fishing activity across key spatial zones, including array areas, cable corridors, and surrounding grounds, and will provide essential baseline data ahead of construction, against which future changes in fishing effort or redistribution during construction and operation can be measured.

491. To ensure that monitoring, assessment, and interpretation of potential displacement are transparent, credible, and science-led, the CWP Project, together with other Phase 1 developers suggest engagement with an independent scientific body, such as the Marine Institute and/or a recognised academic institution, to lead on the design and delivery of data collection and analysis. This partnership will ensure that findings are based on neutral, evidence-based methodologies and can be trusted by all stakeholders, including regulators and the fishing community. As part of this commitment, the Phase 1 developers would jointly fund a dedicated PhD studentship focused specifically on investigating cumulative displacement effects arising from multiple offshore wind developments in the Irish Sea. This research will explore spatial and temporal interactions between fishing activity and offshore infrastructure, and contribute to national understanding of co-existence, with a view to supporting future policy development, fisheries adaptation planning, and mitigation strategies. Further details on the approach to mitigation for cumulative displacement are provided in the **CEA Report (Part 2),** and the updated **FMMS** submitted with the Applicant's FIR Response.

2.12.2 Item 12b

'The Commission has the following queries in relation to the submitted Fisheries Management and Mitigation Strategy (FMMS) and Chapter 12 (Commercial Fisheries).

i. The applicant is requested to further clarify and explain the term "fleet level" in the conclusion of consideration of impacts within the FMMS and Chapter 12. Associated with this, and the uncertainties raised in relation to co-existence, the applicant is requested to clarify whether localised or individual impacts on individual fishers or vessels could be considered to be of such significance to merit and/or justify access to any form of disturbance payment strategy, which can often be incorporated within FMMS's and if this could arise what form of evidence base would be required to be provided by affected parties. In the event that this request cannot be fully addressed by the applicant, the applicant is requested to provide explanation and justification for the response provided.

ii. The applicant is requested to clarify whether there will be a dispute resolution process included within the FMMS, and if so to provide an outline as to its nature.'

Response

492. In response to Item 12(b)(i), the Applicant confirms that the commercial fisheries assessments undertaken as part of EIAs are conducted at the fleet level, in line with recognised EIA methodology. In this context, a fleet is defined as a group of vessels of the same nationality, using the same gear type, and targeting the same species. The term refers specifically to those vessels active within or adjacent to the development area, rather than the entire national fleet segment. This allows for an appropriate and spatially relevant evaluation of potential impacts on the fishing activity most directly interacting with the project.

493. While the EIA significance is determined at fleet level, the Applicant recognises that individual fishers may still experience localised or short-term disruption to their activities, particularly during the construction phase. In such cases, the Applicant will endeavour to enter into reasonable, justifiable and evidence-based cooperation agreements with affected fishermen who can demonstrate a legitimate economical dependency on the CWP Project offshore development area wherever possible. These cooperation payments will be governed as described in updated **FMMS**.

494. To provide a robust and transparent evidence base for both baseline understanding and any future verification of impacts, the Applicant, along with other Phase 1 developers, propose to work in collaboration with the Marine Institute and the fishing industry to support the proactive implementation of iVMS on selected vessels operating within and around the development area. This initiative will enable real-time and long-term monitoring of fishing patterns within the array site and OECC areas, as well as adjacent fishing grounds. The resulting dataset will also serve as an independent baseline ahead of construction, providing a reference against which any short-term displacement or redistribution of fishing effort can be objectively assessed.

495. The Applicant does not anticipate significant operational-phase impacts, as there is no legislation restricting fishing within operational offshore wind farms. **Appendix 12-A Evidence of fishing within OWF array areas** of the **EAIR Addendum** provides evidence of resumption of fishing within operational wind farms in the UK. Nonetheless, recognising stakeholder concerns about the practicality of co-existence, CWP is committed to monitoring CPUE of whelk and fishing activity trends to provide confidence that co-existence is being achieved.

496. Where evidence indicates that current fishing methods cannot be effectively or safely deployed within the operational site, the Applicant will work collaboratively with affected fishers to explore practical solutions such as gear reconfiguration support, technical adaptations, or cooperative initiatives to futureproof the fleet in alignment with the evolving offshore energy and marine spatial context.

497. As outlined in the updated **FMMS**, if monitoring indicates evidence of cumulative displacement, the Applicant is committed to considering suitable mitigation at that point in time. However, it is recognised that the scale and nature of any cumulative effects will depend on which offshore wind projects ultimately secure consent, and, if consented, their respective construction and operational timelines. Given this current uncertainty, the Applicant cannot commit to detailed, collaborate cumulative mitigation measures at this stage. Instead, the Applicant will keep the requirement for cumulative mitigation under review and, if monitoring and evidence demonstrate significant cumulative displacement, will work collaboratively to develop and implement proportionate measures at the appropriate time. ork collaboratively with other Phase 1 projects, and regulators to discuss proportionate measures.

498. In response to item 12(b)(ii), the Applicant confirms that a dispute resolution process is included in the updated **FMMS**.

499. The Applicant confirms that it will follow the approach outlined in the Seafood / ORE Working Group (2024) Dispute Resolution Mechanism (DRM) (or as updated/ replaced closer to the time of construction). This DRM provides a structured, voluntary mediation process designed to resolve

disagreements between the offshore renewable energy and seafood sectors where direct engagement has not led to resolution.

500. The **FMMS** has been updated to reflect this commitment, and the dispute resolution process will follow the principles and steps outlined in the DRM guidance, including:

- Initial engagement and effort to resolve: Before invoking the DRM, parties are expected to engage meaningfully and attempt to resolve issues directly, in line with the Seafood / ORE Engagement Summary Guide.
- Issue identification and referral: Where resolution cannot be achieved, the parties can agree to refer the specific matter(s) to the DRM process, identifying the issues to be mediated.
- Appointment of a mediator: The parties may jointly appoint a mediator from the established panel, or request the panel lead to make an appointment on their behalf.
- Mediation process: The mediation will be conducted in accordance with the Mediation Act 2017, following the process outlined in the DRM. It will be voluntary, confidential, and impartial, with parties retaining control over the outcome.
- Resolution or withdrawal: If the mediation is successful, a settlement agreement is signed and implemented. If not, parties retain the right to re-engage in mediation or pursue other legal remedies, as their rights remain unaffected by participation in the DRM.

501. CWP supports this structured, transparent mechanism as a fair and constructive way to address disputes that may arise during the project's engagement with the fishing industry and believes its inclusion strengthens the integrity and credibility of the **FMMS**.

2.13 Item 13 Marine Archaeology

2.13.1 Item 13a

'In relation to the Underwater Archaeology comments issued from the DAU, it is stated that much of the advice provided during pre-planning meetings has not been incorporated into the final EIAR. The applicant is invited to address this issue by altering or augmenting the relevant EIAR sections and/or providing detailed justification as to how the methodology set out in the suggested approaches/mitigation address the DAUs concerns and requirements in relation to underwater archaeology.'

Response

502. Following comments issued from the DAU, CWP engaged with the National Monument Service (NMS) on 20 October 2025 and 23 January 2026 to clarify any outstanding requirements. Matters raised by the NMS in relation to Underwater Archaeology are detailed in **Section 5.4** of the **Observations Response Document**. During this consultation the NMS noted the requirement for a Marine Archaeology Management Plan (MAMP). The Applicant subsequently drafted and issued a draft MAMP to the NMS for approval. On 25 February 2026 the NMS confirmed their acceptance of the draft MAMP. The draft MAMP is included in the Applicant's FIR Response (**Marine Archaeology Management Plan**), and NMS's acceptance of the draft MAMP is provided in **Appendix M – NMS approval of draft Marine Archaeology Management Plan (MAMP)** of this **FIR Response Document**. Details on the consultation with the NMS is provided in **Appendix B** of this **FIR Response Document**.

503. The Applicant is of the opinion that these alterations are proportionate, address the concerns raised by the DAU, and welcomes the confirmation provided by the NMS that the MAMP is appropriate and adequately addresses the concerns identified.

2.13.2 Item 13b

'The applicant is invited to review in detail the DAUs comments in relation to underwater archaeology and its recommended conditions in the event of favourable consideration of the project, in terms of their potential impacts on project design, construction methodologies and timeframes. In particular in this regard the applicant is requested to comment on the recommendation to implement archaeological exclusion zones at the locations of all shipwrecks and geophysical anomalies of archaeological potential and to either identify the locations of, or set out a working methodology for identifying, such features and consider any potential implications on project design and environmental impacts that may arise. Any response to this issue should include mapping/layouts showing proposed project infrastructure in the context of prospective shipwrecks, features of archaeological origin and any associated archaeological exclusion zones while also maintaining other project design requirements such as search and rescue requirements and the established flexibility opinion.'

Response

As noted previously, CWP engaged with the NMS and have addressed those comments in the **Observation Response Document,** the **EIAR Addendum** and the supporting **MAMP**.

504. Archaeological Exclusion Zones around known features of archaeological interest (i.e. A1 and A3 classified geophysical anomalies) which have high archaeological potential have been recommended (see **Volume 3, Chapter 14 Marine Archaeology and Cultural Heritage** of the EIAR). For seabed features of likely/possible archaeological interest (i.e. A2 classified geophysical anomalies), there is currently insufficient information to confirm their date and character. These anomalies will be avoided by permanent and temporary offshore infrastructure and locational flexibility (Limits of Deviation), wherever possible. Avoidance of these seabed features by micro-siting has informed the current design process, as presented in **Figures 1-16, Appendix 2 of the MAMP**. If avoidance is not possible, further appraisal is proposed prior to construction, to confirm the character. If further information is exposed as a result of investigations undertaken prior to construction, and the character and date of a wrecking event is confirmed, the baseline data will be reviewed and mitigation measures updated accordingly, in consultation with the NMS.

2.14 Item 14 Bats

2.14.1 Item 14a

'In consideration of bats (onshore and migratory) the DAU notes that based on published data, it considers that the main risk associated with the proposal arises in relation to collision/barotrauma during the operational phase and that the potential for impacts in relation to four bat species (Leisler's bat, Soprano pipistrelle, Common pipistrelle, and Nathusius' pipistrelle) cannot be ruled out. The DAU notes the limited nature of the data provided. Whilst the Commission acknowledges that there is currently no accepted standard for the assessment of bat activity in relation to offshore wind energy developments in Ireland, it is considered that the methodology outlined in Chapter 13 of the EIAR is insufficient, especially in comparison to the level of assessment that would be considered best practice for the assessment of onshore wind energy developments. While the limitations outlined in Chapter 13 are noted, survey techniques other than those employed are available. Boat-based monitoring, for example, is utilised or proposed by other offshore proposals currently before An Coimisiún Pleanála, which suggests that further survey effort is possible. Furthermore, the Commission notes the protected status of bats and their sensitivity to developments such as that proposed. The applicant is, therefore, requested to present further, more recent, baseline data. This baseline information should include echolocation/activity data from the array area, particularly within an established migratory period.'

Response

505. The Applicant agrees with the summary of bat species potentially impacted and the potential impacts. These are set out in **Volume 3**, **Chapter 13 Offshore Bats** of the EIAR. The impact assessment focuses on species known to or considered likely to use the offshore environment which include the four species outlined above (Leisler's bat, Soprano pipistrelle, Common pipistrelle, and Nathusius' pipistrelle).

506. **Chapter 13 Offshore Bats** of the EIAR set out the baseline environment which was informed by data collected by the Applicant and Dublin Array OWF, and additional background data provided by NPWS on 14 March 2022. As outlined in **Table 13-1** of **Chapter 13 Offshore Bats** NPWS agreed via email dated 8 March 2022 that the survey methods were suitable given the limitations of boat-based surveys and the distance of the array site from shore. NPWS agreed with the locations, duration and timing of the headland surveys and welcomed the collaboration with the Dublin Array project as outlined within the EIAR. The headland surveys were based on the Eurobats guidance (Rodrigues *et al.*, 2014) to look for peaks in activity which could relate to migration on either side of the sea. While it is noted that the survey methods differ from other projects, the CWP array area is also further from land/potential roosts compared to the other proposed offshore wind developments and lacks available structures suitable for deploying offshore detectors.

507. However as requested, the applicant has provided additional baseline data from 2025, including a repeat of the 2022 headland survey and the use of a dedicated vessel to capture data from within the array site (see **Table 2**). Full details of the additional surveys including the survey methods and results are provided in **Appendix 13-A 2025 Baseline Offshore Bat Survey Report** of the **EIAR Addendum**.

508. The 2025 headland surveys followed the same methodology as the 2022 surveys. The Eurobats guidance states that surveys from land should "*include long-term automatic surveys*" however the timing of land based surveys is not given. Despite some technical issues during the 2025 surveys (as described in Appendix 12-A), a substantial dataset was gathered in both 2022 and 2025. Between 140 – 158 nights per location were captured in 2025. The combined dataset is considered in line with the long-term automatic surveys approach set out in the Eurobats guidance.

509. The sound analysis methods and parameters used in the 2022 analysis was repeated in the analysis of the 2025 recordings to allow for increased comparability across the survey years. The data from the updated headlands surveys, as provided in **Appendix 13-A** of the **EIAR Addendum** is considered similar to the results from 2022, in terms of species locations and overall passes.

510. The 2025 boat based surveys included nights which were safe to survey across a six week period in May – June (within the Spring migratory window) and September – October (within the Autumn migratory window). Therefore, data was collected within two migration periods and the Applicant considers that the request for information to include echolocation / activity data from the array site, within an established migratory period, is fulfilled.

511. During this time two Song Meter 4+bat full spectrum (SM4+) automatic bat detectors were deployed on a vessel which moved between three pre-set sampling locations within the array site, moving either from north-south or south-north across the array site where and when safe to do so. At the specified locations, the vessel stopped and drifted to minimise noise which could interfere with the detection of bat passes, before continuing to the next location. The survey aimed to include each of the three locations for between 2 – 4 hours each survey night, however the length of time at each location depended on the sea conditions. The amount of time spent at each sampling location and time within the array site is included in **Appendix 13-A** of the **EIAR Addendum**.

512. No bat passes were recorded within the array site, however, bat passes were recorded within the harbour. This is consistent with existing research as highlighted within the literature review presented within **Chapter 13 Offshore Bats** of the EIAR.

513. The Applicant considers that the request for more recent baseline data, has been satisfied. The 2025 survey data validates the baseline characterisation in the EIAR, and therefore the impact conclusions remain unchanged and not significant in EIA terms.

2.14.2 Item 14b

'With regard to artificial lighting at night, the applicant is requested to provide a more comprehensive assessment of the potential effects on bats due to artificial lighting at night within the array area. The applicant is requested to provide an assessment (with reference to appropriate lux contours) to determine the extent to which proposed lighting may disturb or displace bats.

Response

514. A LUX contour drawing has been provided in **Appendix 13-B Lux Assessment Report** of the **EIAR Addendum** showing down to 0.2 LUX from an indicative WTG model.

515. The updated assessment presented within **Section 13** of the **EIAR Addendum (Part 1)** includes a review of the impacts of the proposed lighting on bats, based on the LUX contour drawing and the baseline survey results from both 2022 and 2025.

516. The best practice measures from the Bat Conservation Trust and Institute of Lighting Professionals "onshore bats and lighting guidance" have been included throughout the design of the project where possible. The lighting is as directional and as minimal as possible, with warm temperature lighting chosen and green or cool coloured lighting avoided. The aircraft lighting is red and the marine navigation lighting chosen is yellow, while the name plate lights are small and directional, therefore the 1 LUX contour does not extend further than 40 m. The aircraft lighting is red and the marine navigation lighting chosen is yellow, while the name plate lights are small and directional, therefore the 1 LUX contour does not extend further than 40 m beyond the centre of the WTG column while 0.2 LUX extends to up to 65 m from the centre of the WTG column. Due to the proposed layout, turbine specification and specified lighting, there will be dark corridors within the array allowing for passage of light shy species between the WTGs. Following the inclusion of the LUX contour drawing the assessment of operational phase lighting impacts on bats in the offshore environment has been updated within **Section 13.10** of the **EIAR Addendum (Part 1),** however the final conclusions of Negligible impact on bats (and not significant in EIA terms) remains unchanged.

2.14.3 Item 14c

'The DAU submission recommends that further information be provided in relation to effective mitigation measures to reduce and minimise potential impacts on migrating bats. The applicant is therefore requested to examine the need for mitigation measures (in addition to operational-phase monitoring) to reduce potential impacts on bats. The applicant is requested to provide details in relation to proposed mitigation measures or adaptive management, which could, for example, include measures such as curtailment or feathering of blades under certain conditions and/or at certain times which are to be specified by the applicant.'

Response

517. Following the requested further surveys (as outlined in Item 14a) no bat passes were recorded within the array site. In line with the FIR on mitigation measures, a review of recent literature and other publicly available information was undertaken to further supplement the baseline dataset, as included

in the **Section 13.6** of the **EIAR Addendum (Part 1)**. However; there remains no clear evidence of bats moving through the array site. As such no mitigation is recommended at this time, however monitoring is described within the **IPPEMP**.

2.14.4 Item 14d

'The applicant is requested to clearly define the units / indices used to describe any bat activity recorded throughout Chapter 13. This is sometimes unclear within the information currently before the Commission. For example, Chapter 13 of the EIAR (para. 99) states that Table 13.14 presents data in "migratory hours rather than nights" but the subsequent discussion appears to indicate that total number of registrations are used, and not hourly or nightly averages.'

Response

518. The terms used within **Section 13.10** of **Volume 3, Chapter 13 Offshore Bats** of the EIAR are defined below to add further clarity to the submitted report.

519. Bat passes: As per **Chapter 13 Offshore Bats** of the EIAR, a bat pass was defined as a sequence of bat pulses captured on a 15 second sound file. One sound file was counted as one bat pass. Different species within the same 15 second sound file were counted as separate bat passes. An individual bat can pass a particular feature on several occasions while foraging. It is therefore important to acknowledge that bat passes are an index of bat activity rather than a measure of number of individuals in a population. The term 'calls' is also used within the text when referring to bat passes, particularly when referring to specific recordings or passes by unidentified species. This is used in **Table 13-13** of **Chapter 13 Offshore Bats** of the EIAR.

520. Relative bat activity: The relative bat activity detailed in **Chapter 13 Offshore Bats** of the EIAR, is the Bat Activity Index (BAI) as outlined in Eurobats Guidance (Rodrigues et al., 2015). BAI was calculated from the mean number of bat passes per night across the survey season, based on the number of nights surveyed across all detectors over both spring and autumn. A migratory BAI is also used within **Chapter 13 Offshore Bats** of the EIAR including within **Tables 13-15** and **13-16** (these have now been replaced with **Table 13-D** and **Table 13-E** respectively within the **EIAR Addendum (Part 1)**). **Table 13-17** provides overall bat passes by species at each location for the Dublin Array dataset while **Tables 13-18** provides the potentially migratory passes recorded within the Dublin Array dataset and the comparison with the overall number of passes. **Table 13-19** provides the BAI for potentially migratory passes by species recorded within the Dublin Array dataset comparative to the overall BAI.

521. Migration parameters or conditions potentially suitable for migration: As per **Chapter 13 Offshore Bats** of the EIAR bat migration is considered to be most likely when temperatures are above 13°C and when wind is below 5 m/s and wind direction is favourable. All easterly winds would aid migrations to Ireland from Wales while all westerly winds excepting south-southwesterlies would aid in travel between Ireland and Wales. As such we have included indications for migration towards Ireland from Wales as easterly winds, as these would be the most direct, while westerlies would be the most direct from Ireland towards Wales. This is further defined in **Chapter 13 Offshore Bats** of the EIAR based on timing of calls during wind directions suitable for migration. As bats are estimated to take at least 103 minutes to cross the Irish sea, calls within 103 minutes of sunset and in wind directions unsuitable for migration out of the country of detection, are not considered migratory. This is because calls under these conditions would involve bats either flying against the prevailing wind to migrate from the country of detection or having departed the country of origin during daytime/flying at faster speeds than current research indicates. However, calls within 103 minutes of sunset during weather conditions and wind directions suitable for migration out of the country of recording are considered to be from potentially migratory bats.

522. In summary, as outlined in **Chapter 13 Offshore Bats** of the EIAR the following parameters were identified as suitable for migration and were used in the assessment to identify passes during conditions suitable for migration and the number of potentially suitable migratory hours;

- Average overnight temperature above 13°C;
- Average wind speed below 5 m/s;
- Prevailing overnight wind direction either easterly or westerly; and
- Calls more than 103 minutes after sunset (or calls within 103 minutes of sunset during winds suitable for outwards migration).

523. The proportion of potentially migratory passes: As detailed in **Chapter 13 Offshore Bats** of the EIAR, to assess the proportion of activity which was migratory, the number of bat passes recorded for each species during potentially migratory conditions was divided by the total number of nights surveyed. For the CWP baseline the number of nights surveyed was 665 nights, while for the Dublin Array OWF data set included 596 nights of data.

524. In **Table 13-14** of **Chapter 13 Offshore Bats** of the EIAR "Species passes by suitability for migration" includes the number of passes recorded during potentially suitable migratory conditions (hours when the above parameters were met) as well as the total number of passes during unsuitable conditions for migration. In this way it allows for the calculation of the proportion of potentially migratory passes to be calculated. As such the records of activity during hours suitable for migration is given, as opposed to nights which were fully suitable for migration on both sides of the sea the whole night through, as for the duration of the 2022 survey window this only occurred on one night (28 August). Similarly, the BAI comparison of potentially migratory passes compared to overall BAI is provided in **Tables 13-15** and **Table 13-16** of **Chapter 13 Offshore Bats** of the EIAR for Ireland and Wales respectively, provide the averaged values (these have now been replaced with **Table 13-D** and **Table 13-E** respectively within the **EIAR Addendum (Part 1)**). Therefore, both BAI and pass values are provided within the EIAR.

525. As highlighted above, a variety of terms were used in the 2022 analysis, to avoid this confusion in the 2025 analysis, a more concise list of variables and therefore terms has been used as detailed in **Appendix 13-A** of the **EIAR Addendum**.

2.14.5 Item 14e

'The applicant is requested to provide a revised discussion of results. The submitted documentation appears to contain discrepancy. For example, the applicant's analysis suggests that a total of 2,745 Leisler's Bat registrations recorded in 2022 at Irish and Welsh coastlines were possibly associated with migratory behaviour, with a peak of 288 passes in any one night, whereas Table 13-15 provides a maximum number of potentially migratory bat passes per night of 164. Information on the presence of 'feeding buzzes', observations regarding clustering of 'bat passes' etc. may be helpful to describe in relation to any offshore data.'

Response

526. The text provided in **Volume 3, Chapter 13 Offshore Bats** of the EIAR is based on the times and wind direction of the different passes, to identify nights with suitable conditions for migration, and potential peaks in activity of potentially migratory species. In this way the results look at the peaks across the four detectors deployed in Ireland compared with the four detectors in Wales. **Table 13-15** of **Chapter 13 Offshore Bats** of the EIAR is based on the peaks per detector location, where 164 Leisler's bat passes in a single night suitable for migration was the peak on one of the detectors in

Ireland. Within the **EIAR Addendum Table 13-15** and **Table 13-16** have been replaced with **Table 13-D** and **Table 13-E** respectively to further clarify the differences between the text and the table.

527. Following the completion of the 2025 survey, further details of the initial analysis for indications of potential migratory behaviour of the 2022 data is provided in the **Appendix 13-A Offshore Bat Survey Report 2025** of the **EIAR Addendum** to enable detailed comparison across the surveyed years.

528. **Section 13.6** of the **EIAR Addendum (Part 1)** provides clarification as to how the results have been presented and includes corrected values where necessary.

2.14.6 Item 14f

'In view of the identified potential for effects associated with the proposed development in terms of the operational and maintenance phase of the project (e.g. due to barotrauma and collision risk), and with recognition of the scarcity of relevant scientific information (especially in an Irish Sea context), a robust operational phase monitoring plan is appropriate. The Commission notes the content of the 'In Principle Environmental Monitoring Plan', submitted in support of the current application, however, it is considered that the extent and range of monitoring proposed in that document is not sufficient. The plan is focused on identifying potential roosting activity only, and states that "where possible the offshore platforms including the OSS or vessels will be used for bat monitoring within the array site during migration seasons". The applicant is therefore required to provide specific information on the details of the proposed operational phase monitoring and reporting which will include a firm commitment to the provision of sufficient resources and the carrying out of monitoring activities which would be reasonably capable of identifying potential effects on bats within the array area due to collision/barotrauma or displacement due to lighting.'

Response

529. Further details regarding the proposed monitoring is included within the updated **IPPEMP** which aims to further clarify the Applicants commitment to monitoring of bats in the offshore environment for three operational years (i.e. covering three calendar years from the date of first power generation). The monitoring will include automated bat detectors on 10 of the WTGs including detectors at the lowest tip edge of the WTG base (or on the guard rails) and at the nacelle. Additional detectors will be deployed on each of the three OSS to further increase the coverage across the array site. The detectors will be maintained at least once each year ahead of the start of the bat season (i.e. before April) and the data automatically uploaded via an onsite server to enable regular analysis. At the end of each year a report of the findings will be produced and submitted to the relevant Regulatory Authority for review

2.14.7 Item 14g

'The applicant is requested to provide a revised assessment of potential effects on bats offshore, which is based on a more comprehensive and robust baseline dataset. The Commission highlights that the 'receptor sensitivity' applied in the assessment of effects may not be consistent with the criteria applied in Table 13-7 given for example that bats are unlikely to avoid or adapt to collision risk and they should arguably be considered as a receptor of international importance given their status on Annex IV of EU Habitats Directive.'

Response

530. **Table 13-7** of **Volume 3, Chapter 13 Offshore Bats** of the EIAR, provides the geographical context relating to the evaluation of an Important Ecological Feature (IEF) while **Table 13-8** provides the criteria for determining receptor sensitivity.

531. The revised assessment within **Section 13.10** of the **EIAR Addendum (Part 1)** includes the data from the 2025 surveys. However, the sensitivity of the receptors has not been revised as it is considered consistent with the criteria applied in **Table 13-8** of **Chapter 13 Offshore Bats** which provides the criteria for determining receptor sensitivity within the EIAR.

532. The EIAR assessment is based on the use of the proposed development area by bats. Following further surveys in 2025 there is no evidence of bat use within the array site. In the absence of recorded presence and given the distance of the array site from the shore (13 – 22 km), the bat population likely to be impacted by the proposed development is not considered sufficient to meet the criteria for SAC selection and therefore is not considered of international importance.

533. It is also noted that while all bats are protected under Annex IV of EU Habitats Directive, the 'Action Plan for the Conservation of All Bat Species in the European Union: 2018 – 2024' includes no Natura 2000 sites for any of the bat species potentially present within the array site (Leisler's bat, Soprano pipistrelle, Common pipistrelle, and Nathusius' pipistrelle). As such while bats themselves are of international importance the population of bats potentially impacted by the proposed development, even when applying the precautionary approach, is considered of local value as all species which may be using the area (excluding Nathusius pipistrelles) are considered to be widespread and common. However, given the potential use of the offshore environment by migratory species there is potential for National impacts. As identified in **Table 13-8** of **Chapter 13 Offshore Bats** of the EIAR this would result in potential receptor sensitivity of up to medium.

534. While individual bats are not able to adapt to the potential collision (and therefore a medium sensitivity may be applicable), the tolerance of the receptor is different across the species, with Leisler's bat, Soprano pipistrelle and Common pipistrelle being significantly more widespread across Ireland compared to Nathusius' pipistrelles. Leisler's bat, Soprano pipistrelle and Common pipistrelle bats are common species for which a limited increase in mortality risk is unlikely to have a significant impact on population status and are therefore considered of Low sensitivity to potential impacts from the proposed development. Nathusius' pipistrelle bats are less common and therefore considered to have moderate population vulnerability to the impact and so are considered to be a medium sensitivity receptor.

2.14.8 Item 14h

'The DAU submission highlights that the deliberate disturbance of bats (which are listed under Annex IV of the Habitats Directive (92/43/EEC)) would require derogation under Article 16 of the Habitats Directive. In line with recent guidance from Department of Housing, Local Government and Heritage, the applicant is requested to consider the need for Regulation 54 Derogation and, if required, a copy of the Regulation 54 Derogation should be provided.'

Response

535. In *Doyle and Ors v An Coimisiún Pleanála [No. 3] [2026] IEHC* 156, the High Court held that "*it is settled law that a derogation licence should be obtained before a development consent if derogation is probable as opposed to being a mere possibility*". It is considered that derogation is not required for bats under Regulation 54 as a result of construction or operation of the CWP Project based on that

legal test. Following site specific bat surveys across the CWP study area, combined with the very low risk of any meaningful impact, the inclusion of appropriate and necessary mitigation measures to avoid potential disturbance and mortality any disturbance is not probable, and a derogation under Regulation 54 is not required or sought for offshore bats. Furthermore, there is no existing infrastructure within the array site which would be suitable for roosting or resting bats. Any potential features suitable would either be vessels utilised in construction, operation and decommissioning of the wind farm or the proposed development itself. The WTG and offshore substations are all constructed in sections, sealed to prevent weather ingress and damage, as such the assembly will not create suitable crevices for favourable bat roosting conditions.

536. As highlighted within **Chapter 13 Offshore Bats** of the EIAR; due to the lack of recording or detailed research into the occurrences of bats on vessels or offshore platforms, the suitability of chosen roosts and the condition of the bats while utilising such structures is not known. However, open roosting is dangerous to bats with increased risks of predation. Bats are vulnerable to disturbance during roosting, with risks of predation further increasing if disturbed during daytime, and are vulnerable to shortages in fresh drinking water, poor weather and prey availability. The extent to which bats may rest on vessels is considered to be low, with only occasionally reported incidences, most being *ad hoc* reports from the owners / operators of ferries or the workers on offshore oil platforms or WTGs (Petersen et al., 2014), (Lagerveld, Jonge Poerink and Geelhoed, 2021). Such reports are often associated with migration, though could also be from bats foraging offshore or elsewise blown offshore by wind.

537. However, in the interests of environmental best practice, both in terms of animal welfare and future research, as there is the possibility of unexpectedly encountering roosting bats, additional mitigation monitoring is described in the updated **IPPEMP.** The mitigation would include the production of and adherence to a Project Environmental Management Plan (PEMP) which will include what to do in the unlikely event of encountering a bat – do not disturb it, take a photo of the location if possible and contact the bat licenced Ecological Clerk of Works (ECoW) for advice. Depending on the location of the roosting bat (principally the level of exposure or visible injuries) it may be necessary to take the bat into care prior to release if needed. This has occurred on offshore WTGs elsewhere when injured bats have previously been found on the floor of turbines (Natural England, 2025). Where the bat is deemed not at risk it would not be disturbed. The disturbance of individual bats if it did occur would be incidental and would have no impact at a population/conservation level of the species. As such no derogation licence is considered necessary in this instance.

2.15 Item 15 Aviation, Military and Radar

2.15.1 Item 15a

'While the provisions of Chapter 17 and its associated appendices are noted, as referenced in the submission of the Irish Aviation Authority, the applicant is requested to confirm through consultation and engagement with the Dublin Airport Authority and Air Nav Ireland (the national Air Navigation Service Provider (ANSP)) that the proposed offshore wind farm and the associated construction equipment will not give rise to potential impacts on instrument flight procedures and communication, navigation and surveillance equipment at Dublin Airport. '

Response

538. The Applicant has engaged with Air Nav Ireland and Dublin Airport Authority (DAA) to confirm any potential impacts on instrument flight procedures and communication, navigation and surveillance equipment at Dublin Airport. Following consultation in October 2025, AirNav Ireland and DAA confirmed in a letter dated 23 October 2025 that they have no concerns regarding potential impact on

instrument flight procedures, obstacle limitation surfaces or communication, navigation and surveillance facilities at Dublin Airport. This letter is available in **Appendix N – Letter from AirNav Ireland r.e. Dublin Airport** of this **FIR Response Document**.

2.16 Item 16 Marine Infrastructure

2.16.1 Item 16a

'When discussing direct effects on Marine Infrastructure and construction methodologies (Section 18.10, paragraphs 110 to 114) the EIAR references cables, but refers to the sensitivity of existing operational cables and pipelines to direct damage being high due to their economic value and importance. Figure 18.3 shows that the three proposed offshore cables will cross over a gas pipeline, an ESB power line, and labels 'Sewer twin pipes' (although the locations of these are not clear on the figure). Admiralty charts show sewer lines running between Ringsend and Dun Laoghaire that will be crossed by the OECC, but do not show the gas pipeline indicated in Figure 18.3. These infrastructure assets are all located within the South Dublin Bay SAC and South Dublin Bay and River Tolka SPA. The applicant is requested to provide greater clarity in relation to the applicability, efficacy, and implementation of mitigation measures that will facilitate the construction of the proposed offshore export cables while also ensuring the protection of the existing gas pipeline, sewers and existing electrical cabling as well as the integrity of the protected sites and species at this location. Should additional site specific mitigation measures, or construction methodologies be required having regard to the nature and locations of proposed crossings, comprehensive details should be submitted and amendments made to the relevant sections of the EIAR and NIS where interactions occur. The applicant is further requested to confirm that the relevant owners/operators of the existing infrastructure referenced above have been liaised with in designing the proposed development and that they are satisfied with the proposed construction methodologies and mitigation measures in the vicinity of their assets.'

Response

539. The Applicant wishes to acknowledge several instances in **Volume 3**, **Chapter 18 Material Assets - Marine Infrastructure** of the EIAR where general reference is made to potential effects to third party cables, when in fact the intended reference in all such cases is to both cables and pipelines, and should be read as such. The Applicant wishes to clarify that the identification and assessment of effects on marine infrastructure includes relevant third party cables and pipelines, as is noted in the list of pipelines presented in **Table 18-7** of the EIAR. The proposed mitigation measures described in EIAR **Volume 3**, **Chapter 18 Material Assets - Marine Infrastructure** applies to all relevant third party cables and pipelines.

540. In response to item 16b (see below), the Applicant has updated EIAR **Volume 4**, **Appendix 4.2 Preliminary offshore export cable crossing** to include a figure showing the locations of other marine infrastructure and cable / pipeline crossings in the study area more clearly, particularly within the South Dublin Bay SAC and South Dublin Bay and River Tolka SPA. The updated appendix is provided as **Appendix 4-A Updated preliminary offshore export cable crossing schedule** of the **EIAR Addendum**. The Applicant would note that the figure in **Appendix 4-A** is consistent with the description of the existing environment in **Volume 3**, **Chapter 18 Material Assets - Marine Infrastructure** of the EIAR and therefore does not change the scope or conclusions of the assessment on which this is based, nor the relevant mitigation which remains as per the EIAR.

541. In regard to the crossing of existing assets within the South Dublin Bay SAC, the Applicant has assessed the potential direct and indirect impacts on all relevant site attributes, including 'Mudflats and

sandflats not covered by seawater at low tide. This assessment is provided in **Section 2.1** of **Volume 4 - Assessment of Implications for Special Areas of Conservation** of the NIS. This section of the NIS has also been updated in response to the Commission's FIR and is presented in **NIS Addendum (Part 1** and **Part 2)**. It is noted in the assessment that no above surface cable protection will be installed within the South Dublin Bay SAC, and therefore no permanent loss of habitat will occur. Temporary direct and indirect effects from seabed preparation, cable laying and vehicle compaction are assessed in detail within the abovementioned sections of the NIS and **NIS Addendum.**

542. The Applicant also confirms that **Table 18-17** (Primary Mitigation Measures) in **Volume 3**, **Chapter 18 Material Assets - Marine Infrastructure** of the EIAR commits to the following: '*Consultation and liaison will be undertaken with asset owners and other energy infrastructure operators, as required. This is proposed to promote and maximise cooperation between parties and minimise spatial and temporal interactions between simultaneous activities'*. The Applicant considers this to be appropriate and undertakes to develop crossing agreements with the relevant operator's post-consent when further location detail is available. This accords with the Applicant's experience of reaching such agreements following consent and being able to provide owner/operators an appropriate level of detail.

543. In this regard, the Applicant has been engaging with Uisce Éireann, EirGrid/ESBN, Gas Networks Ireland and telecoms operators with existing/planned assets both onshore and offshore within Dublin Bay for the past number of years. This has included engagement on the Applicant's early-stage development process and associated optioneering along with periodic updates on survey works and future design development regarding crossings. This engagement process has now advanced to the establishment in 2026 of a dedicated Dublin Bay working group which sits under EirGrid's existing Dublin Infrastructure Forum. This working group will allow for enhanced cross party collaboration in the offshore area of Dublin Bay on topics such as site investigations, offshore construction / future development and the coordination of asset crossings. A letter from Uisce Éireann confirming this position is included in Schedule 4 of the **Planning Documents** provided with the planning application.

2.16.2 Item 16b

'The applicant is requested to provide a scalable map showing and labelling the locations of all cable route crossings listed in Appendix 4.2 of the submitted EIAR and to provide further details and references to the specific prevailing conditions at each of the locations (seabed, subsurface seabed, intertidal zone, etc.) and specify in each situation what means of crossing existing infrastructure is proposed, what potential site specific impacts could arise and whether any specific/unique construction methodologies or mitigation measures can be adopted to minimise impacts arising. The applicant is further requested to amend the EIAR and NIS as relevant to account for these additional construction and/or mitigation details.'

Response

544. In response to this request EIAR **Volume 4**, **Appendix 4.2 Preliminary offshore export cable crossing** has been updated to include a figure to show the locations of all cable crossings. The updated appendix is provided as **Appendix 4-A Updated preliminary offshore export cable crossing schedule** of the **EIAR Addendum**.

545. The Applicant notes that the figure in **Appendix 4-A** is consistent with the description of the existing environment in **Volume 3**, **Chapter 18 Material Assets - Marine Infrastructure** of the EIAR, and therefore it does not change the scope of the assessment on which this is based.

546. As noted in response to item 16a the Applicant has made a clear commitment to mitigation for offshore export cable crossings which include, *inter alia*, consultation and cooperation with asset owners and other energy infrastructure operators as necessary.

547. The design and methodology of the offshore export cable crossings will be confirmed in agreement with the asset owners. However, it is likely that concrete mattresses will be placed over the existing asset to form a separation layer. The export cable will be laid across these concrete mattresses at an angle close to 90 degrees. The export cable will then be covered by a second mattress to secure the cables in place and ensure that they remain protected. This crossing technique is applicable at all identified crossings.

548. Potential impacts associated with the installation of secondary cable protection (including concrete mattresses) have been fully assessed within the relevant technical chapters of the EIAR (see **Volume 3**, **Chapters 6** to **18**) and within the NIS (see response to item 16a). No new construction methods or mitigation measures are proposed beyond those already described and assessed, and no new third-party assets have been identified. As such the scope and conclusions of the existing assessments remain unchanged.

2.16.3 Item 16c

'The applicant is asked to clarify the statements in table 18-18 which states that impact to, inter-alia, gas infrastructure is scoped out of the assessment as no interactions will occur. This statement seems at odds in the context of the proposed three offshore export cables crossing an existing gas pipeline in Dublin Bay within an SAC and SPA. The applicant is requested to submit any updates or clarifications to the application documentation as required to deal with this matter in full.'

Response

549. The Applicant recognises that there is a typographical error in **Table 18-18** of EIAR **Volume 3**, **Chapter 18 Material Assets - Marine Infrastructure.** As noted by the Commission, gas pipelines within the assessment study area have been identified, and potential effects on these have been fully assessed in Section 18.10 of the chapter. The typographical error does not therefore alter the assessment or conclusions in the EIAR.

2.17 Item 17 Climate Change and Carbon

2.17.1 Item 17a

'Given the provisions of Climate Change Policy 1 within the National Marine Planning Framework, which seeks, inter-alia, to avoid, minimise or mitigate significant adverse impacts on ecosystems which provide carbon sequestration services, the applicant is asked to confirm and/or clarify whether the carbon calculations provided for in Chapter 28 (Carbon Balance Assessment) considers and/or includes potential impacts on any carbon sequestration ecosystem services offshore. In this regard commentary on land use change within paragraphs 36 and 37 of Chapter 28 seem to be focused on the onshore elements of the Proposed Development. The applicant is requested to submit additional commentary and consideration of this matter and should alterations be required to the Carbon Balance Assessment provide updates as required.'

Response

550. EIAR **Volume 3**, **Chapter 28 Climate - Carbon Balance Assessment** addresses the potential impacts of the offshore and onshore components of the Project on climate during the construction, operation and maintenance and decommissioning phases. The assessment includes a greenhouse

gas emissions (GHG) assessment which quantifies the GHG emissions from the Project over its lifetime.

551. The GHG assessment was completed referencing national guidelines, in addition to international standards and is presented as tonnes of carbon dioxide equivalent (CO2eq). These guidelines do not require consideration of seabed disturbance, and the assessment did not therefore consider the potential impacts on any carbon sequestration ecosystem services offshore.

552. However, in response to Item 17a of the FIR, changes in carbon sequestration as a result of the CWP Project have been quantified, and the impact on climate assessed. This information is presented in **Section 28.10** of the **EIAR Addendum (Part 2)**, which should be read in conjunction with **Volume 3**, **Chapter 28 Climate - Carbon Balance Assessment** of the EIAR. The updated assessment does not change the overall conclusion of the Carbon Balance Assessment.

553. In summary, a total of 12,088,840 m^2 of temporary seabed habitat disturbance at the array site and along the offshore export cable corridor is expected (as described in EIAR **Volume 3**, **Chapter 9 Fish, Shellfish and Turtle Ecology**), as well as a total of 157,000 m^2 of disturbed sediment for the landfall construction activities.

554. The tonnes of carbon dioxide equivalent (tCO_2e) released by these disturbed areas has been calculated based on the amount of organic carbon (OC) (kg/m^2) (then converted to tCO_2e, assuming 1 tonne of organic carbon is equal to 3.97 tCO_2e) presented in the 2024 report *The United Kingdom's Blue Carbon Inventory: Assessment of Marine Carbon Storage and Sequestration Potential In UK Seas (Including Within Marine Protected Areas,* which is part of *The Blue Carbon Mapping Project*, completed by the Scottish Association for Marine Science (SAMS) on behalf of World Wildlife Fund UK (WWF-UK), The Wildlife Trusts and The Royal Society for the Protection of Birds (RSPB). With this project, the UK is the first nation to map and estimate the amount of carbon stored in its seabed habitats, including within Marine Protected Areas (MPAs). A maximum organic carbon factor of 0.8 kg/m^2 has been assumed for the carbon sequestration calculation, based on Figure 2 of the aforementioned report.

555. Based on this information, the total seabed disturbance by the proposed development is predicted to result in 35,032 tCO_2e. The total GHG emissions associated with the CWP Project is therefore 17,019 tCO_2e annualised, and the total annual GHG savings (over 25-year lifespan, minus CWP Project emissions) are 1,275,891 tCO_2e. The conclusion reached in EIAR **Volume 3**, **Chapter 28 Climate - Carbon Balance Assessment** is that the CWP Project will have *direct, positive, long-term* and *significant* effect on climate, due to the GHG savings associated with the renewable energy generated by the CWP Project, is therefore unchanged.

2.18 Item 18 Offshore Cable Burial Depth

2.18.1 Item 18a

'The applicant is requested to confirm the minimum depth of cover proposed within the Dun Laoghaire Harbour Zone of Deeper Burial Depth, and provide updated drawings and sections as appropriate. In this regard the applicant should note the submission of Dun Laoghaire Rathdown County Council (DLRCC) and their recommendation that the cable lines should be buried with a minimum depth of cover of 3m. In response to this issue the applicant is requested to confirm that the 'Zone of Deeper Burial Depth' detailed on drawings sufficiently covers the area of overlap between the cable routes and the channel dredge footprint indicated within the DLRCC submission, particularly to the eastern section of the Southern Approach Channel to Dun Laoghaire Harbour. The applicant is also requested to amend the EIAR where relevant to clarify the depths to which any proposed CWP cable infrastructure will be buried in the approaches to Dun Laoghaire harbour, for example in this regard

Commitment Reference C115, Chapter 33 does not provide any detail in relation to depth of burial to be achieved. The Commission strongly encourage further liaison between the applicant and DLRCC in responding to this issue.'

Response

556. **Section 4.1** of the Applicant's **Observations Response Document** provides a full response to matters raised by Dun Laoghaire-Rathdown County Council (DLRCC). DLRCC were consulted on their observations, and a meeting took place between the CWP Project and representatives form DLRCC on 4 November 2025.

557. As noted in the **Observations Response Document**, the Applicant confirms the following:

- The depth of cover above the offshore export cables in the zone of greater burial depth will be a minimum of 3.0 m;
- There is no requirement to extend the zone of greater burial depth as, under the provisions of the Commission's Opinion of Flexibility [ABP-318588-23M], the Applicant will be able to install cables at a minimum depth of cover of 3.0m within the entirety of DLRCC's channel dredge footprint; and
- The Applicant does not intend to install secondary cable protection in the zone of greater burial depth.

558. Revision A of planning drawing **0063 Export cable burial and protection details** included with the CWP Project planning application is superseded by Revision B in the **Other Documents and Drawings** that support the Applicant's FIR response.

559. Updates have been made to the EIAR and standalone documents that describe cable burial in the zone of greater burial depth. The updates are listed below (note that the equivalent sections of the **EIAR Addendum** provide the updates).

- Sections 4.7.5 and 4.7.6 of EIAR Volume 2, Chapter 4 Project Description;
- Sections 6.9 and Section 6.10.1 of EIAR Volume 3, Chapter 6 Marine geology, sediments and coastal processes;
- Section 8.8.3 of EIAR Volume 3, Chapter 8 Subtidal and intertidal ecology;
- Sections 12.8.2 and 12.9 of EIAR Volume 3, Commercial fisheries;
- Sections 16.8.1, 16.9 and 16.10.1 of EIAR Volume 3, Chapter 16 Shipping and Navigation;
- Section 18.8.2 of EIAR Volume 3, Chapter 18 Material assets – Marine infrastructure
- Section 33.1 of EIAR Volume 5, Chapter 33 Summary of mitigation and monitoring
- Section 16.1 of EIAR Volume 4, Appendix 6.3 Navigational Risk Assessment is updated by Section 16.1 of Appendix 16-B Navigational Risk Assessment Addendum of the EIAR Addendum.
- FMMS (as updated in response to the Commission's FIR)

560. With these updates, the Applicant confirms compliance with the condition proposed by DLRCC.

2.19 Item 19 Waste and Resource Management

2.19.1 Item 19a

'It is noted that the Construction and Demolition Waste Management Plan submitted, and Chapter 31 of the EIAR relates to onshore construction activities only. In scoping out the consideration of off-shore construction, operational/maintenance and decommissioning waste, Chapter 31 of the EIAR states that offshore construction waste shall be managed on board the vessels and in line with applicable

licences and waste management legislation of the relevant base ports once confirmed. This, however, is not firmly committed to in any specific mitigation measures set out within the EIAR. The applicant is therefore requested to amend the EIAR to include this as a specific commitment within the suite of mitigation measures either as a primary design mitigation measure or as a specifically stated stand-alone mitigation measure in Chapter 31. Furthermore, the applicant is requested to commit to the provision and agreement of an offshore works Construction and Demolition Waste Management Plan incorporating the provisions of Section 5.8 (Offshore Waste Management) and 5.10 (Dropped Objects) of the Construction and Environmental Management Plan (neither of which have been referenced in Chapter 31). In the event that this request cannot be fully addressed by the applicant, the applicant is requested to provide explanation and justification for the response provided.'

Response

561. **Section 31.9** of the **EIAR Addendum (Part 2)** amends EIAR **Volume 3**, **Chapter 31 Waste and Resource Management** to incorporate a specific mitigation measure to provide an Offshore Waste Management Plan.

562. The Offshore Waste Management Plan will set out the principles for managing on-board waste streams from vessels involved in the construction, operation/maintenance and decommissioning of the CWP Project. The plan will, as requested, incorporate the relevant provisions from **Section 5.8** and **5.10** of the **Construction Environmental Management Plan** (as updated in response to the Commission's FIR).

563. Construction waste within the intertidal area will be managed in line with the **Construction and Demolition Waste Management Plan** (see Applicant's response to item 19b of the FIR).

564. The Applicant also reaffirms that any waste generated offshore will be returned to shore, offloaded and managed in line with existing the licences and waste management plans that are in place for the relevant base ports. The ports for the construction, operation/maintenance and decommissioning of the CWP Project are not yet known, however all Irish and UK ports, including Belfast, are legally required to have a waste management plan detailing how the port will manage waste reception and provide facilities for ships using the port. The operators of vessels involved in the construction, operation/maintenance and decommissioning of the CWP Project will be required to liaise with port operators to facilitate appropriate storage, transfer, segregation and disposal of waste generated offshore.

2.19.2 Item 19b

'Further to item 19(a) above, the applicant is requested to provide further details in relation to the proposed management of construction and demolition waste within the intertidal area construction zone as Chapter 31 of the EIAR does not consider/review works below and beyond the high water mark. Whether open cut trenching (OCT) using a floating pontoon as originally proposed or Horizontal Directional Drilling (HDD) (which the Commission have asked to be considered as a potential construction methodology within this further information request) are used, the application documentation presents uncertainty in relation to construction and waste management in the intertidal area. The Commission therefore queries how waste and resource management will be handled and regulated in the intertidal zone. In this regard, the applicant is requested to review and update Chapter 31 in relation to the management and mitigation of waste arisings (if any) within the intertidal zone, and provide details of any further mitigation measures which may be appropriate having regard to the designated nature of this location as both an SAC and SPA. Any additional mitigation or assessment requirements should also be accommodated within the other relevant sections of the EIAR and NIS as appropriate.'

Response

565. Excavated material generated during the excavation of trenches and cable burial works in the intertidal area will be stored at the work areas and backfilled. This material will not require removal off-site and was therefore not included in the estimated volume of soil and aggregate waste requiring removal off-site, as assessed in **Section 31.10.1** of EIAR **Volume 3**, **Chapter 31 Waste and Resource Management**.

566. Low volumes of other waste are predicted to be generated from works within the intertidal zone.

567. The waste streams within the intertidal zone will vary and may include non-hazardous streams such as off-cuts, packaging, surplus or damaged materials from the construction activities. Hazardous streams may include sealants and chemicals.

568. All wastes will be stored in secure, designated containers on either the equipment storage barge or tensioner platform. Additionally, any hazardous wastes will be stored in bunded containers. All waste arisings will be removed from the intertidal area by construction personnel on return to Compound A during low tide cycles. Once the waste arisings are brought to Compound A, the waste streams will be placed into dedicated containers, prior to transportation off-site to an appropriately permitted or licensed waste facility.

569. The waste arisings will be managed in accordance with the **Construction Demolition and Waste Management Plan** (**CDWMP**) which was submitted with the planning application, and is detailed in **Section 31.10.1** of **Volume 3, Chapter 31 Waste and Resource Management** of the EIAR. Section 6 of the **CDWMP** has been updated to specifically incorporate details of on the management of construction waste within the intertidal zone, and is submitted as part of the Applicant's FIR response.

570. With the adoption of the measures in the updated **CDWMP**, no further mitigation measures are required to manage waste streams from the intertidal area.

2.20 Item 20 Seascape, Landscape and Visual Impact Assessment

2.20.1 Items 20a

'The applicant is requested to submit an additional series of maps in support of Chapter 15 (Seascape, Landscape and Visual Impact Assessment) of the EIAR which colour codes the level of potential residual effects listed in tables 15-23, 15-24, 15-25, 15-26, 15-27, 15-28, and 15-29, across all identified receptors predicted to arise from the operations and maintenance impact 1 (Direct/Indirect long-term though reversible impacts on seascape, landscape/townscape, national designated landscapes and visual receptors) of the proposed development. The Commission is of the opinion that the discussion and assessment of seascape, landscape and visual impact assessment would greatly benefit from additional clarity being provided in the mapping to visually identify the residual impacts predicted at each of the receptors. Furthermore, the Commission notes that some receptors (such as sequential routes) are subdivided for discussion purposes and assignment of significance of impact within the text, however, such subdivisions are not identified in any associated mapping. In the interests of clarity any revised mapping should clearly identify such subdivisions and show through colour-coding all the predicted levels of residual effect from the tables (i.e. Imperceptible, Not Significant, Slight-Not Significant, Slight, Moderate-Slight, Moderate, Significant, Very Significant). In relation to this requested mapping the Commission acknowledges that recreational marine users (Visual receptor Group 9) residual effects cannot be accurately mapped outside established navigational lanes and ports.'

Response

571. As requested, the Applicant has prepared an additional series of maps in support of **Volume 3, Chapter 15 Seascape, Landscape and Visual Impact Assessment** of the EIAR which colour codes the level of potential residual effects listed in tables 15-23, 15-24, 15-25, 15-26, 15-27, and 15-28, predicted to arise from the operations and maintenance impact 1 (Direct/Indirect long-term though reversible impacts on seascape, landscape/townscape, national designated landscapes and visual receptors) of the CWP Project. These Figures are available in **Appendix O – SLVIA additional maps** of this **FIR Response Document**.

572. These Figures have been prepared to support the response to the Commission's FIR and complement the existing presentation. The figures do not change the Seascape, Landscape and Visual Impact Assessment (SLVIA) assessment within the submitted EIAR, and should be read in conjunction with **Volume 3, Chapter 15 Seascape, Landscape and Visual Impact Assessment, Section 15.10.2.**

573. The assessment of Visual Receptors Groups (VRGs) was drawn from receptors grouped within approximate geographic areas (based on the settlement hierarchy and areas with broadly similar characteristics and predicted visibility). The Applicant has therefore not presented a figure showing the extent of the VRGs. The mapping of the extent of such groups would be very approximate; with boundaries between VRGs becoming blurred leading to confusion and misinterpretation.

2.20.2 Item 20b

'Section 23.14 of the EIAR states that no monitoring is required in relation to the Landscape and Visual Impact Assessment and therefore no monitoring is outlined in the submitted In Principle Project Environmental Monitoring Plan. The applicant is advised that the Commission considers the successful establishment and growth of the mitigatory planting referenced within the relevant primary mitigation measures set out in Section 23 of the EIAR (Table 23-11 refers) to be of significant importance (considering the established recreational amenities in the vicinity and the general amenity of the area) and to merit confirmation of successful implementation. Accordingly the applicant is requested to provide a suitable programme of monitoring, and any additional further adaptive measures to ensure the success of the relevant mitigatory planting/landscaping proposals as part of an updated IPEMP.'

Response

574. Monitoring measures for the landscaping proposals at the onshore development area have been developed, and are presented in **Section 23.14** of the **EIAR Addendum (Part 2)** and in the updated **CEMP.**

575. In summary, prior to the commencement of construction activities for the onshore transmission infrastructure, a Plan detailing maintenance, management, plant replacement and monitoring details will be provided to Dublin City Council for approval. The planting works will be monitored by the Ecological/Environmental Clerk of Works during the construction phase.

576. During the following three-year establishment period, a suitably qualified person (landscape clerk of works or landscape architect) and a maintenance contractor will be appointed by the Applicant. They will undertake monitoring and maintenance works which will include for the replacement of any diseased, dying or missing plants during the first available growing season.

The **IPPEMP** submitted with the CWP Project planning application does not concern environmental mitigation and monitoring relating to the onshore components of the CWP Project. These are described in the **CEMP** (and as updated in response to the FIR). The **IPPEMP** has therefore not been updated in relation to this request.

2.21 Item 21 Noise

2.21.1 Item 21a

'Appendix 24.3 – 'Operational Phase Offshore Wind Farm Turbine Noise' states that the sound power level data for the option A and option B layouts have been 'provided by CWP'. No further detail has been provided in relation to the source of this data, it's applicability to the proposed development, nor any commitment to the proposed installed technology adhering/committing to this sound power level. The applicant is requested to submit further information clarifying the source of this sound power level data and provide justification and/or commitment as to its applicability/suitability in the context of the current proposed development and the turbine (or range of turbine) technology proposed to be deployed.'

Response

577. **Volume 4, Appendix 24.3 Operational Phase Offshore Wind Farm Turbine Noise** of the EIAR sets out the noise emission data used for the two WTG options included in the CWP Project planning application. The maximum octave band sound power noise emissions for Option A and Option B are presented in Table 2 and Table 4 respectively.

578. The source of the WTG noise data used to undertake the operational noise assessment is commercially sensitive and has been shared under confidentiality agreements. The data has been supplied by leading WTG Original Equipment Manufacturers (OEMs) and is representative of the highest sound power levels expected for the WTGs under consideration for the CWP Project. The level of detail provided in **Appendix 24.3** ensures transparency in how operational noise from WTGs is calculated.

579. Notwithstanding the Applicant's confidence in the accuracy of this data, the conservative nature of the assessment is also noted. **Section 24.9.3** (paragraph 293) of **Volume 3, Chapter 24 Noise and Vibration** of the EIAR confirms that an allowance for uncertainty in the measurement of WTG source levels of +2 dB is applied in modelling to all WTG sound power levels. Additionally, **Appendix 24.1** (paragraph 50) of the EIAR confirms that, "*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*".

2.21.2 Item 21b

'The applicant is requested to amend Chapters 24 and 33 of the EIAR to include the commitments detailed in paragraphs 53, 54, and 55 of Appendix 24.1 as mitigation measures should the need to develop additional specific noise characteristic curtailment strategies arise.'

Response

580. **Section 22** of the **CEA Report (Part 3)** confirms that predicted noise levels from operational WTGs from the CWP Project alone, and cumulatively with other proposed OWFs (Dublin Array and Arklow Bank Phase 2) at the nearest Noise Sensitive Location (NSL) are below the 35 dB LA90 threshold. The CEA confirms that the assessment is conservative as it assumes all receptors are downwind of all WTGs 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.

581. As the predicted noise levels are below the 35 dB LA90 threshold, no mitigation is required. Regardless, the information presented in paragraphs 53, 54 and 55 of **Appendix 24.1** of the EIAR does not constitute mitigation that would be implemented to address the effects of noise levels, but rather a commitment by the Applicant to investigate noise related non-compliance in the unlikely event that it should arise.

582. This commitment by the Applicant aligns with current industry best practices, and is described in the updated **CEMP**.

2.21.3 Item 21c

'The Commission notes that paragraph 437 of Chapter 24 of the EIAR states that no monitoring is required in relation to noise and vibration arising from the proposed development. In the absence of monitoring the applicant is requested to provide comprehensive details of how it is intended to assure all relevant stakeholders that the noise emission levels committed to and/or set out within the EIAR for construction, operational and maintenance, as well as decommissioning phases will not be exceeded. Should monitoring be proposed as the most effective means of ensuring application of the relevant noise emission levels the applicant is invited to include their proposals in this regard in an updated In Principle Project Environmental Monitoring Plan.'

Response

583. **Section 24.10** of **Volume 3**, **Chapter 24 Noise and Vibration** details the noise and vibration monitoring proposed during the construction phase of the CWP Project. This commitment to monitoring is also reflected in the **CEMP** and in EIAR **Volume 5**, **Chapter 33 Summary of Mitigation and Monitoring**.

584. The Applicant also confirms that these commitments apply to both the construction and decommissioning phases, and this is confirmed in EIAR **Volume 5**, **Chapter 33 Summary of Mitigation and Monitoring**.

585. The **IPPEMP** submitted with the CWP Project planning application concerns monitoring associated with the offshore components of the CWP Project, and certain onshore operational phase monitoring commitments. Environmental mitigation and monitoring relating to the onshore components of the CWP Project during the construction phase, including the abovementioned noise and vibration commitments, are secured by the **CEMP**. The **IPPEMP** has therefore not been updated in relation to this request.

586. **Section 24.10.2** of **Volume 3, Chapter 24 Noise and Vibration** details the noise mitigation relevant to the operational phase of the CWP Project.

587. **Section 24.9.4** of **Volume 3, Chapter 24 Noise and Vibration** describes that a 3D computer based model was prepared to quantify the noise levels associated with the onshore substation at residential NSLs. The modelling indicated that noise levels were within the relevant adopted criteria for all NSLs during the daytime and nighttime. This model also incorporated a +6dB correction, which was considered a conservative figure in the absence of octave band data.

588. The assessment concluded that there is a low impact from the onshore substation and this was reflected in the noise rating level at the NSLs not exceeding the background sound level.Taking account of the low impact and that the significance of the residual effect is Imperceptible, it is not necessary to undertake noise monitoring of the onshore substation during the operational and maintenance phase.

589. In regards to airborne noise generated by the operational WTGs, as highlighted above, predicted noise levels are below the 35 dB LA90 threshold and therefore no mitigation or monitoring is required. A commitment by the Applicant to investigate noise related non-compliance has been added to the updated **CEMP** in the unlikely event that it should arise.

2.22 Item 22 Onshore Substation Access Arrangements

2.22.1 Item 22a

'Chapter 4, paragraph 405 references the provision of a temporary bailey bridge to facilitate construction access to the on-shore substation site pending the provision of the permanent bridge. While the overall approach is acknowledged by the Commission, no details have been provided in relation to the nature, extent, construction or installation details of the bailey bridge, the duration over which it will be in place, its ability to cater for the relevant construction traffic, and at what stage the permanent bridge will be required to be installed to facilitate the construction and operational process. Furthermore, the application documentation does not appear to include comprehensive details in relation to the intended treatment of the 7m wide temporary link road into the substation site off the Pigeon House Road following the construction phase. The applicant is requested to submit comprehensive details in this regard, as well as confirming that all relevant impacts arising from the temporary installation and removal of the bailey bridge have been incorporated into the overall environmental assessments throughout the EIAR.'

Response

Bailey bridge

590. As detailed in **Section 4.9.3** of EIAR **Volume 2**, **Chapter 4 Project Description**, the bridge to the west of the onshore substation site is proposed as part of the permanent access solution for the onshore substation and the objective is to construct it early on in the construction programme. **Chapter 4 Project Description** and **Planning Drawings 0031** and **0032** detail how the permanent access bridge will be formed.

591. In the event that a temporary bailey bridge is required in advance of the permanent access bridge, the installation would require new piled foundations and concrete bank seats on the eastern and western side of the cooling water channel. These piled foundations and bank seats are detailed in **Appendix P – Temporary bailey bridge drawings** of this **FIR Response Document**. These works would be used for the installation of the permanent bridge.

592. The temporary bailey bridge, if required, will be c. 4.2 m in width and 24 m in length and will be transported to site in modular steel sections. Once the foundations and bank seats are constructed, the modular sections will be slid or crane lifted into place. The bridge will be designed to account for construction traffic types and volumes described in EIAR **Volume 3, Appendix 27.1 Traffic and Transport Assessment**. Temporary vehicle restraints will also be installed. Surface runoff will be into the River Liffey (as would naturally occur).

593. The temporary bailey bridge would be removed and replaced with the permanent access bridge prior to the installation of the heavy transformers within the onshore substation buildings. The permanent access bridge is required to be in place to facilitate the delivery of the heavy transformers to site.

594. The bailey bridge impacts are associated with the construction of the piled foundations and bank seat on each side of the cooling water channel. These details have been described in **Chapter 4 Project Description** and accounted for in the environmental assessments throughout the EIAR.

Temporary link road

595. The 7m wide temporary link road detailed on Planning Drawing 0055 of the CWP Project planning application will be installed to provide access from the Pigeon House Road to the onshore substation site and Compound C during the construction phase. The construction phase effects have been considered in EIAR **Volume 3, Chapters 19 – 32** as appropriate.

596. Once the construction phase is completed, the access will be closed by the Project on both sides, with the road infrastructure left in place for use as required by the landowner.

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Appendix A - List of prescribed and transboundary bodies


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Name of Organisation	Response received? (Y/N)
Coastal Planning Authorities	
Wicklow County Council	N
Dún Laoghaire–Rathdown County Council	Y
Dublin City Council	Y
Prescribed Bodies	
Department of Foreign Affairs	N
Minister for Housing, Local Government and Heritage	Y
Minister for the Environment, Climate and Communications	N
Minister for Transport	N
Minister for Defence	N
Minister for Agriculture, Food and the Marine	Y
Environmental Protection Agency	N
Maritime Area Regulatory Authority	Y
Minister for Rural and Community Development	N
Marine Institute	Y
Inland Fisheries Ireland	N
Health and Safety Authority	Y
Commission for Regulation of Utilities	N
Fáilte Ireland	Y
An Taisce	Y
Eastern & Midland Regional Assembly	N
National Transport Authority	N
Irish Aviation Authority	Y
Sustainable Energy Authority of Ireland	N
Eirgrid	N
Commissioner of Irish Lights	Y
Irish Coastguard	N
Loughs Agency	Y
Fingal County Council	N
Transboundary bodies	
Department for Infrastructure (Northern Ireland)	Y
Department of Infrastructure (Isle of Man)	Y (via Department of Environment, Food and Agriculture (incl. Isle of Man Territorial Sea Committee))
Welsh Government's Energy Policy Team (Wales)	N

Planning and Environment Decisions Wales (Wales)	N
Department of Housing, Communities and Local Government (England)	N
Marine Directorate (Scotland)	Y (via NatureScot)



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Appendix B - Schedule of post application consultations


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1 Introduction

1. This schedule provides an overview of the post-application consultation undertaken for the purposes of responding to the Further Information Request (FIR) from An Coimisiún Pleanála (hereafter referred to as 'the Commission').

2 Consultation with the Commission

2. The Applicant met with the Commission on 5 November 2025 under Article 5(6) of the Planning and Development (Maritime Development) Regulations, 2023. The purpose of the meeting was to discuss any clarifications that the Applicant sought on the Commission's FIR.

3 Consultation with prescribed bodies and other stakeholders

3. The following tables provide a summary of post application consultations with prescribed bodies and other stakeholders.

Table 1 Commercial fisheries engagement

Commercial Fisheries		
Prescribed Body / Stakeholder / Group	**Date of meeting**	**Details**
Fishers	Ongoing	The Fisheries Liaison Officer (FLO) remains in in post, providing continuity and facilitation for ongoing consultation and engagement with the fishing industry, including regular quay side meetings and discussing updates in relation to the project and ongoing whelk monitoring.
Phase 1 Projects	Ongoing	The Applicant has met regularly with the other Phase 1 Projects to agree a collaborative approach to addressing concerns relating to cumulative displacement and is committed to continuing these constructive and proactive discussions.
Seafood/Offshore Renewable Energy (ORE) Working Group	Ongoing	The Applicant is an active member of the Seafood/ORE Working Group. Subgroups have been developed to discuss approaches to positive engagement, ways to maximise the potential for coexistence and addressing potential cumulative displacement all of which the Applicant is fully engaged in.
Marine Institute	November 2025	The Applicant, together with other Phase 1 Projects, has met with the Marine Institute to discuss approaches to alleviating cumulative displacement concerns.

Table 2 Shipping and Navigation engagement

Prescribed Body / Stakeholder / Group	Date of Meeting	Details
Post Submission Consultation		
Irish Coastguard (IRCG)	9 October 2025 (In person)	The Applicant met with IRCG to discuss the points raised in their observations and the Commission's FIR. It was noted that Search and Rescue (SAR) lanes of a minimum of 500 m are maintained in one line of orientation (East / West) through the CWP Project array. SAR lanes are maintained in a second line of orientation (North / South) apart from in one lane where an OSS is located. The Applicant noted that the layout is therefore strictly a Single Line of Orientation (SLoO) layout, however the majority of the layout accommodates multiple lines of orientation. It was decided that in line with the Department of Transport (DoT) Guidance on Safety of Navigation & Emergency Response: Offshore Renewable Energy Installations (DoT, 2025a), IRCG requires SLoO layouts to be supported by a Safety Justification. It was agreed the safety justification will provide mitigating measures in relation to a SLoO when searching for a casualty within the wind farm for Layout Option A (75 WTG's) & Option B (60 WTG's). It was agreed that another in person meeting was appropriate prior to submission of a Safety Justification.
Marine Survey Office (MSO)	23 October 2025 (In person)	The Applicant met the MSO to review and discuss their observations. They stated that they were generally content with the CWP Project from a surface navigation perspective given its location being setback from inshore traffic as a result of the India and Codling Banks. The MSO queried whether the Applicant was liaising with the Dublin Array project given proximity. This includes cable crossings. The Applicant confirmed it regularly engages with Dublin Array, and the engagement includes cable crossing discussions and associated crossing agreements. The MSO recommended that validation traffic exercises should be undertaken pre and post construction and the Navigation Risk Assessment (NRA) should be updated accordingly. The Applicant confirmed acceptance of this request (see **Chapter 16 Shipping and Navigation** of the **EIAR Addendum).** The MSO stated that project support vessels, where appropriate shall satisfy domestic load line certification requirements and smaller support vessels deployed shall be appropriately licensed for relevant operations. The Applicant confirmed that all project vessels will satisfy Irish load line requirements and will be appropriately licensed.
Commissioner of Irish Lights (CIL)	29 October 2025	The Applicant met with CIL to review and discuss their observations. The Applicant also provided an overview of the navigational features in the area.

		CIL stated they were content with the application and were content with the Lighting and Marking Plan as submitted. It was agreed that it will be a live document and will be finalised post-consent once the final layout has been selected. This final version will require agreement from CIL and the Irish Aviation Authority (IAA). CIL noted that the Export Cable Corridor (ECC) passes in proximity to the designated anchorage area in Dublin Bay but did not expect it to be an issue from CIL's perspective. CIL noted that a full instruction will be provided to the CWP Project on the use of CIL's online reporting portal in relation to Aids to Navigation (AtoN).
IRCG	26 November 2025 (In person)	The Applicant presented the draft Safety Justification to IRCG. Following suggested edits, it was agreed that The Applicant can submit the Safety justification. The Safety Justification was submitted to the IRCG on 2 December 2025 and is provided in **Appendix 16-A IRCG Safety Justification** of the **EIAR Addendum**.
IRCG	11 February 2026 (Email)	Following review, the IRCG confirmed via a letter on 11 February 2026 that they were content that the relevant requirements had been met, subject to implementation of conditions set out in the letter. The Applicant notes the conditions and have no comments on them. This letter is provided in **Appendix D – Letter from IRCG r.e. Safety Justification** of the **FIR Response Document**.

Table 3 Marine Archaeology engagement

Prescribed Body / Stakeholder / Group	Date of Meeting	Details
Post Submission Consultation		
National Monuments Service (NMS)	20 October 2025	Following comments issued from the DAU in their observation, the Applicant engaged with the NMS to clarify any outstanding requirements and to discuss observations in relation to underwater archaeology. During this consultation the NMS noted the requirement for a Marine Archaeology Management Plan (MAMP). It was noted that all applicable archaeological mitigation strategies are to presented in the draft MAMP. The main discussion points included: • Implementation of AEZs and infrastructure constraints around seabed features of archaeological potential • Onboard archaeological monitoring; • The draft MAMP will be finalised post-consent/pre-construction; • Pre-construction surveys.
NMS	15 January 2026	The Applicant issued a draft MAMP to the NMS for review and comment.

NMS	23 January 2026	The Applicant held an online meeting with the NMS to review the draft MAMP, and edits were agreed.
NMS	25 February 2026	Following issue of the updated MAMP to the NMS, they confirmed their acceptance of the MAMP via an email. The draft MAMP is included in the Applicant's FIR Response (**Marine Archaeology Management Plan**), and NMS's acceptance of the draft MAMP is provided in **Appendix M – NMS approval of draft Marine Archaeology Management Plan (MAMP)** of the **FIR Response Document**.

Table 4 Aviation engagement

Prescribed Body / Stakeholder / Group	Date of Meeting	Details
Post Submission Consultation		
Air Nav Ireland	21 October 2025	The Applicant held an online meeting with AirNav Ireland to discuss Irish Aviation Authority's (IAA) observations and confirm any potential impacts on instrument flight procedures and communication, navigation and surveillance equipment at Dublin Airport.
Air Nav Ireland and DAA	23 October 2025	AirNav Ireland confirmed in a letter dated 23 October 2025 that they have no concerns regarding potential impact on instrument flight procedures, obstacle limitation surfaces or communication, navigation and surveillance facilities at Dublin Airport. This letter is available in **Appendix N – Letter from AirNav Ireland r.e. Dublin Airport** of the **FIR Response Document.**

Table 5 Ornithology engagement

Prescribed Body / Stakeholder / Group	Date of Meeting	Details
Post Submission Consultation		
NPWS	27 November 2025	The Applicant held an online meeting with the National Parks and Wildlife Service (NPWS) to discuss and seek clarification on key comments made in their observation response to the planning application. The Applicant noted that additional baseline validation data had been collected from five primary sources – updated Digital Aerial Surveys (DAS), boat-based (visual and acoustic) surveys, vantage point surveys, landfall surveys, and recent publications. Based on the data analysed to date, the surveys confirm the assumptions within the baseline characterisation. The Applicant noted that NPWS's observation made reference to radar surveys for migratory birds. It was considered that this method of data collection, although potentially a valuable tool for monitoring exercises, would not materially change the

		characterisation of the receiving environment for the purposes of EIAR. The Applicant noted that recent surveys identified a continued theme across existing and recent characterisation datasets. Clarification was sought on construction and operation phase monitoring. CWP noted that monitoring would take an evidence 'key question' led approach. NPWS noted certain questions such as collision and avoidance could be considered as part of future more detailed discussions about monitoring, which the Applicant agreed with. The Applicant noted that the requested parameters for the assessment of potential impacts to kittiwake at Wicklow Head SPA, as provided within the observation, would be utilised. The Applicant further confirmed acceptance of the request to extend the over winter seasonal restriction on intertidal working to mid-April.

Table 6 Marine Mammals engagement

Prescribed Body / Stakeholder / Group	Date of Meeting	Details
Post Submission Consultation		
NPWS	27 November 2025	The Applicant held an online meeting with the NPWS to discuss and seek clarification on key comments made in their observation response to the planning application. The Applicant noted that additional validation data had been collected from four primary sources – updated Digital Aerial Surveys (DAS), boat-based surveys, landfall surveys for seals, and recent publications. **Extension of DAS to include a 10km buffer** In relation to the request for extension of DAS to a 10 km buffer, additional surveys have been conducted since May 2025 covering the array area +10 km buffer to validate the EIAR baseline (see **Appendix 11-A Update to Marine Mammal Baseline Characterisation** of the **EIAR Addendum)**. The Applicant noted that the surveys completed up to the date of the meeting so far confirmed the assumptions within the baseline characterisation in the EIAR. The Applicant noted that the existing characterisation was considered robust and appropriate for the purposes of EIAR and further validated these to complete a composite dataset. NPWS noted the additional data to be positive and useful.
		Request for seal landfall surveys to validate baseline NPWS highlighted that new Irish haul-out surveys have been published on the NPWS website (Morris et al., 2025) and should

		be included in the baseline (these surveys have been considered in the EIAR Addendum and NIS Addendum). The Applicant confirmed that dedicated seal landfall surveys are being conducted from January 2025 to January 2026. The composite data set of the older anecdotal sightings and the more recent dedicated seal surveys have confirmed low numbers of seals in the area. Additionally, the Applicant noted seal haul out sites in Dublin Bay and wider area have been recorded by *Berrow et al.* (2024). The number and distribution of seals in these surveys were consistent with previous surveys by *Morris and Duck (2019*). This confirms that the MU abundance estimate used in the EIAR quantitative assessment remains valid. (see **Appendix 11-B** of the **EIAR Addendum.**
		Addition of baseline PAM The Applicant noted that the NPWS observation made reference to Passive Acoustic Monitoring (PAM). The Applicant noted that this method of data collection, although valuable for impact monitoring exercises at a strategic scale would not materially change the characterisation for the purposes of EIAR. It was further noted that the existing characterisation was considered robust and appropriate for the purposes of EIAR, and the additional data collected to date validated these to complete a composite dataset. NPWS noted the additional data to be positive and useful.
		Assessment of TTS CWP provided a summary of a position paper on Temporary Threshold Shift (TTS) in marine mammals, drafted by the Sea Mammal Research Unit and peer reviewed by Brandon Southall who authored the TTS/Permanent Threshold Shift (PTS) thresholds guidance. His research team agrees that the TTS-ONSET threshold shouldn't be used to assess injury. The Applicant noted an intention to submit the position paper with the FIR response. NPWS noted they would consider it. The position paper is provided in **Appendix 11-B SMRU Position Paper on TTS** of the **EIAR Addendum**.
		Inclusion of noise abatement To mitigate potential impacts from underwater noise during the construction of the project, the Applicant noted that it is considering appropriate mitigation, which will include consideration of noise abatement. The Applicant further confirmed that an updated assessment would consider mitigated noise levels for piling. NPWS noted the Applicant's commitment to noise reduction

		Compliance with DAHG (2014) guidance The Applicant has amended the MMMP (**updated MMMP**) to comply with DAHG (2014) guidance (or any such updated guidance issued in the interim). NPWS highlighted that new UWN guidance is not yet available, but that it will likely be in line with the GOMOREUS report (Tougaard et al., 2025).
		Additional information on monitoring The Applicant confirmed monitoring measures have been provided in the In Principle Project Environmental Monitoring Plan (IPPEMP) submitted in support of the planning application but would welcome any additional suggestions. Potential monitoring options for marine mammals were noted by the Applicant, including strategic monitoring within the East Coast Monitoring Group. NPWS confirmed they support detailed discussions on monitoring at a strategic and project level in the future.

Table 7 Offshore Bats engagement

Prescribed Body / Stakeholder / Group	Date of Meeting	Details
Post Submission Consultation		
NPWS	27 November 2025	At the above mentioned meeting with NPWS, the Applicant highlighted the key areas for which clarification and/or updates were being provided. For bat ecology these were: more recent data, as requested, including at sea data collection from ships and perceived data gaps, and assessment of data in terms of likely significant impacts on bat species. The Applicant noted that additional validation data had been collected from three primary sources – updated headland surveys in Ireland and Wales, boat-based surveys in the proposed array area, and recent publications. Following clarifications on aspects of the methodology NPWS noted the additional data to be useful, with two full years of data being positive. The Applicant noted that the additional data remain consistent with and validates the data presented in the EIAR, and would take an evidence lead approach to mitigation. The Applicant confirmed monitoring measures to have been provided in the In Principle Project Environmental Monitoring Plan (IPPEMP) but would welcome any additional suggestions. NPWS confirmed that discussion in the future on monitoring would be appropriate.

Table 8 Other Engagement

Prescribed Body / Stakeholder / Group	Date of Meeting	Details
Post Submission Consultation		
Dún Laoghaire-Rathdown County Council (DLRCC)	4 November 2025	The Applicant met with DLRCC to review and discuss their observations regarding cable burial in the zone of greater burial depth to the east of Dún Laoghaire harbour. The Applicant confirmed that the CWP Project will be able to comply with the condition proposed in DLRCC's observation '*In the interest of safeguarding future operations at Dun Laoghaire Harbour*.' Further information on cable burial compliance is available in **Section 4.1** of the **Observations Response Document** accompanying the Applicant's response to the FIR.

4 References

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6. Morris, C., and C. Duck. (2019). Aerial thermal-imaging survey of seals in Ireland 2017 to 2018. National Parks and Wildlife Service. Department of Culture, Heritage and the Gaeltacht, 2019-10, Irish wildlife manuals, No.111, 2019.

7. Tougaard, J., M. Mikaelsen, and E. Griffiths. (2025). GOMOREUS – Guidance on Managing Offshore Renewable Energy Underwater Sound. Modelling of impact ranges for pile driving in Irish waters.



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Appendix C - Data validation statements


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Abbreviations

Abbreviation	Term in Full
ABP	An Bord Pleanála
ACP	An Coimisiún Pleanála
CCRA	climate change risk assessment
CDWMP	Construction and Demolition Waste Management Plan
DAS	Digital Aerial Surveys
eDNA	Environmental Deoxyribonucleic acid
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EPA	Environmental Protection Agency
ESAS	European seabirds at sea
FIR	Further Information Request
LVIA	Landscape and Visual Impact Assessment
MAMP	Marine Archaeological Management Plan
NSLs	Noise Sensitive Locations
OECC	Offshore Export Cable Corridor
SAC	Special Area of Conservation
WFD	Water Framework Directive
UAU	Underwater Archaeological Unit

1 Introduction

1. On Friday 6th September 2024 Codling Wind Park Ltd (referred hereafter as the 'Applicant') applied for planning permission to An Bord Pleanála (now An Coimisiún Pleanála (and referred to hereafter as the Commission)) under Section 291 of the Planning and Development Act 2000, as amended, for the construction, operation and maintenance and decommissioning of the CWP Project. On 1st August 2025, having reviewed the application documentation, including the EIAR, the Commission issued a Further Information Request (FIR) in relation to the CWP Project.

2. This Appendix has been developed in response to FIR Item 1(b) which states:

> *'The scientific information provided as part of the planning application documentation should be based on up-to-date survey reports and data. Accordingly, the applicant is requested to confirm/provide justification/verification that the information submitted in support of the planning application remains relevant and appropriate at the point of submitting further information or to update same as required.'*

3. The Applicant confirms that the scientific information provided as part of the planning application and their response to the Commission's FIR is based on up-to-date survey reports and data. The information submitted in support of the planning application therefore remains relevant and appropriate at the point of submitting further information.

4. Validation statements for each Environmental Impact Assessment Report (EIAR) topic are provided in **Table 1-A**.

2 Data validation statements

Table 1-A Data validation statements

Topic	Statement
Chapter 6 Marine Geology, Sediments and Coastal Processes	**Section 6.6** of EIAR **Volume 3**, **Chapter 6 Marine Geology, Sediments and Coastal Processes** describes the study area baseline conditions with respect to bathymetry, physical oceanographic regime, solid geology, surficial and sub surface sediments, sediment transport, and coastal processes and morphology. The description of the baseline environment is informed by a wide variety of data sources, including both regional and site-specific data, which includes updates to sediment transport modelling (see **Appendix 6-A Modelling Report Addendum** and **Appendix 6-B Intertidal Assessment** of the EIAR) which have considered sediment data acquired during 2025 as part of the characterisation validation surveys reported here and throughout the EIAR Addenda. The baseline and modelling approach are designed to represent long-term system behaviour, not transient conditions. The interval since the data was collected and analysed for the purposes of the EIA is considered negligible in the context of the timescales needed for meaningful change; this is evidenced through the consideration of recent sediment data. It can therefore be concluded with confidence that the scientific information submitted in support of the planning application remains relevant and appropriate for drawing robust conclusions.
Chapter 7 Marine Water Quality	**Section 7.6** of EIAR **Volume 3**, **Chapter 7 Marine Water Quality** describes the study area baseline conditions with respect to marine water quality. The description of the baseline environment is informed by a wide variety of data

Topic	Statement
	sources, including data and information for the relevant Water Framework Directive (WFD) transitional and coastal waterbodies. An update to EIAR **Volume 3**, **Chapter 7 Marine Water Quality** has been made to include contemporary WFD data and information that has become available since the CWP Project planning application was submitted. This information makes the WFD baseline described in the EIAR contemporary, and is provided in **Section 7.6** of the **EIAR Addendum** (including **Appendix 7-A Water Framework Directive Addendum**). Site specific survey data including the contaminant analysis results from the 2025 benthic and intertidal site-specific surveys undertaken in response to the Commission's FIR validates the existing characterisation, and is complimented by contemporary information from the Water Quality in Ireland 2019-2024 report (EPA, 2025). This combination of site specific validation data and contemporary regional data supports and validates the existing data and information in EIAR **Volume 3**, **Chapter 7 Marine Water Quality**. In summary, it can be concluded with confidence that the scientific information submitted in support of the planning application, including the **EIAR Addendum**, is relevant and appropriate for drawing robust conclusions.
Chapter 8 Subtidal and Intertidal Ecology	**Section 8.6** of EIAR **Volume 3**, **Chapter 8 Subtidal and Intertidal Ecology** describes the study area baseline conditions with respect to subtidal and intertidal ecology. The description of the baseline environment is informed by a wide variety of data sources. An update to **Section 8.6** of EIAR **Volume 3**, **Chapter 8 Subtidal and Intertidal Ecology** has been made to summarise data obtained from additional surveys undertaken in 2025 in response to items 8a, 8b and 8c of the Commission's FIR. The additional data, summarised in **Section 8.6** of the **EIAR Addendum**, validates and supports the existing baseline characterisation for subtidal and intertidal ecology presented in **Section 8.6** of EIAR **Volume 3**, **Chapter 8 Subtidal and Intertidal Ecology**. Analysis of this data has demonstrated no material change to the current baseline for all relevant receptors. Detailed results of the abovementioned surveys are presented in **Appendix 8-A Benthic Subtidal Survey Report 2025** and **Appendix 8-B Landfall and Intertidal Survey Report 2025** of the **EIAR Addendum**. In addition to the above and in response to item 8d of the Commission's FIR, the Applicant commissioned a survey to provide additional scientific data on the habitats present within the Wicklow Reef SAC. This information, summarised in **Section 8.6** of the **EIAR Addendum** and presented in full in **Appendix 8-C DDV Wicklow Reef Survey Report 2025** of the **EIAR Addendum**, adds to the baseline described in the EIAR. In summary, it can be concluded with confidence that the scientific information submitted in support of the planning application, including the **EIAR Addendum**, is relevant and appropriate for drawing robust conclusions.
Chapter 9 Fish, Shellfish, and Turtles Ecology	**Section 9.6** of EIAR **Volume 3**, **Chapter 9 Fish, Shellfish, and Turtles Ecology** describes the study area baseline conditions with respect to fish, shellfish, and turtles' ecology. The description of the baseline environment is informed by a wide variety of data sources. An update to **Section 9.6** of EIAR **Volume 3**, **Chapter 9 Fish, Shellfish, and Turtles Ecology** has been made in response to item 11a of the Commission's FIR to account for a new regional study area. As part of this update the Applicant has summarised additional data obtained from environmental deoxyribonucleic

Topic	Statement
	acid (eDNA) surveys undertaken in 2025. The additional data, summarised in **Section 9.6** of the **EIAR Addendum**, validates and supports the existing baseline characterisation fish, shellfish, and turtles' ecology presented in **Section 9.6** of EIAR **Volume 3**, **Chapter 9 Fish, Shellfish, and Turtles Ecology**. Detailed results of the eDNA surveys are presented in **Appendix 9-A CWP Migratory Fish eDNA Survey Report 2025** of the EIAR Addendum. Other relevant updates to desk based data sources, Marine Institute 2024 data on spawning and nursery grounds, have also been incorporated into **Section 9.6** of the **EIAR Addendum**. In summary, it can be concluded with confidence that the scientific information submitted in support of the planning application, including the **EIAR Addendum**, is relevant and appropriate for drawing robust conclusions.
Chapter 10 Ornithology	**Section 10.6** of EIAR **Volume 3**, **Chapter 10 Ornithology** describes the baseline conditions with respect to ornithological receptors within the offshore and onshore development areas. The description of the baseline environment is informed by a wide variety of data sources. **Section 10.6** of EIAR **Volume 3**, **Chapter 10 Ornithology** is unchanged, however reference is made in **Section 10.6** of the **EIAR Addendum** to a suite of additional ornithology surveys undertaken in response to the Commission's FIR. Additional surveys undertaken since the submission of the CWP Project planning application include: Tern and Black Guillemot surveys undertaken at the onshore substation site in 2025. The results are provided in **Appendix 10-A Tern and Black Guillemot Survey Report** of the **EIAR Addendum**; Coastal vantage point surveys, boat-based transect surveys of the array site and surrounding areas and stationary boat-based nocturnal acoustic surveys within the array site. The results of which are provided in **Appendix 10-B Migration Survey Report** of the **EIAR Addendum**; Digital Aerial Surveys (DAS) and boat-based ESAS Surveys, of the array site and surrounding areas. The results of which are provided in in **Appendix 10-C ESAS Survey Report** and **Appendix 10-D Baseline and Contemporary Survey Data Comparison of the EIAR Addendum**; and Intertidal surveys of the OECC landfall area. The results of which are provided in **Appendix 10-E Intertidal Crepuscular Tern Survey Report** and **Appendix 10-F Intertidal Waterbirds Survey Report** of the EIAR Addendum. The additional data, summarised above and in **Section 10.6** of the **EIAR Addendum**, validates and supports the existing baseline characterisation for ornithology presented in **Section 10.6** of EIAR **Volume 3**, **Chapter 10Ornithology**. **Appendix 10-D Baseline and Contemporary Survey Data Comparison** of the **EIAR Addendum** provides a full account as to the validity of the ornithological baseline as a robust and representative dataset upon which to base the assessment. It highlights that for all species, the findings from the new surveys are comparable with those reported in the planning application. In summary, it can be concluded with confidence that the scientific information submitted in support of the planning application, including the **EIAR Addendum**, is relevant and appropriate for drawing robust conclusions.
Chapter 11 Marine Mammals	**Section 11.6** of EIAR **Volume 3**, **Chapter 11 Marine Mammals** describes the study area baseline conditions with respect to marine mammals. In addition to

Topic	Statement
	the site specific surveys, a comprehensive desk-based review was undertaken to inform the baseline characterisation. **Section 11.6** of EIAR **Volume 3**, **Chapter 11 Marine Mammals** is unchanged, however reference is made in **Section 11.6** of the **EIAR Addendum** to **Appendix 11-A Baseline Technical Report Addendum.** This document incorporates newly available data sources (including results from additional site specific surveys and updated species density estimates) which provide a contemporary validation of the original baseline characterisation for marine mammals as presented in EIAR **Volume 4**, **Appendix 11.3 Baseline Technical Report.** In summary, for all receptors, the results validate and support the existing baseline. It can therefore be concluded with confidence that the scientific information submitted in support of the planning application, including the **EIAR Addendum**, is relevant and appropriate for drawing robust conclusions.
Chapter 12 Commercial Fisheries	**Section 12.6** of EIAR **Volume 3**, **Chapter 12 Commercial Fisheries** describes the study area baseline conditions with respect to commercial fisheries. Commercial fisheries scouting surveys alongside a comprehensive desk-based review of relevant data sources were undertaken to inform the baseline characterisation. For commercial fisheries the baseline characterisation is designed to represent long-term activity patterns using multi year datasets that account for natural variability (see Table 12-2 of EIAR **Volume 3**, **Chapter 12 Commercial Fisheries**). The interval since the data was collected and analysed for the purposes of the EIA is considered negligible in the context of the timescales needed for meaningful change. It can therefore be concluded with confidence that the scientific information submitted in support of the planning application remains relevant and appropriate for drawing robust conclusions. Notwithstanding the above, an update to EIAR Volume 3, **Chapter 12 Commercial Fisheries** has been made to account for the latest available statistics from the Sea-Fisheries Protection Authority (SFPA). This information adds to the baseline described in the EIAR, and is provided in **Section 12 Commercial Fisheries** of the **EIAR Addendum**. It can therefore be concluded with confidence that the scientific information submitted in support of the planning application, including the **EIAR Addendum**, remains relevant and appropriate for drawing robust conclusions.
Chapter 13 Offshore Bats	**Section 13.6** of EIAR **Volume 3**, **Chapter 13 Offshore Bats** describes the study area baseline conditions with respect to offshore bats. Site specific bat activity surveys alongside a comprehensive desk-based review of relevant data sources was undertaken to inform the baseline characterisation. An update to **Section 13.6** of EIAR **Volume 3**, **Chapter 13 Offshore Bats** has been made to summarise new data obtained in 2025 from a repeat of the 2022 migratory land-based (headland) surveys, undertaken in response to item 14a of the Commission's FIR. The additional data, summarised in **Section 13.6** of the **EIAR Addendum**, validates and supports the existing baseline characterisation for offshore bats presented in **Section 13.6** of EIAR **Volume 3**, **Chapter 13 Offshore Bats**. In addition to repeating the migratory headland surveys, the Applicant, in response to item 15a of the Commission's FIR, also undertook boat based bat detection surveys within the array site. This information adds to the

Topic	Statement
	baseline described in the EIAR, and is summarised in **Section 13.6** of the **EIAR Addendum**. Full details of the additional surveys undertaken since the submission of the CWP Project planning application, including the survey methods and results, are provided in **Appendix 13-A Offshore Bat Survey Report 2025** of the **EIAR Addendum**. This appendix provides a comparison of the 2022 and 2025 headland survey data which shows similar levels of activity across the different species. The new data validates and supports the existing baseline characterisation presented in EIAR **Volume 3**, **Chapter 13 Offshore Bats** of the EIAR. It can therefore be concluded with confidence that the scientific information submitted in support of the planning application, including the **EIAR Addendum**, is relevant and appropriate for drawing robust conclusions.
Chapter 14 Marine Archaeology & Cultural Heritage	**Section 14.6** of EIAR **Volume 3**, **Chapter 14 Marine Archaeology & Cultural Heritage** describes the study area baseline conditions with respect to marine archaeology and culture heritage. In addition to site-specific geophysical surveys, a comprehensive desk-based review was undertaken to inform the baseline characterisation. The characterisation of the marine archaeological resources remains appropriate to inform mitigation measures, which have been drafted into a Marine Archaeological Management Plan (MAMP) which has been agreed with the UAU and accompanies this FIR response. The mitigation measures address both known and unknown heritage assets, and provide for analysis of future data, ensuring the assessment remains valid over time. It can therefore be concluded with confidence that baseline archaeological conditions have not change in any meaningful way since the data was collected and analysed for the purposes of the EIA. Therefore, the scientific information submitted in support of the planning application, including the **EIAR Addendum**, remains relevant and appropriate for drawing robust conclusions.
Chapter 15 Seascape, Landscape and Visual Impact Assessment	**Section 15.6** of EIAR **Volume 3**, **Chapter 15 Seascape, Landscape and Visual Impact Assessment** (SLVIA) describes the study area baseline conditions with respect to seascape, landscape / townscape, national designated landscapes and visual receptors. In addition to field surveys, a comprehensive desk-based review was undertaken to inform the baseline characterisation. The baseline characterisation for SLVIA has not changed in any meaningful way since the baseline was established for the purposes of the EIA. The key character areas and designations remain as per the characterisation presented within the application, with the wider receiving environment such as viewpoints similarly remaining as per the characterisation. No new offshore developments have been constructed within the study area that would alter the baseline, and no significant changes in landscape policy have occurred. Therefore, the scientific information submitted in support of the planning application, including the **EIAR Addendum**, remains relevant and appropriate for drawing robust conclusions.
Chapter 16 Shipping and Navigation	**Section 16.6** of EIAR **Volume 3**, **Chapter 16 Shipping and Navigation** describes the study area baseline conditions with respect to shipping and navigation. In addition to the site-specific vessel traffic surveys, a

Topic	Statement
	comprehensive desk-based review was undertaken to inform the baseline characterisation. Radar vessel traffic surveys completed to inform the EIAR baseline were repeated in 2025 and 2026. These are described in **Section 16.6** of the **EIAR Addendum** (including **Appendix 16-B Navigational Risk Assessment Addendum**). The 2025 and 2026 data validates and supports the existing baseline characterisation presented in EIAR **Volume 3**, **Chapter 16 Shipping and Navigation** of the EIAR. It can therefore be concluded with confidence that the scientific information submitted in support of the planning application, including the **EIAR Addendum**, is relevant and appropriate for drawing robust conclusions.
Chapter 17 Aviation, Military and Radar	**Section 17.6** of EIAR **Volume 3**, **Aviation, Military and Radar** describes the study area baseline conditions with respect to aviation, military and radar. In addition to a site-specific Instrument Flight Procedure (IFP) assessment survey, a comprehensive desk-based review was undertaken to inform the baseline characterisation. Baseline conditions relating to elements such as airspace structure, aviation activity, radar coverage and military operational areas are governed by regulated systems and established infrastructure, and have not meaningfully changed in the intervening period. There have been no major changes since the baseline was established for the purposes of the EIA. Furthermore, further consultation with AirNav Ireland and Dublin Airport Authority in response to the Commission's FIR has since established that there will be no meaningful interaction with Dublin Airport radar systems (see **Appendix N - Letter from AirNav Ireland r.e. Dublin Airport** of the **FIR Response Document**). As such, the potential for project alone effects is considered to be negligible. It can therefore be concluded with confidence that the scientific information submitted in support of the planning application, including the **EIAR Addendum**, remains relevant and appropriate for drawing robust conclusions.
Chapter 18 Material Assets: Marine Infrastructure	**Section 18.6** of EIAR **Volume 3**, **Material Assets - Marine Infrastructure** describes the study area baseline conditions with respect to existing marine infrastructure, such as existing cables and pipelines. Geophysical surveys of the offshore development alongside a comprehensive desk-based review of relevant data sources were undertaken to inform the baseline characterisation. Baseline conditions relate primarily to fixed, engineered installations with long operational lifetimes. No new subsea infrastructure has been constructed within the study area since the baseline was established for the purposes of the EIA. It can therefore be concluded with confidence that the scientific information submitted in support of the planning application, including the **EIAR Addendum**, remains relevant and appropriate for drawing robust conclusions.
Chapter 19 Land Soils and Geology	**Section 19.6** of EIAR **Volume 3**, **Chapter 19 Land, Soils and Geology** describes the study area baseline conditions with respect to land, soils and geology. The description of the baseline environment is informed by a wide variety of data sources, including desk-based resources and site investigations. The baseline characterisation of land, soils and geology resources remains appropriate to inform the mitigation measures set out in **Volume 3**, **Chapter 19 Land, Soils and Geology** and **Volume 4**, **Appendix 19.5 Contamination Risk Assessment**. The key baseline classifications for aspects such as soils and

Topic	Statement
	bedrock remain as per the EIAR characterisation. The mitigation measures provide for analysis of future data such as site investigations, ensuring the assessment remains valid over time. It can therefore be concluded with confidence that the scientific information submitted in support of the planning application remains relevant and appropriate for drawing robust conclusions.
Chapter 20 Hydrology and Hydrogeology	**Section 20.6** of EIAR **Volume 3**, **Chapter 20 Hydrology and Hydrogeology** describes the study area baseline conditions with respect to hydrology and hydrogeology. The description of the baseline environment is informed by a wide variety of data sources, including desk-based resources, site investigations and groundwater monitoring. The update to the Water Framework Directive (WFD) Status Report from 2016-2021 to 2019-2024 is noted. There was no change made to the status of groundwater bodies or transitional waters. However, an updated WFD Assessment is included in **Appendix 7-A Water Framework Directive Assessment** of the **EIAR Addendum**. The baseline characterisation of hydrology and hydrogeology resources remains appropriate to inform the mitigation measures set out in **Volume 3**, **Chapter 20 Hydrology and Hydrogeology**. The key designations and classifications remain as per the EIAR characterisation. It can therefore be concluded with confidence that the scientific information submitted in support of the planning application remains relevant and appropriate for drawing robust conclusions.
Chapter 21 Onshore Biodiversity	**Section 21.6** of EIAR **Volume 3**, **Chapter 21 Onshore Biodiversity** describes the study area baseline conditions with respect to onshore biodiversity. The description of the baseline environment is informed by a wide variety of data sources, including desk-based resources and on-site surveys. Additional onshore biodiversity surveys undertaken since the submission of the CWP Project planning application include field surveys targeting bats, otters and badgers. These surveys were undertaken in 2025. The results of these surveys have been incorporated into **Section 21** of the **EIAR Addendum (Part 2)**, supported by **Appendix 21-A Badger and Otter Survey Report 2025** and **Appendix 21-B Bat Assessment 2025**. The new data for bats, otters and badgers validates and supports the existing baseline characterisation presented in EIAR **Volume 3, Chapter 21 Onshore Biodiversity** The characterisation of onshore biodiversity receptors remains appropriate to inform the mitigation measures set out in **Volume 3**, **Chapter 21 Onshore Biodiversity.** The key baseline designations and classifications remain as per the characterisation. The mitigation measures provide for analysis of future data such as preconstruction surveys, ensuring the assessment remains valid over time. Therefore, the scientific information submitted in support of the planning application, including the **EIAR Addendum**, remains relevant and appropriate for drawing robust conclusions.
Chapter 22 Onshore Archaeology, Architectural and Cultural Heritage	**Sections 22.1.6** and **22.2.6** of EIAR **Volume 3**, **Chapter 22 Onshore Archaeology, Architectural and Cultural Heritage** describes the study area baseline conditions with respect to archaeological, architectural and cultural

Topic	Statement
	heritage. A comprehensive desk-based review and site walkover was undertaken to inform the baseline characterisation. The interval since the data was collected and analysed for the purposes of the EIA is considered negligible in the context of the timescales needed for meaningful change. The baseline characterisation of the archaeological, architectural and cultural resources remains appropriate to inform the mitigation measures set out in **Volume 3**, **Chapter 22 Onshore Archaeology, Architectural & Cultural Heritage**. The mitigation measures address both known and unknown heritage assets, and provide for analysis of future data, ensuring the assessment remains valid over time. It can therefore be concluded with confidence that the scientific information submitted in support of the planning application remains relevant and appropriate for drawing robust conclusions.
Chapter 23 Landscape and Visual Impact Assessment	**Section 23.6** of EIAR **Volume 3**, **Chapter 23 Landscape and Visual Impact Assessment** (LVIA) describes the study area baseline conditions with respect to landscape/townscape and visual receptors. The landscape and visual baseline has been recorded in terms of landscape/townscape character descriptions and viewpoint photography. In addition to field surveys, a comprehensive desk-based review was undertaken to inform the baseline characterisation. The interval since the characterisation of the baseline for the purposes of the EIA is considered negligible in the context of the timescales needed for meaningful change. There may have been some minor changes to character and views during the intervening period. However, the landscape/townscape and visual resource is characterised by industrial and commercial development in close proximity to the proposed development and by urban development and infrastructure further afield. Therefore, minor changes to this receiving environment are highly unlikely to materially alter the susceptibility or sensitivity of the baseline receptors. Consequently, the baseline data remains relevant for drawing conclusions on likely significant effects in the context of EIA. The scientific information submitted in support of the planning application, including the **EIAR Addendum**, remains relevant and appropriate for drawing robust conclusions.
Chapter 24 Noise and Vibration	**Sections 24.5** of EIAR **Volume 3**, **Chapter 24 Noise and Vibration** describes the study area baseline conditions with respect to the existing noise environment. A comprehensive desk-based review and baseline noise monitoring was undertaken to inform the baseline characterisation. The baseline characterisation relating to the noise environment has not changed in any meaningful way since this was established for the purposes of the EIA. Where changes may have occurred within the study area, this has occurred within the context of an already industrialised and developed environment and would not alter the receptor sensitivity rating assigned to Noise Sensitive Locations (NSLs). Where updated baseline noise data has been published, this would be highly unlikely to make any material change to the baseline characterisation. Additionally, in terms of NSLs, the EIAR assessment accounted for planned residential development such as the nearby Irish Glass Bottle Site

Topic	Statement
	and on this basis, there are no updates to proposed receptors or their assigned sensitivity. The characterisation of the noise environment remains appropriate to inform the mitigation measures set out in **Volume 3**, **Chapter 24 Noise and Vibration**. It can therefore be concluded with confidence that the scientific information submitted in support of the planning application remains relevant and appropriate for drawing robust conclusions
Chapter 25 Air Quality	**Sections 25.6** of EIAR **Volume 3**, **Chapter 25 Air Quality** describes the study area baseline conditions with respect to air quality. A comprehensive desk-based review was undertaken to inform the baseline characterisation. The baseline characterisation relating to the air quality environment has not changed in any meaningful way since this was established for the purposes of the EIA. Although there may be small changes in background concentrations, this is set within the context of an already industrialised and developed environment. In terms of air quality receptors, the EIAR assessment accounted for the planned residential development at the nearby Irish Glass Bottle Site and on this basis, there are no updates to proposed receptors or their assigned sensitivity. Furthermore, there have been no changes in project design (and associated construction traffic volumes) that would undermine the basis of the assessment. The characterisation of the air quality environment remains appropriate to inform the mitigation measures set out in **Volume 3**, **Chapter 25 Air Quality**. It can therefore be concluded with confidence that the scientific information submitted in support of the planning application remains relevant and appropriate for drawing robust conclusions.
Chapter 26 Material Assets – Built Services	**Section 26.6** of EIAR **Volume 3**, **Chapter 26 Material Assets – Built Services** describes the study area baseline conditions with respect to existing built services, such as electrical, gas and water utilities. A comprehensive desk-based review of relevant data sources and site specific surveys were undertaken to inform the baseline characterisation. Baseline conditions relate primarily to fixed, engineered installations with long operational lifetimes. Where utility changes may have occurred, this has happened within an industrialised and developed environment. These changes would not alter the baseline classifications already assigned to the utility assets. The characterisation of the built services environment remains appropriate to inform the mitigation measures set out in **Volume 3**, **Chapter 26 Material Assets – Built Services**. It can therefore be concluded with confidence that the scientific information submitted in support of the planning application remains relevant and appropriate for drawing robust conclusions.
Chapter 27 Traffic and Transport	**Section 27.6** of EIAR **Volume 3**, **Chapter 27 Traffic and Transport** describes the study area baseline conditions with respect to traffic and transport which includes the surrounding road network and pedestrian and cyclist accessibility. A comprehensive desk-based review of relevant data sources and site specific traffic counts were undertaken to inform the baseline characterisation. The baseline characterisation for the road network and pedestrian and cyclist infrastructure has not changed in any meaningful way since the baseline was established for the purposes of the EIA. The assessment in EIAR **Volume 3**,

Topic	Statement
	Chapter 27 Traffic and Transport also incorporated growth based factors into the traffic flows assessed for future years. The characterisation of the traffic and transport environment remains appropriate to inform the mitigation measures set out in **Volume 3**, **Chapter 27 Traffic and Transport** and **Volume 4**, **Appendix 27.2 Traffic Management Plan** of the EIAR. It can therefore be concluded with confidence that the scientific information submitted in support of the planning application remains relevant and appropriate for drawing robust conclusions.
Chapter 28 Climate – Carbon Balance Assessment	**Sections 28.6** of EIAR **Volume 3**, **Chapter 28 Climate – Carbon Balance Assessment** describes the study area baseline conditions and policy framework with respect to greenhouse emissions and climate. With regards to the greenhouse gas emissions assessment (GHGA) there have been no significant changes in climate policy that would alter the basis of the assessment and no changes in project design or published carbon emission factors that would require a recalculation of the projects GHG emissions. However, **Section 28** of **EIAR Addendum (Part 2)** provides updates to EIAR **Volume 3**, **Chapter 28 Climate – Carbon Balance Assessment** in response to the Commission's FIR. The core conclusion of the assessment, that the CWP Project will have direct, positive, long-term and significant effect on climate, remains consistent with the EIAR. With regards to the climate change risk assessment (CCRA), the interval since data was collected is not sufficient to alter the project's sensitivity or exposure to climate hazards. It can therefore be concluded with confidence that the scientific information submitted in support of the planning application remains relevant and appropriate for drawing robust conclusions.
Chapter 29 Population	**Section 29.6** of EIAR **Volume 3**, **Chapter 29 Population** describes the study area baseline conditions with respect to population, amenity, land use, tourism, recreation and socio economics. A comprehensive desk-based review was undertaken to inform the baseline characterisation. An update to **Section 29.6** of EIAR **Volume 3**, **Chapter 29 Population** has been made to summarise new desk based tourism and recreation data collated in 2025. The data adds to the existing baseline and is summarised in **Section 29.6** of the **EIAR Addendum (Part 2)**. The 2025 data validates and supports the existing baseline characterisation presented in **Section 29.6** of EIAR **Volume 3**, **Chapter 29 Population**. It can therefore be concluded with confidence that the scientific information submitted in support of the planning application, including the **EIAR Addendum**, is relevant and appropriate for drawing robust conclusions.
Chapter 30 Human Health	**Section 30.6** of EIAR **Volume 3**, **Chapter 30 Human Health** describes the study area baseline conditions with respect to human health. The baseline characterisation relative to health statistics has not changed in any meaningful way since the baseline was established for the purposes of the EIA. Any additional or newly published data would not make a material change to the baseline characterisation. **Section 30.6** of EIAR **Volume 3**, **Chapter 30 Human Health** draws on information associated with other topics including **Volume 3**, **Chapter 19 Land, Soils and Geology**, **Chapter 20 Hydrology and Hydrogeology**, **Chapter 24**

Topic	Statement
	Noise and Vibration, **Chapter 25 Air Quality**, and **Chapter 27 Traffic and Transport.** Validation for these topics is addressed under their individual headings in this Appendix. It can therefore be concluded with confidence that the scientific information submitted in support of the planning application remains relevant and appropriate for drawing robust conclusions.
Chapter 31 Waste and Resource Management	**Section 31.6** of EIAR **Volume 3**, **Chapter 31 Waste and Resource Management** describes the study area baseline conditions with respect to waste infrastructure and waste generation statistics. A comprehensive desk-based review of relevant data sources was undertaken to inform the baseline characterisation. The baseline environment for waste and resource management has not changed in any meaningful way since the baseline was established for the purposes of the EIA. Any additional or newly published data would not make a material change to the baseline characterisation and the sensitivity rating assigned to waste infrastructure would not change. Waste and resource assessments are largely project-design based and there have been no changes in project design that would alter the basis of the assessment. The characterisation of the waste environment remains appropriate to inform the mitigation measures set out in EIAR **Volume 3**, **Chapter 31 Waste and Resource Management** and in the updated **Construction and Demolition Waste Management Plan (CDWMP)** submitted with the Applicant's FIR response. It can therefore be concluded with confidence that the scientific information submitted in support of the planning application remains relevant and appropriate for drawing robust conclusions.
Chapter 32 Risk of Major Accidents and Disasters	**Section 32.6** of EIAR **Volume 3**, **Chapter 32 Risk of Major Accidents and Disasters** describes the study area baseline conditions for key aspects such as infrastructure, licensed sites, built services and SEVESO establishments. The baseline characterisation has not changed in any meaningful way since the baseline was established for the purposes of the EIA. Any additional or newly published data would not make a material change to the baseline characterisation. It would not alter the likelihood or consequence ratings concluded in the risk assessment. It can therefore be concluded with confidence that the scientific information submitted in support of the planning application remains relevant and appropriate for drawing robust conclusions.



codling wind park

FIR Response Document

Appendix D - Letter from IRCG r.e. Safety Justification

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An Roinn Iompair
Department of Transport

Garda Cósta na hÉireann
IRISH COAST GUARD

Mr. Micheál O'Toole
Director,
Irish Coast Guard,
Department of Transport,
2 Lesson Lane,
Dublin 2

11th February 2026

Erlend Christiansen,
Offshore Licensing Manager,
Codling Wind Park Limited,
Five South County, 2nd Floor,
South County Business Park,
Leopardstown,
Dublin,
Ireland

RE: REQUEST FOR FURTHER INFORMATION PROCESS IN THE APPLICATION TO AN BORD PLEANÁLA, UNDER SECTION 291 OF THE PLANNING AND DEVELOPMENT ACT 2000 (AS AMENDED) FOR PERMISSION FOR CODLING WIND PARK – ABP CASE NUMBER: ABP-320768-24

Codling Wind Park Limited

Dear Erlend,

The Irish Coast Guard is a division within the Department of Transport and is not a separate legal entity to the Department. The Irish Coast Guard is a prescribed body under S.I. 100/2023 – Planning and Development (Maritime Development) Regulations 2023, however it remains a division of the Department of Transport.

On the 12th November 2024, Irish Coast Guard made a submission (attached) on the above planning application, raising concerns in relation to Search & Rescue (SAR).

By way of letter from An Coimisiún Pleanála dated 1st August 2025 addressed to the applicant, the applicant was requested to consult with the Irish Coast Guard, to address concerns raised with respect to search and rescue access and provided further information and clarity on such matters. The applicant met with Irish Coast Guard on 9th October 2025 and on 25th November 2025. The applicant must respond with the further information to An Coimisiún Pleanála by the 11th May 2026.

The following documents/files (attached) were submitted to Irish Coast Guard on the 2nd December 2025 for review:

1. A Safety Justification dated 27th November 2025 (Document Reference A5511-CWP-SJ-01) Revision Number 02

The safety justification provides mitigating measures in relation to one line of orientation when searching for a casualty within a wind farm for Layout Option A (75 WTG's) & Option B (60 WTG's).

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With regards to document submitted by the applicant on the 2nd December 2025, the Irish Coast Guard has the following observations:

a. With regards to the potential misalignment of turbines due to micrositing/limit of deviation, the Irish Coast Guard notes the turbine misalignment will be reduced to a minimum

b. Irish Coast Guard makes observations regarding the misalignment of the Offshore Sub-station (OSS) raised in the submission to An Bord Pleanála on the 12th November 2024. Where micro-siting is possible, the OSS should be aligned to the extent practicable with turbines to avoid obstacles in SAR Lanes.

c. The applicant has committed to camera coverage, meteorological monitoring, marine navigational radar and AIS systems in the array. Where technology is available, the applicant should consider the provision of direct data feeds via a suitable mechanism to the Irish Coast Guard. Such systems will be of operational benefit to the Irish Coast Guard for Search & Rescue, maritime casualties and pollution monitoring.

Subject to the implementation of the above observations (a-c), we are content the provisions and mitigations outlined have met the requirements as set out in the National Maritime Oil/HNS Spill Contingency Plan - Standard Operating Procedure 07-2025 Offshore Renewable Energy Installations (OREI): Guidance and Operational Considerations for SAR and Emergency Response and have no further comment at this time.

The applicant will need to submit a detailed Emergency Response Cooperation Plan (ERCoP) to the Irish Coast Guard for review for all phases of the development, subject to granting of planning permission.

We would also ask An Coimisiún Pleanála to consider the three observations (a-c) above and the provisions and mitigations as set out in safety justification document are mandated as a condition of any planning decision to grant approval to the development. It is requested that this letter, inclusive of attachments, be forwarded to An Coimisiún Pleanála.

For and on behalf of the Irish Coast Guard

DocuSigned by:
Michael O'Toole
BC6A04EAC22C40E...

Micheál O'Toole

Director
Irish Coast Guard
Department of Transport



codling wind park

FIR

FIR Response Document

Appendix E - Marine Guidance Note 654 Compliance Checklist


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wind park

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Abbreviations

Abbreviation	Term in Full
AIS	Automatic Identification System
ATBA	Area to be Avoided
CCTV	Closed Circuit Television
CWP	Codling Wind Park.
DSC	Digital Selective Calling
EIAR	Environmental Impact Assessment Report
EMF	Electromagnetic Field
ESRI	Environmental Systems Research Institute
ETRS89	European Terrestrial Reference System 1989
FSA	Formal Safety Assessment
GIS	Geographical Information System
GLA	General Lighthouse Authority
GMDSS	Global Maritime Distress and Safety System
HWM	High Water Mark
IMO	International Maritime Organization
IRCG	Irish Coastguard
km	Kilometre
m	Metre
MCA	Maritime and Coastguard Agency
MCIB	Marine Casualty Investigation Board
MGN	Marine Guidance Note
MSI	Maritime Safety Information
MSO	Marine Survey Office
nm	Nautical Mile
NRA	Navigational Risk Assessment
OREI	Offshore Renewable Energy Installation
PEXA	Practice and Exercise Area
PNT	Positioning Navigation and Timing
RNLI	Royal National Lifeboat Institution
UK	United Kingdom
VHF	Very High Frequency
VTS	Vessel Traffic Services
WTG	Wind Turbine Generator

Definitions

Glossary	Meaning
Allision	The act of striking or collision of a moving vessel against a stationary object.
The Applicant	The developer, Codling Wind Park Limited (CWPL)
Array site	The red line boundary area within which the wind turbine generators (WTGs), inter-array cables (IACs) and the Offshore Substation Structures (OSSs) are proposed.
Automatic Identification System (AIS)	A system by which vessels automatically broadcast their identity, key statistics including location, destination, length, speed and current status, e.g., under power. Most commercial vessels and United Kingdom (UK) / European Union (EU) fishing vessels over 15 m length are required to carry AIS.
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.
Collision	The act or process of colliding (contact) between two moving objects.
Environmental Impact Assessment (EIA)	A systematic means of assessing the likely significant effects of a proposed project, undertaken in accordance with the EIA Directive and the relevant Irish legislation.
Environmental Impact Assessment Report (EIAR)	The report prepared by the Applicant to describe the findings of the EIA for the CWP Project.
Export cables	The cables, both onshore and offshore, that connect the offshore substations with the onshore substation.
Export cable study area	A 2 nautical mile (nm) buffer of the offshore export cable corridor.
Formal Safety Assessment (FSA)	A structured and systematic process for assessing the risks and costs (if applicable) associated with shipping activity.
Inter-array cables (IACs)	The subsea electricity cables between each WTG between and the OSSs.
Interconnector cables	The subsea electricity cables between OSSs
Landfall	The point at which the offshore export cables are brought onshore and connected to the onshore export cables via the transition joint bays (TJB). For the CWP Project The landfall works include the installation of the offshore export cables within Dublin Bay out to approximately 4 km offshore, where water depths that are too shallow for conventional cable lay vessels to operate.

Glossary	Meaning
Marine Guidance Note (MGN)	A system of guidance notes issued by the Maritime and Coastguard Agency (MCA) which provide significant advice relating to the improvement of the safety of shipping at sea, and to prevent or minimise pollution from shipping.
Navigational Risk Assessment (NRA)	A document which assesses the hazards to shipping and navigation of a proposed Offshore Renewable Energy Installation (OREI) based upon the FSA.
Offshore export cables	The cables which transport electricity generated by the WTGs from the offshore substations (OSSs) to the TJBs at the landfall.
Offshore export cable corridor (OECC)	The area between the array site and the landfall, within which the offshore export cables cable will be installed along with cable protection and other temporary works for construction.
Offshore Renewable Energy Installation (OREI)	As defined by Marine Guidance Note 654 (Merchant and Fishing) Safety of Navigation: Offshore Renewable Energy Installations (OREIs) – Guidance on UK Navigational Practice, Safety and Emergency Response (Maritime and Coastguard Agency (MCA), 2021). For the purposes of this report and in keeping with the consistency of the Environmental Impact Assessment (EIA), OREI can mean offshore wind turbines and the associated electrical infrastructure including offshore substations.
Offshore substation structure (OSS)	A fixed structure located within the array site, containing electrical equipment to aggregate the power from the wind turbine generators and convert it into a more suitable form for export to shore.
Radio Detection and Ranging (Radar)	An object-detection system which uses radio waves to determine the range, altitude, direction or speed of objects.
Regular Operator	Commercial operator whose vessel(s) are observed to transit through a particular region on a regular basis.
Study area	A 10 nm buffer of the array site boundary.
Traffic Separation Scheme (TSS)	A traffic-management route-system ruled by the International Maritime Organization (IMO). The traffic-lanes (or clearways) indicate the general direction of the vessels in that zone; vessels navigating within a TSS all sail in the same direction or they cross the lane in an angle as close to 90 degrees (°) as possible.

1 Introduction

1. Codling Wind Park Limited (hereafter 'the Applicant') is proposing to develop the Codling Wind Park (CWP) Project, which is located in the Irish sea approximately 13 - 22 kilometres (km) off the east coast of Ireland, at County Wicklow.

2. This appendix forms part of the Applicant's response to Item 2b in the **Commission's FIR** and supports **Section 16** of the **Environmental Impact Assessment Report (EIAR) Addendum**.

2 Marine Guidance Note 654 Checklist

3. The Marine Guidance Note (MGN) 654 Checklist can be divided into two distinct checklists, one considering the main MGN 654 guidance document and one considering the Methodology for Assessing Marine Navigational Safety and Emergency Response Risks of Offshore Renewable Energy Installations (OREIs) (Maritime and Coastguard Agency (MCA), 2021) which serves as Annex 1 to MGN 654.

4. The checklist for the main MGN 654 guidance document is presented in Table 1. Following this, the checklist for the MCA's methodology annex is presented in Table 2. For both checklists, references to where the relevant information and/ or assessment is provided in the EIAR or Navigational Risk Assessment (NRA) is given. Note that the tables refer to the volumes and chapters of the EIAR, unless otherwise stated.

Table 1 MGN 654 Checklist for main document

Issue	Compliance	Comments
Site and Installation Coordinates. Developers are responsible for ensuring that formally agreed coordinates and subsequent variations of site perimeters and individual OREI structures are made available, on request, to interested parties at relevant project stages, including application for consent, development, array variation, operation and decommissioning. This should be supplied as authoritative Geographical Information System (GIS) data, preferably in Environmental Systems Research Institute (ESRI) format. Metadata should facilitate the identification of the data creator, its date and purpose, and the geodetic datum used. For mariners' use, appropriate data should also be provided with latitude and longitude coordinates in WGS84 (European Terrestrial Reference System 1989 (ETRS89)) datum.		
Traffic Survey. Includes:		
All vessel types.	✓	**Volume 4, Appendix 16.3 Section 11: Vessel Traffic** All vessel types are considered with specific breakdowns by vessel type given within the study area.
At least 28 days duration, within either 12 or 24 months prior to submission of the EIAR.	✓	**Volume 4, Appendix 16.3 Section 5: Data Sources** Two vessel traffic surveys totalling 28 days were undertaken to inform the EIAR. A further two vessel traffic surveys totalling 28 days were undertaken to inform the FIR

Issue	Compliance	Comments
		submission and confirm the findings of the NRA remain valid.
Multiple data sources.	✓	**Volume 4, Appendix 16.3 Section 5: Data Sources** The vessel traffic survey data includes Automatic Identification System (AIS), Radar and visual observations to maximise coverage of vessels not broadcasting on AIS. Long-term vessel traffic data recorded on AIS have also been considered. Noted that two vessel traffic surveys totalling 28 days were undertaken to inform the EIAR. A further two vessel traffic surveys totalling 28 days were undertaken to inform the FIR submission and confirm the findings of the NRA remain valid.
Seasonal variations.	✓	**Volume 4, Appendix 16.3 Section 5: Data Sources** **Volume 4, Appendix 16.3 Annex B: Long-Term Vessel Traffic Movements** To assist with the assessment of seasonal variation a long-term AIS dataset covering 12 months in 2021 has also been assessed.
MCA consultation.	✓	**Volume 4, Appendix 16.3 Section 4: Consultation** The Irish equivalent of MCA include the Marine Survey Office (MSO) and the Irish Coastguard (IRCG) and both have been consulted as part of the NRA process including through the Hazard Workshop.
General Lighthouse Authority (GLA) consultation.	✓	**Volume 4, Appendix 16.3 Section 4: Consultation** Irish Lights and have been consulted as part of the NRA process including through the Hazard Workshop.
United Kingdom (UK) Chamber of Shipping consultation.	✓	**Volume 4, Appendix 16.3 Section 4: Consultation** The Irish Chamber of Shipping was invited to take part in the consultation

Issue	Compliance	Comments
		process of the NRA process including through the Hazard Workshop.
Recreational and fishing vessel organisations consultation.	✓	**Volume 4, Appendix 16.3 Section 4: Consultation** Various recreational organisations were invited to the Hazard Workshop with Poolbeg Yacht and Boat club and Royal Irish Yacht Club attending.
Port and navigation authorities consultation, as appropriate.	✓	**Volume 4, Appendix 16.3 Section 4: Consultation** Authorities including Dublin Port Company and Dun Laoghaire Harbour have been consulted as part of the NRA process including through the Hazard Workshop.
Assessment of the cumulative and individual effects of (as appropriate):		
i. Proposed OREI site relative to areas used by any type of marine craft.	✓	**Volume 4, Appendix 16.3 Section 11: Vessel Traffic** Vessel traffic data in proximity to the CWP Project has been analysed. **Volume 3, Chapter 16, Section 16.10: Impact Assessment** The hazards due to the CWP Project have been assessed for each phase in isolation and for cumulative scenarios – Section 11.
ii. Numbers, types and sizes of vessels presently using such areas.	✓	**Volume 4, Appendix 16.3 Section 11: Vessel Traffic** Vessel traffic data in proximity to the CWP Project has been analysed and includes breakdowns of daily vessel count, vessel type and vessel size.
iii. Non-transit uses of the areas, e.g., fishing, day cruising of leisure craft, racing, aggregate dredging, personal watercraft, etc.	✓	**Volume 4, Appendix 16.3 Section 7: Navigational Features** Non-transit uses of the areas in proximity to the CWP Project have been identified, including pilotage and anchoring. **Volume 4, Appendix 16.3 Section 11: Vessel Traffic** Non-transit users were identified in the vessel traffic survey data and included fishing vessels engaged in

Issue	Compliance	Comments
		fishing activities, recreational activities, and anchoring activities.
iv. Whether these areas contain transit routes used by coastal or deep-draught vessels on passage.	✓	**Volume 4, Appendix 16.3 Section 12: Base Case Vessel Routeing** Main commercial routes have been identified using the principles set out in MGN 654 in proximity to the CWP Project, with these routes taking into account coastal, deep-draught and internationally scheduled vessels.
v. Alignment and proximity of the site relative to adjacent shipping lanes.	✓	**Volume 4, Appendix 16.3 Section 7: Navigational Features** Section 7.7 identifies International Maritime Organization (IMO) routeing measures in proximity to the CWP Project.
vi. Whether the nearby area contains prescribed routeing schemes or precautionary areas.	✓	**Volume 4, Appendix 16.3 Section 7: Navigational Features** Section 7.7 identifies the IMO routeing measures in proximity to the CWP Project and Section 7.9 identifies military practice and exercise areas (PEXAs) in proximity to the CWP Project.
vii. Proximity of the site to areas used for anchorage (charted or uncharted), safe haven, port approaches and pilot boarding or landing areas.	✓	**Volume 4, Appendix 16.3 Section 7: Navigational Features** Section 7.5 identifies port approaches and pilot boarding stations in proximity to the CWP Project and Section 7.4 identifies anchorage areas in proximity to the CWP Project.
viii. Whether the site lies within the jurisdiction of a port and/ or navigation authority.	✓	**Volume 4, Appendix 16.3 Section 7: Navigational Features** Section 7.5 identifies the locations of ports in proximity to the CWP Project.
ix. Proximity of the site to existing fishing grounds, or to routes used by fishing vessels to such grounds.	✓	**Volume 4, Appendix 16.3 Section 11: Vessel Traffic** Fishing vessel movements are considered within the study area. Detailed analysis of dedicated fishing vessel activities is undertaken in Volume 3, Chapter 12 (of the EIAR): Commercial fisheries.
x. Proximity of the site to offshore firing/ bombing ranges and areas	✓	**Volume 4, Appendix 16.3 Section 7: Navigational Features**

Issue	Compliance	Comments
used for any marine military purposes.		Section 7.9 identifies military PEXAs in proximity to the CWP Project.
xi. Proximity of the site to existing or proposed submarine cables or pipelines, offshore oil/ gas platforms, marine aggregate dredging, marine archaeological sites or wrecks, Marine Protected Areas or other exploration/ exploitation sites.	✓	**Volume 4, Appendix 16.3 Section 7: Navigational Features** Section 7.2 identifies the submarine cables and pipelines in proximity to the CWP Project, and Section 7.8 identifies the charted wrecks in proximity to the CWP Project. **Volume 4, Appendix 16.1: Cumulative Effects Assessment** Considers exploration/ exploitation sites in proximity to the CWP Project cumulatively.
xii. Proximity of the site to existing or proposed OREI developments, in cooperation with other relevant developers, within each round of lease awards.	✓	**Section 7 (of the NRA): Navigational Features** Section 7.1 identifies other offshore wind farm developments in proximity to the CWP Project. **Volume 4, Appendix 16.1: Cumulative Effects Assessment** Considers exploration/ exploitation sites in proximity to the CWP Project cumulatively.
xiii. Proximity of the site relative to any designated areas for the disposal of dredging spoil or other dumping ground.	✓	**Volume 4, Appendix 16.3 Section 7: Navigational Features** Figure 7.2 identifies spoil grounds in proximity to the CWP Project.
xiv. Proximity of the site to aids to navigation and/ or Vessel Traffic Services (VTS) in or adjacent to the area and any impact thereon.	✓	**Volume 4, Appendix 16.3 Section 7: Navigational Features** Section 7.3 identifies aids to navigation in proximity to the CWP Project. There are no intersecting VTS.
xv. Researched opinion using computer simulation techniques with respect to the displacement of traffic and, in particular, the creation of 'choke points' in areas of high traffic density and nearby or consented OREI sites not yet constructed.	✓	**Volume 4, Appendix 16.3 Section 14: Collision and Allision Risk Modelling** Provides quantification of collision and allision risk resulting from the CWP Project including pinch (or choke) points in proximity to the CWP Project.
xvi. With reference to xv. above, the number and type of incidents	✓	**Volume 4, Appendix 16.3 Section 10: Maritime Incidents**

Issue	Compliance	Comments
to vessels which have taken place in or near to the proposed site of the OREI to assess the likelihood of such events in the future and the potential impact of such a situation.		Historical vessel incident data published Royal National Lifeboat Institution (RNLI) (Section 10.1) and Marine Casualty Investigation Board (MCIB) (Section 10.2) in proximity to the CWP Project has been considered alongside historical offshore wind farm incident data (Section 10.3).
xvii. Proximity of the site to areas used for recreation which depend on specific features of the area.	✓	**Volume 4, Appendix 16.3 Section 11: Vessel Traffic** Non-transit users were identified in the vessel traffic survey data and included recreational activities.
Predicted effect of OREI on traffic and interactive boundaries. Where appropriate, the following should be determined:		
a. The safe distance between a shipping route and OREI boundaries.	✓	**Volume 4, Appendix 16.3 Section 12.3: Post Wind Farm** A methodology for post wind farm routeing is outlined and includes a minimum distance of 1 nautical mile (nm) from offshore installations and existing offshore wind farm boundaries.
b. The width of a corridor between sites or OREIs to allow safe passage of shipping.	✓	A navigational corridor is not required for the CWP Project.
OREI Structures. The following should be determined:		
a. Whether any feature of the OREI, including auxiliary platforms outside the main generator site, mooring and anchoring systems, inter-device and export cabling could pose any type of difficulty or danger to vessels underway, performing normal operations, including fishing, anchoring and emergency response.	✓	**Volume 4, Appendix 16.3 Section 14: Collision and Allision Risk Modelling** Provides quantification of collision and allision risk resulting from the CWP Project. **Volume 3, Chapter 16, Section 16.10: Impact Assessment** The hazards due to the CWP Project have been assessed for each phase and include consideration of users such as commercial vessels, commercial fishing vessels in transit, recreational vessels, anchored vessels and emergency responders.
b. Clearances of fixed or floating WTG blades above the sea surface are not less than 22	✓	**Volume 4, Appendix 16.3 Section 6: Project Description Relevant to Shipping and Navigation**

Issue	Compliance	Comments
metres (m) (above High Water Mark (HWM) for fixed). Floating turbines allow for degrees of motion.		Section 6.2.2 outlines the shipping and navigation project option with the greatest significance of risk for Wind Turbine Generators (WTGs) including the minimum air gap above HWM.
c. Underwater devices: i. Changes to charted depth; ii. Maximum height above seabed; and iii. Under keel clearance.	✓	**Volume 4, Appendix 16.3 Section 6: Project Description Relevant to Shipping and Navigation** Section 6.3 outlines the shipping and navigation project option with the greatest significance of risk for subsea cables including the cable burial specifications.
d. Whether structures block or hinder the view of other vessels or other navigational features.	✓	**Volume 3, Chapter 16, Section 16.10: Impact Assessment** The hazards due to the CWP Project have been assessed for each phase and include consideration of the potential for vessels navigating in proximity to structures to be visually obscured or inhibit the use of existing aids to navigation.
The effect of tides, tidal streams and weather. It should be determined whether:		
a. Current maritime traffic flows and operations in the general area are affected by the depth of water in which the proposed installation is situated at various states of the tide, i.e. whether the installation could pose problems at high water which do not exist at low water conditions, and vice versa.	✓	**Volume 4, Appendix 16.3 Section 6: Project Description Relevant to Shipping and Navigation** Section 6.1 outlines the project description relevant to shipping and navigation for the array site and includes the range of existing water depths. **Volume 4, Appendix 16.3 Section 8: Meteorological Ocean Data** Section 8.4 provides data relating to various states of the tide. **Volume 4, Appendix 16.3 Section 11: Vessel Traffic** Vessel traffic data in proximity to the CWP Project has been analysed including vessel draught. **Volume 4, Appendix 16.3 Section 14: Collision and Allision Risk Modelling**

Issue	Compliance	Comments
		Provides quantification of collision and allision risk resulting from the CWP Project including accounting for tidal conditions.
b. The set and rate of the tidal stream, at any state of the tide, has a significant effect on vessels in the area of the OREI site.	✓	**Volume 4, Appendix 16.3 Section 8: Meteorological Ocean Data** Section 8.4 provides meteorological data in proximity to the CWP Project relating to various states of the tide. **Volume 4, Appendix 16.3 Section 14: Collision and Allision Risk Modelling** Provides quantification of collision and allision risk resulting from the CWP Project including accounting for tidal conditions.
c. The maximum rate tidal stream runs parallel to the major axis of the proposed site layout, and, if so, its effect.	✓	
d. The set is across the major axis of the layout at any time, and, if so, at what rate.	✓	
e. In general, whether engine failure or other circumstance could cause vessels to be set into danger by the tidal stream, including unpowered vessels and small, low speed craft.	✓	**Volume 4, Appendix 16.3 Section 8: Meteorological Ocean Data** Section 8.4 provides meteorological data in proximity to the CWP Project relating to various states of the tide. **Volume 4, Appendix 16.3 Section 14: Collision and Allision Risk Modelling** Provides quantification of collision and allision risk resulting from the CWP Project including accounting for tidal conditions and assessment of whether machinery failure could cause vessels to be set into danger.
f. The structures themselves could cause changes in the set and rate of the tidal stream.	✓	**Volume 4, Appendix 16.3 Section 8: Meteorological Ocean Data** Section 8.4 provides meteorological data in proximity to the CWP Project relating to various states of the tide and notes that no effects are anticipated.
g. The structures in the tidal stream could be such as to produce siltation, deposition of sediment or scouring, affecting navigable water depths in the wind farm area or adjacent to the area.	✓	**Volume 4, Appendix 16.3 Section 8: Meteorological Ocean Data** Section 8.4 provides meteorological data in proximity to the CWP Project relating to various states of the tide. **Volume 3, Chapter 16, Section 16.10: Impact Assessment**

Issue	Compliance	Comments
		The hazards due to the CWP Project have been assessed for each phase and include consideration of the potential for reduction in under keel clearance.
h. The site, in normal, bad weather, or restricted visibility conditions, could present difficulties or dangers to craft, including sailing vessels, which might pass in close proximity to it.	✓	**Volume 4, Appendix 16.3 Section 8: Meteorological Ocean Data** Provides meteorological data in proximity to the CWP Project relating to weather and visibility. **Volume 4, Appendix 16.3 Section 11: Vessel Traffic** Vessel traffic data in proximity to the CWP Project has been analysed including recreational vessels. **Volume 3, Chapter 16, Section 16.10: Impact Assessment** The outputs of the quantitative modelling which accounts for adverse conditions have fed into assessment of risk from relevant hazards.
i. The structures could create problems in the area for vessels under sail, such as wind masking, turbulence or sheer.	✓	**Volume 3, Chapter 16, Section 16.10: Impact Assessment** The hazards due to the CWP Project have been assessed for each phase and include consideration of internal allision risk for vessels under sail.
j. In general, taking into account the prevailing winds for the area, whether engine failure or other circumstances could cause vessels to drift into danger, particularly if in conjunction with a tidal set such as referred to above.	✓	**Volume 4, Appendix 16.3 Section 8: Meteorological Ocean Data** Provides meteorological data in proximity to the CWP Project relating to wind direction and various states of the tide. **Volume 4, Appendix 16.3 Section 14: Collision and Allision Risk Modelling** Provides quantification of collision and allision risk resulting from the CWP Project including accounting for weather conditions and assessment of whether machinery failure could cause vessels to be set into danger.

Issue	Compliance	Comments
		Volume 3, Chapter 16, Section 16.10: Impact Assessment The hazards due to the CWP Project have been assessed for each phase and include consideration of drifting allision risk.
Assessment of access to and navigation within, or close to, an OREI. To determine the extent to which navigation would be feasible within the OREI site itself by assessing whether:		
a. Navigation within or close to the site would be safe:		
i. For all vessels.	✓	**Volume 4, Appendix 16.3 Section 4: Consultation** Section 4.2 outlines Regular Operator consultation undertaken following the vessel traffic surveys. **Volume 4, Appendix 16.3 Section 14: Collision and Allision Risk Modelling** Provides quantification of collision and allision risk resulting from the CWP Project including accounting for weather and tidal conditions. **Volume 3, Chapter 16, Section 16.10: Impact Assessment** The hazards due to the CWP Project have been assessed for each phase and include consideration of internal allision risk. **Volume 3, Chapter 16, Section 16.10: Impact Assessment** The outputs of the quantitative modelling which accounts for metocean and tidal conditions have fed into assessment of risk from relevant hazards.
ii. For specified vessel types, operations and/ or sizes.		
iii. In all directions or areas.		
iv. In specified directions or areas.		
v. In specified tidal, weather or other conditions.		
b. Navigation in and/or near the site should be prohibited or restricted:		
i. For specified vessel types, operations and/ or sizes.	✓	**Volume 4, Appendix 16.3 Section 13: Navigation, Communication and Position Fixing Equipment** Assesses potential hazards on navigation of the different communications and position fixing
ii. In respect of specific activities.	✓	
iii. In all areas or directions.	✓	
iv. In specified areas or directions.	✓	

Issue	Compliance	Comments
v. In specified tidal or weather conditions.	✓	devices used in and around offshore wind farms. **Volume 4, Appendix 16.3 Section 12.3: Post Wind Farm** A methodology for post wind farm routeing is outlined and includes a minimum distance of 1 nm from offshore installations and existing offshore wind farm boundaries, i.e., it is assumed that commercial vessels will avoid the array site. **Volume 3, Chapter 16, Section 16.10: Impact Assessment** The hazards due to the CWP Project have been assessed for each phase and include consideration of vessel displacement.
c. Where it is not feasible for vessels to access or navigate through the site it could cause navigational, safety or routeing problems for vessels operating in the area, e.g., by preventing vessels from responding to calls for assistance from persons in distress.	✓	**Volume 3, Chapter 16, Section 16.10: Impact Assessment** The hazards due to the CWP Project have been assessed for each phase and include consideration of vessel displacement and emergency response capability.
d. Guidance on the calculation of safe distance of OREI boundaries from shipping routes has been considered.	✓	**Volume 4, Appendix 16.3 Section 12.3: Post Wind Farm** A methodology for post wind farm routeing is outlined and includes consideration of the Shipping Route Template.
Search and Rescue (SAR), maritime assistance service, counter pollution and salvage incident response.		
The MCA, through His Majesty's Coastguard, is required to provide SAR and emergency response within the sea area occupied by all OREIs in UK waters. To ensure that such operations can be safely and effectively conducted, certain requirements must be met by developers and operators.		
a. An Emergency Response Cooperation Plan (ERCoP) will be developed for the construction, operation and decommissioning phases of the OREI.	✓	**Volume 4, Appendix 16.3 Section 16: Mitigation Measures** Outlines the embedded mitigation measures to be implemented to reduce the significance of risk of shipping and navigation hazards including liaison with SAR resources to ensure suitable emergency plans

Issue	Compliance	Comments
		and procedures are in place which includes the provision of an ERCoP.
b. The MCA's guidance document Offshore Renewable Energy Installations: Requirements, Guidance and Operational Considerations for Search and Rescue and Emergency Response (MCA, 2021) for the design, equipment and operation requirements will be followed.	✓	**Volume 4, Appendix 16.3 Section 2: Guidance** Outlines the guidance used within the NRA including Annex 5 of MGN 654 and the IRCG equivalent (Standard Operating Procedure 07-2025 – Offshore Renewable Energy Installations: Guidance and Operational Considerations for SAR and Emergency Response) (DoT, 2025b). In line with this guidance a Safety Justification **(Appendix 16-A IRCG Safety Justification** of the **EIAR Addendum)** was submitted to IRCG on 2 December 2026 for both layouts. Following review the IRCG confirmed via a letter (**FIR Appendix D - Letter from IRCG r.e. Safety Justification**) on the 11 February 2026 that they were content that the relevant requirements had been met, subject to implementation of a number of commitments made in the Safety Justification.
c. A SAR checklist will be completed to record discussions regarding the requirements, recommendations and considerations outlined in Annex 5 (to be agreed with MCA).	✓	As per the Safety Justification (**Appendix 16-A IRCG Safety Justification** of the **EIAR Addendum)** a SAR checklist will be agreed with the IRCG post consent.
Hydrography. In order to establish a baseline, confirm the safe navigable depth, monitor seabed mobility and to identify underwater hazards, detailed and accurate hydrographic surveys are included or acknowledged for the following stages and to MCA specifications:		
i. Pre-construction: The proposed generating assets area and proposed cable route.	✓	The Applicant has committed to the required hydrographic surveys noting this was a comment raised by the MSO in their observation. Surveys will meet the requirements as stated in Annex III of the DoT Guidance on Safety of Navigation & Emergency Response: Offshore Renewable Energy Installations (DoT, 2025b).
ii. On a pre-established periodicity during the life of the development.	✓	
iii. Post construction: Cable route(s).	✓	
iv. Post decommissioning of all or part of the development: the installed generating assets area and cable route.	✓	

Issue	Compliance	Comments
Communications, Radar and positioning systems. To provide researched opinion of a generic and, where appropriate, site specific nature concerning whether:		
a. The structures could produce radio interference such as shadowing, reflections or phase changes, and emissions with respect to any frequencies used for marine positioning, navigation and timing (PNT) or communications, including Global Maritime Distress and Safety System (GMDSS) and AIS, whether ship borne, ashore or fitted to any of the proposed structures, to:		
i. Vessels operating at a safe navigational distance.	✓	**Volume 4, Appendix 16.3 Section 13: Navigation, Communication and Position Fixing Equipment** Assesses the potential risks associated with the use of navigation, communication and position fixing equipment due to the CWP Project including in relation to radio interference.
ii. Vessels by the nature of their work necessarily operating at less than the safe navigational distance to the OREI, e.g., support vessels, survey vessels, SAR assets.	✓	
iii. Vessels by the nature of their work necessarily operating within the OREI.	✓	
b. The structures could produce Radar reflections, blind spots, shadow areas or other adverse effects:		
i. Vessel to vessel.	✓	**Volume 4, Appendix 16.3 Section 13: Navigation, Communication and Position Fixing Equipment** Assesses the potential risks associated with the use of navigation, communication and position fixing equipment due to the CWP Project including in relation to marine Radar.
ii. Vessel to shore.	✓	
iii. VTS Radar to vessel.	✓	
iv. Racon to/ from vessel.	✓	
c. The structures and generators might produce SONAR interference affecting fishing, industrial or military systems used in the area.	✓	**Volume 4, Appendix 16.3 Section 13: Navigation, Communication and Position Fixing Equipment** Assesses the potential risks associated with the use of navigation, communication and position fixing equipment due to the CWP Project including in relation to SONAR.
d. The site might produce acoustic noise which could mask prescribed sound signals.	✓	**Volume 4, Appendix 16.3 Section 13: Navigation, Communication and Position Fixing Equipment** Assesses the potential risks associated with the use of navigation, communication and position fixing equipment due to the CWP Project including in relation to noise.
e. Generators and the seabed cabling within the site and onshore might produce Electromagnetic Fields (EMFs)	✓	**Volume 4, Appendix 16.3 Section 13: Navigation, Communication and Position Fixing Equipment**

Issue	Compliance	Comments
affecting compasses and other navigation systems.		Assesses the potential risks associated with the use of navigation, communication and position fixing equipment due to the CWP Project including in relation to electromagnetic interference.
Risk mitigation measures recommended for OREI during construction, operation and decommissioning.		
Mitigation and safety measures will be applied to the OREI development appropriate to the level and type of risk determined during the EIA. The specific measures to be employed will be selected in consultation with the MCA and will be listed in the developer's Environmental Statement. These will be consistent with international standards contained in, for example, SOLAS Chapter V (IMO, 1974), and could include any or all of the following:		
i. Promulgation of information and warnings through notices to mariners and other appropriate Maritime Safety Information (MSI) dissemination methods.	✓	**Volume 4, Appendix 16.3 Section 16: Mitigation Measures** Outlines the embedded mitigation measures to be implemented to reduce the significance of risk of shipping and navigation hazards including promulgation of information.
ii. Continuous watch by multi-channel Very High Frequency (VHF), including Digital Selective Calling (DSC).	✓	**Volume 4, Appendix 16.3 Section 16: Embedded Mitigation Measures** Outlines the embedded mitigation measures to be implemented to reduce the significance of risk of shipping and navigation hazards including marine coordination.
iii. Safety zones of appropriate configuration, extent and application to specified vessels.	✓	**Volume 4, Appendix 16.3 Section 16: Mitigation Measures** Outlines the embedded mitigation measures to be implemented to reduce the significance of risk of shipping and navigation hazards including advisory safe passing distances (noting that safety zones are not applicable in Ireland).
iv. Designation of the site as an Area to be Avoided (ATBA).	✓	There are no plans to designate the CWP Project as an ATBA.
v. Provision of aids to navigation as determined by the GLA.	✓	**Volume 4, Appendix 16.3 Section 16: Mitigation Measures** Outlines the embedded mitigation measures to be implemented to reduce the significance of risk of shipping and navigation hazards including lighting and marking in accordance with International Organization for Marine Aids to

Issue	Compliance	Comments
		Navigation (IALA) guidelines and in liaison Irish Lights.
vi. Implementation of routeing measures within or near to the development.	✓	There are no plans to implement any new routeing measures in proximity to the CWP Project.
vii. Monitoring by Radar, AIS, Closed Circuit Television (CCTV) or other agreed means.	✓	**Volume 3, Chapter 16 Section 16.14: Potential monitoring requirements** Outlines the approach to vessel traffic monitoring.
viii. Appropriate means for OREI operators to notify, and provide evidence of, the infringement of Safety Zones.	**N/A**	Safety zones are not applicable in Ireland.
ix. Creation of an ERCoP with the MCA's SAR Branch for the construction phase onwards.	✓	**Volume 4, Appendix 16.3 Section 16: Mitigation Measures** Outlines the embedded mitigation measures to be implemented to reduce the significance of risk of shipping and navigation hazards including liaison with SAR resources to ensure suitable emergency plans and procedures are in place which includes the provision of an ERCoP.
x. Use of guard vessels, where appropriate.	✓	**Volume 4, Appendix 16.3 Section 16: Mitigation Measures** Outlines the embedded mitigation measures to be implemented to reduce the significance of risk of shipping and navigation hazards including the use of guard vessels.
xi. Update NRAs every two years, e.g. at testing sites.	**N/A**	Not applicable to the CWP Project.
xii. Device-specific or array-specific NRAs.	✓	**Volume 4, Appendix 16.3 Section 6: Project Description Relevant to Shipping and Navigation** All offshore elements of the CWP Project have been considered in the NRA including all infrastructure (surface and subsea) within the array site and offshore export cable corridor.
xiii. Design of OREI structures to minimise risk to contacting vessels or craft.	✓	There is no additional risk posed to craft compared to previous offshore wind farms and so no additional measures are identified.

Issue	Compliance	Comments
xiv. Any other measures and procedures considered appropriate in consultation with other stakeholders.	✓	**Volume 4, Appendix 16.3 Section 16: Mitigation Measures** Outlines the embedded mitigation measures to be implemented to reduce the significance of risk of shipping and navigation hazards.

Table 2 MGN 654 Annex 1 Checklist

Item	Compliance	Comments
A risk claim is included that is supported by a reasoned argument and evidence.	✓	**Volume 3, Chapter 16, Section 16.10: Impact Assessment** The risk assessment provides a risk claim for a range of hazards based on a number of inputs including (but not limited to) baseline data, expert opinion, outputs of the Hazard Workshop, stakeholder concerns and lessons learnt from existing offshore developments.
Description of the marine environment.	✓	**Volume 4, Appendix 16.3 Section 7: Navigational Features** Relevant navigational features in proximity to the CWP Project have been described including (but not limited to) IMO routeing measures, ports, harbours and related facilities, charted anchorage areas, aids to navigation, subsea cables and pipelines, military PEXAs and charted wrecks. **Volume 4, Appendix 16.1: Cumulative Effects Assessment** Potential future developments have been screened in to the cumulative risk assessment where a cumulative or in combination activity has been identified based upon the location and distance from the CWP Project.

SAR overview and assessment.	✓	**Volume 4, Appendix 16.3 Section 9: Emergency Response Resources** Existing SAR resources in proximity to the CWP Project are summarised including the RNLI stations and assets and IRCG stations which respond to incidents requiring SAR. **Volume 3, Chapter 16, Section 16.10: Impact Assessment** The risk assessment includes an assessment of how activities associated with the CWP Project may restrict emergency response capability of existing resources – Section 19.
Description of the OREI development and how it changes the marine environment.	✓	**Volume 4, Appendix 16.3 Section 6: Project Description Relevant to Shipping and Navigation** The CWP Project boundary for which any shipping and navigation hazards are assessed is provided including a description of the array site and offshore export cable corridor infrastructure, construction phase programme and indicative vessel and helicopter numbers during the construction and operational phases. **Volume 4, Appendix 16.3 Section 12.3: Post Wind Farm** Alternative routeing for commercial traffic has been considered for the project option with the greatest significance of risk.
Analysis of the vessel traffic, including base case and future traffic densities and types.	✓	**Volume 4, Appendix 16.3 Section 12.3: Post Wind Farm** Vessel traffic data in proximity to the CWP Project has been analysed and includes vessel

		density and breakdowns of vessel type. **Volume 4, Appendix 16.3 Section 12.3: Post Wind Farm** Future vessel traffic levels have been considered, broken down as increases in commercial vessel activity, commercial fishing vessel and recreational vessel activity, and increases in traffic associated with project operations. Additionally, worst case alternative routeing for commercial traffic has been considered.
Status of the Hazard Log: • Hazard identification; • Risk assessment; • Influences on level of risk; • Tolerability of risk; and • Risk matrix.	✓	**Volume 4, Appendix 16.3 Section 3: Navigational Risk Assessment Methodology** A tolerability matrix has been defined to determine the tolerability (significance) of risks. **Volume 4, Appendix 16.3 Annex C: Hazard Log** The complete Hazard Log is presented and includes a description of the hazards considered, possible causes, consequences (most likely and worst case) and relevant embedded mitigation measures. Using this information, each hazard is then ranked in terms of frequency of occurrence and severity of consequence to give a tolerability (significance) level.
NRA: • Appropriate risk assessment; • MCA acceptance for assessment techniques and tools; • Demonstration of results; and • Limitations.	✓	**Volume 4, Appendix 16.3 Section 2: Guidance** MGN 654 and the IMO's Formal Safety Assessment (FSA) guidelines are the primary guidance documents used for the assessment. **Volume 4, Appendix 16.3 Section 14: Collision and Allision Risk Modelling** Provides quantification of collision and allision risk resulting from the

		with the results outlined numerically and graphically, where appropriate.
Risk control log	✓	**Volume 4, Appendix 16.3 Annex C: Hazard Log** The complete Hazard Log is presented and includes a description of the hazards considered, possible causes, consequences (most likely and worst case) and relevant embedded mitigation measures. Using this information, each hazard is then ranked in terms of frequency of occurrence and severity of consequence to give a tolerability (significance) level.

3 References

5. DoT (2025a). Guidance on Safety of Navigation & Emergency Response: Offshore Renewable Energy Installations.

6. DoT (2025b). Standard Operating Procedure 07-2025 – Offshore Renewable Energy Installations: Guidance and Operational Considerations for SAR and Emergency Response.

7. MCA (2021). MGN 654 (Merchant and Fishing) Safety of Navigation: Offshore Renewable Energy Installations (OREIs) – Guidance on UK Navigational Practice, Safety and Emergency Response.



codling wind park

FIR Response Document

Appendix F - Offshore and Intertidal Ornithology Cumulative Migratory Collision Risk Modelling

Environmental Impact Assessment Report

NISA

North Irish Sea Array

Volume 9: Appendices (Offshore)

Appendix 15.4
Offshore and Intertidal Ornithology Migratory Collision Risk Modelling

Statkraft

CIP Copenhagen Infrastructure Partners

GoBe APEM Group

ARUP

North Irish Sea Array Windfarm Ltd

Offshore Ornithology Migratory Collision Risk Modelling

North Irish Sea Array Offshore Wind Farm



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Acronyms

Term	Definition
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
GIS	Geographical Information System
JNCC	Joint Nature Conservation Committee
km	Kilometres
mCRM	Migratory collision risk model
MW	Megawatt
NPWS	National Parks and Wildlife Service
O&M	Operations and maintenance
RWE	RWE Renewables Ireland Ltd (a wholly owned subsidiary of RWE AG)
SPA	Special Protection Area
UK	United Kingdom
WTG	Wind turbine generator

1. Introduction

1.1 Project Background

1.1.1 This document has been prepared by Arup and GoBe Consultants Limited (GoBe) on behalf of North Irish Sea Array Limited (NISA Ltd) to accompany Volume 3, Chapter 15: Offshore and Intertidal Ornithology (hereafter referred to as the 'Offshore and Intertidal Ornithology Chapter').

1.1.2 The North Irish Sea Array Offshore Wind Farm (OWF) (hereafter the 'proposed development') is proposed for construction 11.3 km off the east coast of Ireland (at their nearest points to the mainland). The proposed development will consist of offshore wind turbines generators (WTG), an offshore substation platform (OSP), inter-array cables, export cables taking power to an onshore converter station. The area considered in the context of offshore ornithological receptors includes the entire array area, covering 89 km^2, an asymmetric 4 km buffer surrounding the array area, and the offshore Export Cable Corridor (ECC) covering a further 67.9 km^2.

1.1.3 During the breeding season, the Irish Sea region provides foraging, loafing and preening habitat for a range of seabirds, including (but not limited to) northern gannet, *Morus bassanus*, various gull species, and several species of auks and terns. An overview of key species that are present within and in close proximity to the proposed development is presented in Volume 9, Appendix 15.1: Offshore Ornithology Technical Baseline (hereafter referred to as the 'Technical Baseline').

1.2 Migratory Collision Risk Modelling

1.2.1 This technical appendix has been produced to support the EIAR Offshore Ornithology chapter (Volume 3, Chapter 15: Offshore Ornithology) and considers the potential impact to migratory birds that are not typically recorded in site specific monthly surveys due to their movements over a short period of time and often at night or during bad weather (Woodward *et al*., 2023; Wright *et al.,* 2012).

1.2.2 The Irish Sea is subject to pronounced passages of birds travelling to and from the UK, Europe and further afield (Stienen *et al*., 2007). This includes the migratory movements of non-seabirds such as waders, wildfowl, passerines and non-passerines. Due to the mix of birds present, the NISA array area is used at different times of the year by birds (i) overwintering in the area; (ii) foraging from nearby breeding coastal colonies; and (iii) on Autumn migration (post-breeding dispersal), and Spring migration (return).

1.2.3 Assessing the potential impact from collision risk with WTGs is an essential part of the EIA assessment process. The level of risk from collisions with turbines is estimated using Collision Risk Modelling (CRM). The species that are unlikely to be impacted are screened out and excluded from the modelling.

1.2.4 Site specific digital aerial surveys (DAS) were conducted for the Maritime Area Consent (MAC) +4km buffer. The results provide information for key seabird species abundance throughout the year but are limited when it comes to migratory species, particularly non-seabirds. This is due to the snapshot nature of baseline surveys which has the potential to miss some species moving through in short pulses, in poor weather or at night (when no surveys take place), or at high altitudes, which makes recording their numbers extremely complex using standard methods.

1.2.5 To model the movements of migratory birds for the proposed development the Marine Scotland Avian Migration Collision Risk Model Shiny Application ("mCRM App"; HiDef Aerial Surveying Ltd., 2024[1]) was used.

1.2.6 The mCRM App is not suitable for the modelling of all species, particularly species that do not follow a point-to-point migration pattern (Alerstam, 1990). Some species take longer routes to follow the coastline in preference to a direct route over land. The analysis of these species can be carried out using the 'broad front' pathway method, which better describes the species' movement within western waters. The risk to the population caused by the presence of the Project, relates to the proportion of the 'broad front' pathway crossing the Project array area. Further details are provided in Section 3.

1.2.7 There is potential risk to migratory birds flying through NISA to collide with the wind turbines and associated infrastructure. Collision risk is higher if turbines are located in areas where bird densities are high and where there is a high level of flight activity. Areas with a high density of flying birds may be associated with locations of concentrated food availability, or where there is a high turnover of individuals (possibly commuting daily between nesting and feeding areas or passing through the area on seasonal migrations). The potential collision risk to each species can be estimated throughout the year by using collision risk modelling (CRM).

1.2.8 Broad front modelling for migratory seabirds was not used in this assessment as the main migratory seabird species were covered in the main CRM analysis and/or the relevant species were recorded in low numbers in the array area during the DAS surveys (Appendix 15.2: Offshore and Intertidal Ornithology Collision Risk Modelling Assessment).

[1] Available at: https://hidefdevo.shinyapps.io/mCRM/ [Accessed March 2024].

2. Species selection and screening process

2.1 Screening methodology

2.1.1 Migratory tern, gull and waterbird species have been screened in for the assessment of operational phase to assess the potential impact from collision during migration for the regional populations and from specific Special Protection Areas (SPAs), which were determined in using a quantitative screening methodology outlined in 'Supporting Information: Screening for Appropriate Assessment (SISAA)'.

2.1.2 In order to screen-in relevant SPAs to the project array, a quantifiable approach was used that captured the percentage of bird migration pathways that could intersect with the project array boundary. All geometry and data manipulation functions utilised within this method were carried out within the software QGIS 3.34.

2.1.3 United Kingdom (UK) and Republic of Ireland (ROI) SPA boundary data was obtained from relevant sources (JNCC and NPWS). A centroid value was then calculated for each SPA, by using the geometry tool "Centroids". This algorithm creates a new point layer that represents the centroid of the geometrics of an input layer. The coastlines of Continental Europe and Iceland were split into 1km points, with each point being labelled with a unique ID, to capture representative southern and northern bird migratory endpoints.

2.1.4 Using the "MMQGIS Hub Lines tool", each point along these coastlines were joined to the centre of each SPA. For each SPA this created a unique vector layer of lines from the SPA to each individual endpoint that represented all possible migratory pathways. Using the geoprocessing tool "Intersection" the number of lines, from each SPA to the north and south endpoints, that directly passed through the project array area could be counted. The "Intersection" algorithm extracts the overlapping proportions of features in an input layer (SPA lines shapefile) that overlap with an overlay layer (project array boundary). This process was done for each individual SPA.

2.1.5 Each individual SPA intersection was then combined into a single output by utilising the processing toolbox function "Merge vector layers". The "Statistics by categories" function was then used to create an exportable attributes table containing a list of all SPAs that intersected with the array area, and the number of lines to do so. SPAs that had no lines intersecting with the project array area were screened out at this point.

2.1.6 Utilising the number of northern (7311) and southern (7110) migratory endpoints, a percentage of lines intersecting, for each relevant SPA, with the project array area could then be calculated from the exported attributes table. In order for relevant SPAs to be included within following assessments, only those with migratory features with at least 10% of lines intersecting with the project array were carried forward. SPAs with a lower percentage of intersections passing through the project array area were screened out because bird migrations from these SPAs are likely to result in negligible numbers passing through the site, and any associated collisions would be minimal.

2.1.7 The standard threshold used for screening in migratory bird species was if at least 1% of the Irish population is expected to pass through the footprint of the array area each year. Species can also be screened in if there is evidence of increased risk of collision at the site/in the area. This assessment is to identify the potential interaction of migratory species passing through NISA and not species that are in the area for long periods of time. This has been assessed in Section 17. The screening in process is summarised in the flowchart below (Figure 2-1)

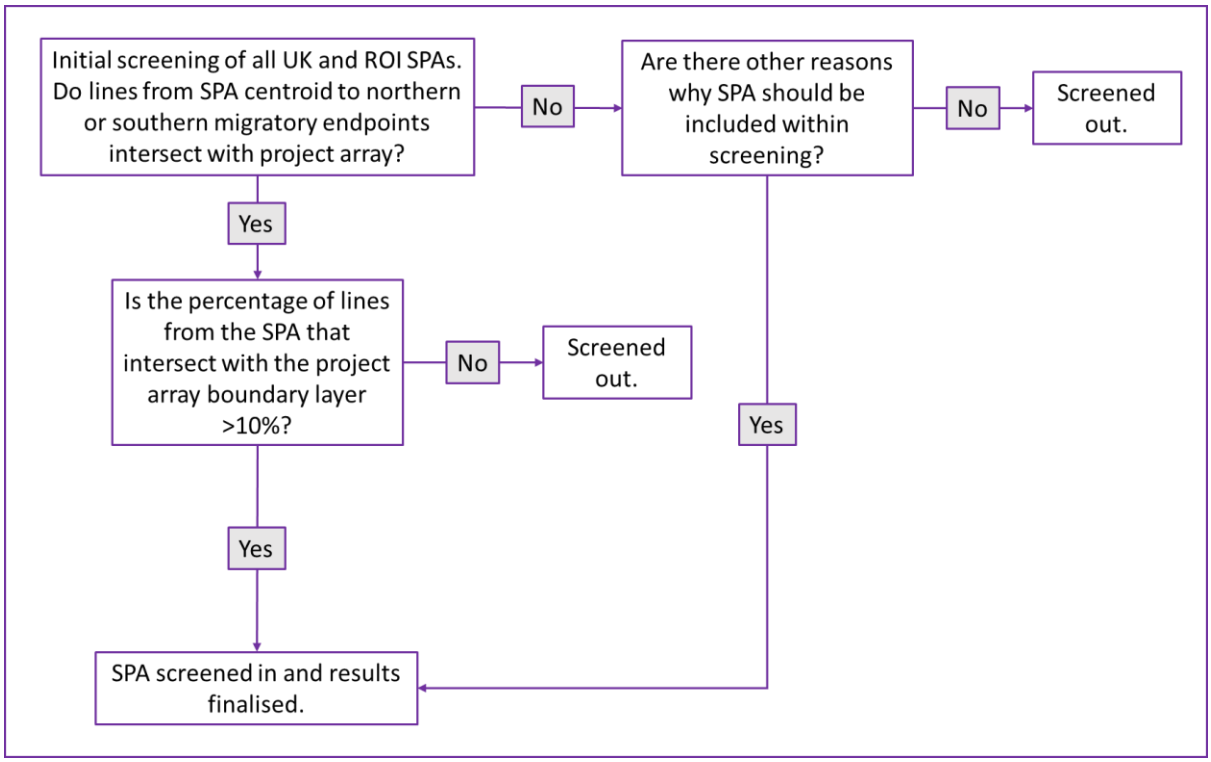


Figure 2-1 Flowchart illustrating the approach to screening for mCRM.

2.1.8 The initial screening was carried out to consider the migratory species designated to sites with >10% of migratory flight lines intersecting with the proposed array area. These are presented in Table 2.1.

2.1.9 The migratory species that are suitable for mCRM analysis were included in the assessment and the results are displayed in

2.1.11 Table 2.2. The species that have <1% proportion of the All-Ireland population at risk of collision within proposed development array area were screened out at this stage.

Table 2.1: SPAs designated for migratory birds relevant to the Project (>10% intersecting migratory flight lines).

Designated site	Distance to Array (km)	Features screened in for collision risk
Rockabill SPA	0.2	Purple sandpiper (*Calidris maritima*)
Skerries Islands SPA	9.3	Light-bellied brent goose (*Branta bernicla horta*), purple sandpiper, turnstone (*Arenaria interpres*)
Rogerstown Estuary SPA	15.6	Light-bellied brent goose, greylag goose (*Anser anser*), shelduck (*Tadorna tadorna*), shoveler (*Spatula clypeata*), oystercatcher (*Haematopus ostralegus*), ringed plover (*Charadrius hiaticula*), grey plover (*Pluvialis squatarola)*, knot (*Calidris canutus*), dunlin (*Calidris alpina*), black-tailed godwit (*Limosa limosa*), redshank (*Tringa totanus*)
Boyne Estuary SPA	16.2	Shelduck, oystercatcher, golden plover (*Pluvialis apricaria)*, grey plover, lapwing (*Vanellus vanellus*), knot, sanderling (*Calidris alba*), black-tailed godwit, redshank, turnstone
River Nanny Estuary and Shore SPA	16.9	Oystercatcher, ringed plover, golden plover, knot, sanderling
Malahide Estuary SPA	21.7	Great crested grebe (*Podiceps cristatus*), light-bellied brent goose, shelduck, pintail (*Anas acuta*), goldeneye (*Bucephala clangula*) , red-breasted merganser (*Mergus serrator*), oystercatcher, golden plover, grey plover, knot, dunlin, black-tailed godwit, bar-tailed godwit (*Limosa lapponica*), redshank
Baldoyle Bay SPA	26.4	Light-bellied brent goose, shelduck, ringed plover, golden plover, grey plover, bar-tailed godwit
Poulaphouca Reservoir SPA	61.5	Greylag goose
Blackwater Callows SPA	202.5	Bewick's swan (*Cygnus columbianus*), wigeon (*Anas Penelope*), teal (*Anas crecca*), mallard (*Anas platyrhynchos)*, shoveler, black-tailed godwit, lapwing, curlew (*Numenius Arquata*)
Cork Harbour SPA	243.6	Shelduck, wigeon, teal, mallard, pintail, shoveler, red-breasted merganser, great crested grebe, oystercatcher, black-tailed godwit, bar-tailed godwit, redshank, golden plover, grey plover, lapwing, dunlin, curlew
Courtmacsherry Bay SPA	286.5	Shelduck, wigeon, red-breasted merganser, black-tailed godwit, bar-tailed godwit, golden plover, lapwing, dunlin, curlew
Clonakilty Bay SPA	298.7	Shelduck, black-tailed godwit, curlew, dunlin

Table 2.2: Species screened in for assessment and modelling approach

mCRM tool		
Light-bellied brent goose	Greylag goose	Bewick's swan
Shelduck	Shoveler	Wigeon
Mallard	Pintail	Teal
Goldeneye	Red-breasted merganser	Great crested grebe
Oystercatcher	Lapwing	Golden plover
Grey plover	Ringed plover	Curlew
Bar-tailed godwit	Black-tailed godwit	Turnstone
Knot	Sanderling	Dunlin
Purple sandpiper	Redshank	

2.1.12 Species that are not prone to collision or have been recorded in negligible numbers within the array area have been screened out. Rationale behind these decisions can be found in the screening report (Supporting Information: Screening for Appropriate Assessment (SISAA)).

3. mCRM

3.1 mCRM methodology

3.1.1 There is potential for migratory birds to be subjected to collision risk mortalities whilst on seasonal migrations through the Project array area. The potential collision risk can be estimated using collision risk modelling (CRM).

3.1.2 The mCRM was undertaken using the Marine Scotland Avian Migration Collision Risk Model Shiny Application ("mCRM App"; HiDef Aerial Surveying Ltd., 2024). The mCRM shiny application is a stochastic adaptation of the Band (2012) migration collision risk worksheet. The mCRM was accessed via the 'Shiny App' interface, which is a user-friendly graphical interface accessible via a standard web-browser or within R statistical software (R Core Team, 2021) that uses an R code to estimate migratory collision risk (Donovan 2018). For this assessment the latest version of the model was downloaded and run locally within R (v0.4.1). The advantage of the mCRM over the Band (2012) model is that it provides a clear and transparent audit trail for all modelling runs, which enables regulators to easily access and reproduce the results of any modelling scenario.

3.1.3 The mCRM tool provides two functions:

- Creates population estimates in wind farms by sampling migratory pathways via straight lines drawn between Ireland and non-UK countries; and
- Runs a stochastic version of the migratory collision risk model based on the population estimates and use-input parameters.

3.2 mCRM inputs

Turbine parameters

3.2.1 A GIS shapefile of the OWF footprint was added to the mCRM shiny application. The OWF and turbine parameters used in the mCRM are presented in Table 3.1 and Table 3.2. These values are based on the project option with the greatest potential for a likely significant effect for WTG 1 & 2, as described in Chapter 15 - Offshore Ornithology. A 'Large Array Correction' factor was applied to the mCRM.

Table 3.1:Turbine parameters used for the two project options in all CRM scenarios.

Parameter	WTG 1	WTG 2
No. WTGs	49	35
Latitude (°N)	53.7	53.7
Width of array (km)	17.8	17.8
Tidal offset (m)	2.71	2.71
No. Blades	3	3
Rotor radius (m)	125	138
Max Chord (m)	7	7.5
Average RPM	8.3 (SD 1.45)	7.5 (SD 1.45)
Average Pitch (°)	5.6 (SD 0.5)	5.6 (SD 0.5)
Tip Clearance HAT (m)	34.44	A = 34.44, B = 29.44

Table 3.2: Predicted mean wind availability and downtime for all CRM scenarios.

Parameter	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Wind availability (%)	95.7	95.7	95.7	95.7	95.7	93	93	93	95.7	95.7	95.7	95.7
Mean downtime (%)	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3

Bird parameters

3.2.2 The species population estimates and proportion of birds at risk of collision provided within the mCRM tool defaults to the UK population sizes, which are not representative of Irish populations. To make it applicable to an OWF in the Irish Sea the defined populations in the tool were altered to reflect a truer representation of the migratory pathways within the region of the array area. To determine appropriate populations and proportions passing the Irish Sea several methods were used, the Irish population used was taken from Burke *et al.* (2018) and for species with an easterly migration pathway to and from Ireland (e.g. Bewick's swan) the population was set at the Irish population in Burke *et al.* (2018) For species with a northerly or north-westerly migratory route to and from Ireland (e.g. light-bellied brent goose) a precautionary measure was used by adding 25% of the UK population (found in the Shiny App) to the Irish population to include any individuals from the south-western regions of the UK populations overflying the Irish Sea. If the Irish population plus the 25% of the UK population exceeded the flyway population, then the proportion of the population passing through the proposed development was set to one. Where the all Ireland populations were not provided in Burke *et al.* (2018), the default UK populations in the Shiny App were used with the following caveats applied. For migratory raptor species and snipe it was assumed that a conservative 50% of the UK population may fly over the Irish Sea during the migration period and for corncrake, which migrates north/south from its breeding range in the north-west of the UK that a precautionary 100% of the UK population was assumed to fly over the Irish Sea. The proportion of birds passing through the wind farm footprint was adjusted to include the calculated Irish populations. Where Irish populations plus the additional 25% of the UK population exceeded the flyway population, the total proportion of birds passing through the wind farm footprint was set to 1. The species population estimates and proportion of birds at risk of collision from the proposed development (for WTG 1 & 2) that were calculated and used in the mCRM tool are present in Table 3.3 and Table 3.4.

3.2.3 The defined pre-breeding and post-breeding migration seasons used for mCRM are defined in Table 3.5. The species-specific biometric parameters used within mCRM are presented in Table 3.6. The parameters are preloaded using the mCRM tool which collates biometric information including Robinson (2017). Each flight type was set as "flapping".

Table 3.3: The population estimates passing through the windfarm and the proportion of birds at risk of collision for the assessed species for Project Option 1.

Species	Population estimate	SD	% at collision risk	Screened in/out
Bar-tailed godwit	47	18	0.3	Out
Bewick's swan	1	0	5.0	In
Black-tailed godwit	2228	321	2.3	In
Curlew	873	161	1.2	In
Dunlin	7208	1414	1.3	In
Golden plover	10757	2280	1.2	In
Goldeneye	204	37	1.5	In
Great crested grebe	72	11	2.4	In
Grey plover	40	8	1.3	In
Greylag goose	0	0	0	Out
Knot	1307	290	1.2	In
Lapwing	1284	227	1.5	In
Light-bellied brent goose	821	111	2.2	In
Mallard	377	71	1.3	In
Oystercatcher	2400	396	1.6	In
Pintail	93	20	1.4	In
Purple Sandpiper	101	17	1.5	In
Red-breasted merganser	94	17	1.5	In
Redshank	1837	336	1.4	In
Ringed plover	589	121	1.1	In
Sanderling	657	140	1.1	In
Shelduck	130	24	1.3	In
Shoveler	35	6	1.5	In
Teal	1639	344	1.1	In
Turnstone	1121	252	1.2	In
Wigeon	2061	407	1.2	In

Table 3.4: The population estimates passing through the windfarm and the proportion of birds at risk of collision for the assessed species for Project Option 2.

Species	Population estimate	SD	% at collision risk	Screened in/out
Bar-tailed godwit	47	19	0.3	Out
Bewick's swan	1	0	5.0	In
Black-tailed godwit	2224	330	2.3	In
Curlew	871	157	1.2	In
Dunlin	7180	1362	1.3	In
Golden plover	10780	2231	1.2	In
Goldeneye	204	38	1.5	In
Great crested grebe	72	11	2.4	In
Grey plover	40	8	1.3	In
Greylag goose	0	0	0	Out
Knot	1308	261	1.2	In
Lapwing	1283	203	1.5	In
Light-bellied brent goose	820	120	2.2	In
Mallard	377	75	1.3	In
Oystercatcher	2407	409	1.6	In
Pintail	93	19	1.4	In
Purple Sandpiper	101	20	1.5	In
Red-breasted merganser	94	18	1.5	In
Redshank	1837	381	1.4	In
Ringed plover	588	119	1.1	In
Sanderling	659	141	1.1	In
Shelduck	129	27	1.3	In
Shoveler	35	7	1.5	In
Teal	1634	368	1.1	In
Turnstone	1122	248	1.2	In
Wigeon	2069	412	1.2	In

Table 3.5: Defined migration seasons used in the mCRM tool.

Species	Pre-breeding	Post-breeding	Other
Bar-tailed godwit	Mar - Apr	Jul - Oct	-
Bewick's swan	Feb - Mar	Oct - Dec	-
Black-tailed godwit	Mar - May	Aug - Oct	-
Curlew	Mar - May	Jun - Oct	-
Dunlin	Mar - May	Jun - Oct	-
Golden plover	Feb - May	Jul - Oct	-
Goldeneye	Feb - May	Aug - Dec	-
Great crested grebe	Mar - Jun	Jul - Nov	Feb - Mar
Grey plover	Mar - May	Jul - Sep	-
Greylag goose	Mar - Apr	Oct - Nov	-
Knot	Feb - May	Jun - Oct	-
Lapwing	Jan - May	Oct - Nov	-
Light-bellied brent goose	Mar - May	Aug - Oct	-
Mallard	Apr - Jun	Sep - Oct	Jan - Mar
Oystercatcher	Jan - Mar	Jul - Nov	-
Pintail	Mar - May	Aug - Nov	-
Purple Sandpiper	Mar - May	Jul - Nov	-
Red-breasted merganser	Apr - Jul	Aug - Nov	-
Redshank	Mar - May	Jul - Sep	-
Ringed plover	Mar - May	Aug - Oct	-
Sanderling	Apr - Jun	Jul - Oct	-
Shelduck	Jan - Feb	Jun - Jul	Aug - Dec
Shoveler	Mar - Jun	Jul - Aug	Sep - Dec
Teal	Feb - May	Jul - Dec	-
Turnstone	Jan - Jun	Jul - Aug	-
Wigeon	Mar - Apr	Aug - Nov	-

Table 3.6: Species biometrics used in the mCRM tool. Standard deviation (SD) included in brackets.

Species	Body length (m)	Wingspan (m)	Flight speed (ms^{-1})	Proportion at PCH (%)	Avoidance Rate
Bar-tailed godwit	0.38 (0.02)	0.75 (0.02)	18.3 (2.1)	1.0	0.999 (0.0000)
Bewick's swan	1.21 (0.04)	1.96 (0.04)	24.0 (7.6)	0.5	0.988 (0.0009)
Black-tailed godwit	0.42 (0.02)	0.76 (0.02)	18.1 (6.0)	1.0	0.999 (0.00003)
Curlew	0.55 (0.02)	0.90 (0.03)	15.4 (3.3)	1.0	0.999 (0.0000)
Dunlin	0.18 (0.01)	0.40 (0.01)	15.3 (1.9)	1.0	0.999 (0.0000)
Golden plover	0.28 (0.01)	0.72 (0.01)	16.5 (1.8)	1.0	0.999 (0.0000)
Goldeneye	0.46 (0.01)	0.72 (0.01)	20.3 (3.8)	1.0	0.985 (0.0008)
Great crested grebe	0.48 (0.02)	0.88 (0.02)	21.1 (1.6)	1.0	0.995 (0.00001)
Grey plover	0.28 (0.01)	0.77 (0.01)	16.5 (1.8)	1.0	0.999 (0.0000)
Greylag goose	0.82 (0.03)	1.64 (0.03)	12.0 (4.9)	0.5	0.9996 (0.0000)
Knot	0.24 (0.01)	0.59 (0.01)	24.6 (3.3)	1.0	0.999 (0.0000)
Lapwing	0.30 (0.01)	0.84 (0.01)	12.8 (1.3)	1.0	0.999 (0.0000)
Light-bellied brent goose	0.58 (0.02)	1.15 (0.02)	17.9 (6.1)	0.5	0.999 (0.0001)
Mallard	0.58 (0.02)	0.90 (0.02)	15.9 (2.0)	1.0	0.985 (0.0008)
Oystercatcher	0.42 (0.02)	0.83 (0.02)	13.0 (2.5)	1.0	0.999 (0.0000)
Pintail	0.58 (0.02)	0.88 (0.02)	21.9 (2.0)	1.0	0.985 (0.0008)
Purple Sandpiper	0.21 (0.01)	0.44 (0.01)	15.3 (1.9)	1.0	0.999 (0.0000)
Red-breasted merganser	0.55 (0.01)	0.78 (0.01)	22.0 (2.9)	1.0	0.985 (0.0008)
Redshank	0.28 (0.01)	0.62 (0.01)	15.3 (4.1)	1.0	0.999 (0.0000)
Ringed plover	0.19 (0.01)	0.52 (0.01)	16.0 (1.1)	1.0	0.999 (0.0000)
Sanderling	0.20 (0.01)	0.42 (0.01)	21.4 (1.1)	1.0	0.999 (0.0000)
Shelduck	0.62 (0.02)	1.12 (0.02)	18.2 (4.3)	0.5	0.985 (0.0008)
Shoveler	0.48 (0.02)	0.77 (0.02)	18.3 (2.0)	1.0	0.985 (0.0008)
Teal	0.36 (0.015)	0.61 (0.015)	17.4 (1.6)	1.0	0.985 (0.0008)
Turnstone	0.23 (0.01)	0.54 (0.01)	10.0 (3.3)	1.0	0.999 (0.0000)
Wigeon	0.48 (0.02)	0.80 (0.02)	18.5 (2.0)	1.0	0.985 (0.0008)

Avoidance rates

3.2.4 Avoidance rates (AR) are a key parameter in the mCRM, they take into consideration that birds will undertake avoidance behaviour in response to the presence of a windfarm to prevent collision. This can occur at three scales (Cook *et al*., 2014); micro-avoidance (avoiding individual turbine blades); meso-avoidance (avoiding whole wind turbines, not just the rotor-swept area) and macro-avoidance (avoiding the whole wind farm array area and buffer). This adjustment is required since baseline survey data are collected before turbines are present. The AR used in CRM for each species, presented in Table 3.6, are set in the mCRM tool as recommended by NatureScot and checked by Cook (pers comm). The AR used in the tool are based upon the most recent evidence (Cook, 2014).

Species biometrics

3.2.5 The species-specific biometric input parameters used in the mCRM are provided in Table 3.6. The biometrics for all species (body length and wingspan) were taken as presented in Natural England's most recent guidance (Natural England, 2022), which are derived from the biometric data from Snow and Perrins (1998).

Seabird flight speeds

3.2.6 Species-specific flight speeds used in the mCRM assessment are presented in Table 3.6. Flight speeds were taken from Pennycuick (1997) for gannet and Alerstam *et al*. (2007) for all other species, as per the latest interim guidance from Natural England (Natural England, 2022).

4.1.1 This section presents the outputs from the CRM analysis for each of the migratory species. A summary of the results for each species (for WTG 1 & 2) is presented in Table 4.1 and Table 4.2.

Table 4.1: Summary of annual collision estimates following the project approach for WTG1.

WTG 1				
Species	Pre-breeding	Post-breeding	Other	Total
Bewick's swan	0 ± 0	0 ± 0	-	0 ± 0
Black-tailed godwit	0.054 ± 0.012	0.053 ± 0.011	-	0.107 ± 0.016
Curlew	0.023 ± 0.005	0.023 ± 0.005	-	0.046 ± 0.007
Dunlin	0.149 ± 0.029	0.147 ± 0.029	-	0.296 ± 0.041
Golden plover	0.238 ± 0.051	0.235 ± 0.050	-	0.473 ± 0.071
Goldeneye	0.071 ± 0.014	0.070 ± 0.014	-	0.141 ± 0.020
Great crested grebe	0.008 ± 0.001	0.008 ± 0.001	0.008 ± 0.001	0.024 ± 0.002
Grey plover	0.001 ± 0	0.001 ± 0	-	0.002 ± 0
Knot	0.027 ± 0.006	0.027 ± 0.006	-	0.054 ± 0.008
Lapwing	0.03 ± 0.005	0.03 ± 0.005	-	0.06 ± 0.007
Light-bellied brent goose	0.011 ± 0.005	0.011 ± 0.005	-	0.022 ± 0.007
Mallard	0.145 ± 0.03	0.146 ± 0.03	0.146 ± 0.03	0.437 ± 0.052
Oystercatcher	0.061 ± 0.011	0.06 ± 0.011	-	0.121 ± 0.016
Pintail	0.033 ± 0.007	0.033 ± 0.007	-	0.066 ± 0.01
Purple Sandpiper	0.002 ± 0	0.002 ± 0	-	0.004 ± 0
Red-breasted merganser	0.033 ± 0.006	0.033 ± 0.006	-	0.066 ± 0.008
Redshank	0.042 ± 0.008	0.041 ± 0.008	-	0.083 ± 0.011
Ringed plover	0.012 ± 0.003	0.012 ± 0.002	-	0.024 ± 0.004
Sanderling	0.013 ± 0.003	0.013 ± 0.003	-	0.026 ± 0.004
Shelduck	0.025 ± 0.005	0.025 ± 0.005	0.025 ± 0.005	0.075 ± 0.009
Shoveler	0.012 ± 0.002	0.012 ± 0.002	0.012 ± 0.002	0.036 ± 0.003
Teal	0.554 ± 0.12	0.549 ± 0.119	-	1.103 ± 0.169
Turnstone	0.028 ± 0.009	0.027 ± 0.009	-	0.055 ± 0.013
Wigeon	0.735 ± 0.152	0.73 ± 0.151	-	1.465 ± 0.214

Table 4.2: Summary of annual collision estimates following the project approach for WTG2.

WTG 2				
Species	Pre-breeding	Post-breeding	Other	Total
Bewick's swan	0 ± 0	0 ± 0	-	0 ± 0
Black-tailed godwit	0.04 ± 0.009	0.04 ± 0.009	-	0.08 ± 0.013
Curlew	0.017 ± 0.003	0.017 ± 0.003	-	0.034 ± 0.004
Dunlin	0.113 ± 0.021	0.111 ± 0.021	-	0.224 ± 0.03
Golden plover	0.18 ± 0.037	0.178 ± 0.037	-	0.358 ± 0.052
Goldeneye	0.053 ± 0.011	0.053 ± 0.011	-	0.106 ± 0.016
Great crested grebe	0.006 ± 0.001	0.006 ± 0.001	0.006 ± 0.001	0.018 ± 0.002
Grey plover	0.001 ± 0	0.001 ± 0	-	0.002 ± 0
Knot	0.021 ± 0.004	0.02 ± 0.004	-	0.041 ± 0.006

Lapwing	0.023 ± 0.004	0.023 ± 0.004	-	0.046 ± 0.006
Light-bellied brent goose	0.008 ± 0.004	0.008 ± 0.004	-	0.016 ± 0.006
Mallard	0.108 ± 0.023	0.109 ± 0.023	0.109 ± 0.023	0.326 ± 0.04
Oystercatcher	0.046 ± 0.009	0.045 ± 0.008	-	0.091 ± 0.012
Pintail	0.025 ± 0.005	0.025 ± 0.005	-	0.05 ± 0.007
Purple Sandpiper	0.002 ± 0	0.002 ± 0	-	0.004 ± 0
Red-breasted merganser	0.025 ± 0.005	0.025 ± 0.005	-	0.05 ± 0.007
Redshank	0.031 ± 0.007	0.031 ± 0.007	-	0.062 ± 0.01
Ringed plover	0.009 ± 0.002	0.009 ± 0.002	-	0.018 ± 0.003
Sanderling	0.01 ± 0.002	0.01 ± 0.002	-	0.02 ± 0.003
Shelduck	0.019 ± 0.004	0.018 ± 0.004	0.019 ± 0.004	0.056 ± 0.007
Shoveler	0.009 ± 0.002	0.009 ± 0.002	0.009 ± 0.002	0.027 ± 0.003
Teal	0.416 ± 0.096	0.413 ± 0.095	-	0.829 ± 0.135
Turnstone	0.021 ± 0.007	0.02 ± 0.006	-	0.041 ± 0.009
Wigeon	0.555 ± 0.116	0.551 ± 0.115	-	1.106 ± 0.163

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GoBe Consultants Ltd
Suites B2 & C2, Higher Mill
Higher Mill Lane
Buckfastleigh
Devon
TQ11 0EN

www.gobeconsultants.com

GoBe Consultants Ltd
5/2 Merchant's House
7 West George Street
Glasgow
Scotland
G2 1BA

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Appendix G – Utility of Radar


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Abbreviations

Abbreviation	Term in Full
ACP	An Coimisiún Pleanála
CWP	Codling Wind Park
DAS	Digital Aerial Survey
EIAR	Environmental Impact Assessment Report
FIR	Further Information Request
GPS	Global Positioning System
SPA	Special Protected Area

1 Introduction

1. Codling Wind Park Limited (hereafter 'the Applicant') is proposing to develop the Codling Wind Park (CWP) Project, which is located in the Irish sea approximately 13 - 22 km off the east coast of Ireland, at County Wicklow.

2. This appendix forms part of the Applicant's response to Item 7b in the **FIR Response Document** and supports **Section 10** of the **EIAR Addendum**. Specifically, this appendix presents a detailed rationale as to the efficacy of radar as a proposed means of providing baseline information on migratory birds within the array site.

3. In FIR item 7b, ACP stated that, "*The applicant is requested to address the purported data gap relating to migratory birds to enable the assessment of potential impacts of the proposed development. Radar (horizontal and vertical surveys) (or similar) at the array site during peak migration periods should be utilised to provide site-specific data, which could be used to support the applicant's current assessment and provide quantitative information on passage of birds to feed into collision modelling. Should radar surveys not be conducted and an alternative survey methodology utilised, comprehensive justification for the alternative should be provided*".

4. This appendix provides justification as to the non-utilisation of radar and the use of published empirical data as a more robust means of informing the migratory baseline within the array site and impact assessment. **Appendix 10-B** of the EAIR Addendum provides further information on the alternative data sources utilised to inform the assessment, with justification also provided within the FIR response document.

2 An assessment of radar as a method for characterising migratory baseline conditions on a site-only level

5. The "*purported data gap*" identified by ACP (FIR item 7b) relates to a perceived lack of site-specific empirical data. The Applicant has addressed this point by providing justification of the robustness of the original assessment method (i.e. the use of published empirical data) (see **Section 3.7.2** of the **FIR response document**), and further empirical site-specific data validating the existing characterisation (See **Appendix 10-B** of the EIAR Addendum). This document provides justification of the unsuitability of radar in characterising migratory activity within the array site.

6. Beyond the justification presented in **Section 3.7.2** of the **FIR response document,** it is relevant to note that there are several guidance documents which have informed the Applicant's approach to the characterisation of the receiving environment, which includes the characterisation of the migratory bird assemblage.

7. The characterisation of ornithological baseline conditions presented in EIAR **Appendix 10.5 Baseline characterisation report**, in the marine environment, is underpinned by the Irish Government's requirements for Marine Baseline Ecological Assessment[1], which emphasises that a comprehensive desk-based review of existing data, identification of relevant designated sites, and robust site-specific surveys (typically DAS or boat-based) be used to determine the occurrence, abundance, seasonality and spatial use of a given area by birds, is the preferred approach. These data feed into statutory impact assessment processes, including collision risk, displacement and connectivity analyses.

[1] Guidance on Marine Baseline Assessments and Monitoring Activities for Offshore Renewable Energy Projects - PART II. Available at: f957f02d-guidance-on-marine-baseline-ecological-assessments-monitoring-activities-for-.pdf

8. It is also noted in Part II of the Guidance on Marine Baseline Ecological Assessments and Monitoring Activities (DCCAE, 2016) that, "*Remote Monitoring Techniques can be used to compliment baseline surveys and can provide additional ornithological understanding on the use of a site in both a regional and national/international context. Such techniques include radar (land, platform, boat and shore based), thermal cameras and night vision, and tagging techniques (radio, satellite, GPS and satellite GPS).*" Notwithstanding the methodological limitations of this technique, it is evident that the guidance indicates that the use of radar would be additional and complimentary at best.

9. Furthermore, Walls et al. (2009) (which is also cited by DCCAE, 2016) states that, although radar can be used to quantify flight activity, this technique not only has technological and practical limitations, but it is complimentary (rather than fundamental) to baseline monitoring. This report recommends the use of radar as part of a strategic, integrated monitoring process and provides a very clear recommended approach as to the use of radar for the monitoring of flight activity for both pre-and post-construction monitoring as part of a broader, integrated survey strategy (rather than as a standalone tool for baseline characterisation). Pre-construction monitoring using RADAR is logistically problematic due to lack of existing infrastructure at sea, so is likely to be expensive. Ship-based RADAR can be deployed, however the data quality is poor in comparison to platform and land-based RADAR monitoring. In all cases at-sea RADAR is susceptible to atmospheric clutter and it cannot distinguish between species. There may be some utility in the use of RADAR in detecting migratory pulses on a complimentary basis to the traditional baseline characterisation methods, however such data could be procured through monitoring of e.g. I-WeBS site along the Irish east coast or through the Dublin Bay birds project to detect when migration movements are taking place within the region.

10. Similarly, the Irish Environmental Protection Agency EPA guidance on EIA (EPA 2022 Guidelines) notes that *Baseline information should, in the first instance, be sourced from published references to ensure reliability and objectivity. […]*, and that data and information should be *sufficiently accurate to provide a reliable reference against which effects can be assessed*; using peer reviewed published data across a flyway for characterisation and assessment purposes should in this context be seen as a reliable reference, when compared to spatially limited radar which may not be representative of broader flyways. CIEEM guidance similarly stresses that established survey methods remain essential, and that remote techniques such as radar may only supplement, not replace, species-level baseline data (because they cannot identify bird species or provide ecological context).

11. The use of radar for detecting bird movements and flight heights is well documented (Skjold et al., 2023; Skov *et al*., 2022; Feather *et al*., 2025). However, radar systems detect targets based on reflectivity, which may result in difficulties in detection of small species such as passerines, particularly when they occur at low densities. It may not be possible to distinguish certain targets from phenomena such as precipitation, sea clutter, or other atmospheric interference. This is particularly true in marine environments where false positives are common. Feather et al. (2025) state that, "*radar data contain well known sampling errors and observation biases, especially in challenging environments such as open sea*".

12. Furthermore, horizontal coverage and vertical resolution can be relatively limited; radar systems can have difficulties accurately measuring altitudes at fine scales at offshore sites, especially when measuring low-density movements, which would be typical of the Irish Sea corridor (Birol et al.; 2024, Brooks et al., 2018). Critically, however, even though radar may have supplementary applications in detecting the presence of movement of objects (birds) through a site, it cannot provide the information required for a robust characterisation of migration flux, as it cannot determine which species are transiting the site, nor differentiate between seabirds, wildfowl, waders, passerines, or even non-avian targets or atmospheric clutter. As a result, any flux estimate derived solely from radar would consist of counts of unidentified targets, with no ability to apportion movements to species, populations, or designated sites. At best, the use of site-specific radar could offer a complementary dataset, describing general movement intensity or directional trends of objects, but it cannot be used as a substitute for

empirically derived, species-level information which is required by statutory and non-statutory guidance.

13. The utility of radar is better suited to post-construction monitoring of migratory movements through operational wind farms rather than general site-specific collision risk assessment. It is not possible to determine precise flux estimates through a defined turbine array footprint (ORJIP Offshore Wind review, 2022; Williams et al., 2023).

3 Conclusions

14. Given the above evidence, the use of radar is unsuitable for characterising migratory movements across the array site on a site-only basis. Migration through the Irish Sea occurs at a regional scale, with birds dispersing over broad corridors which far exceed the spatial coverage of any single radar installation. Migratory activity fluctuates between years, seasons and consecutive days. Short-duration, site-specific radar is therefore insufficient for quantifying migratory movements or for determining whether detected flux is typical or anomalous. In addition, migratory species differ markedly in their flight heights, responses to weather and movement behaviours. These factors can all affect detectability by radar and introduce biases which cannot be corrected without species-level identification.

15. For the purposes of EIAR, a robust, quantitative characterisation of migratory activity must therefore be derived from both established empirical literature and long-term regional datasets. These are sufficient in capturing the scale, variability and species-specific nature of migration patterns. Consequently, the Applicant considers that site-specific radar alone would not enhance the ornithological baseline, when compared with the broader, multiyear datasets already available for the wider Irish Sea region, which offer the level of ecological detail required to inform collision risk assessment and support a defensible EIAR.

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Appendix H - Suitability of DAS for Characterising Manx Shearwater Activity


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Abbreviations

Abbreviation	Term in Full
ACP	An Coimisiún Pleanála
CWP	Codling Wind Park
DAS	Digital Aerial Survey
EIAR	Environmental Impact Assessment Report
GPS	Global Positioning System
SPA	Special Protected Area

1 Introduction

1. This appendix has been prepared in response to FIR item 7h, which relates to the suitability of the Digital Aerial Survey (DAS) method for characterising Manx shearwater (*Puffinus puffinus*) activity at sea as part of the impact assessment for Codling Wind Park (CWP); here after the project. Specifically, FIR 7h relates to the perception that Manx shearwater is a nocturnal, cryptic species and with DAS flights taking place during the hours of daylight. ACP has sought justification from the Applicant with regards to this method for quantifying Manx shearwater activity within the region (See FIR response document).

2 Methods

2. Sources of information were sought pertaining to the behaviour of breeding Manx shearwaters within UK and Irish waters, with a particular focus on Global Positioning System (GPS) tracking studies in the Irish Sea.

3. Data obtained from recent, relevant Manx shearwater tracking studies were compared against the timing of DAS surveys undertaken during the baseline survey campaign. Behavioural patterns were inferred from the patterns of activity observed within the array site plus a 4 km buffer.

3 Results

3.1 Literature review

4. Digital aerial surveys (DAS) are widely recognised within Scottish marine ornithology guidance as an appropriate method for collecting baseline data on seabird distribution and abundance in offshore environments. NatureScot's Marine Ornithology Guidance Notes for offshore wind development (NatureScot, 2023) highlight the need for robust, spatially explicit datasets to inform EIA and HRA processes and identify digital aerial methods as a key tool for acquiring such information. The Irish Government's marine bird research programme OBSERVE employs DAS as its primary data-collection approach within Scottish waters, including for Manx shearwater. This use of DAS supports its use as an established and accepted survey method for characterising activity patterns of Manx shearwater and other *procellariiform* species within the offshore environment.

5. Manx shearwater are well-adapted for life at sea, with legs set far back on the body to facilitate swimming. This front-heavy body plan does, however, make the birds clumsy on land, rendering them vulnerable to diurnal predators such as large gulls and birds of prey which may be present in the vicinity of breeding colonies (Syposz *et al*., 2018).

6. It is well documented that the Manx shearwater, a burrow-nesting species, is nocturnally active when leaving from and returning to its breeding colonies. Entering and exiting from the breeding burrow under the cover of darkness is a strategy to reduce predation (Richards *et al*. 2019). This predator-avoidance strategy around the colony is not required while the birds are less vulnerable to predation at-sea.

7. A GPS tracking study on birds breeding on Skomer (Wales, UK) showed that Manx shearwaters had two main periods of flight activity during the day. Firstly, from dawn until approximately 10:00 am and again from the afternoon and early evening (Guilford *et al*., 2008). The authors proposed that this pattern of activity during daylight hours suggest that birds are spending mornings and evenings commuting between their marine foraging grounds and near-colony rafting areas (just offshore from

the breeding colony), with the middle part of the day spent fishing and nighttime hours spent sitting on the sea. Guilford *et al*. (2008) also suggested that spatial distribution of birds during nighttime was more "clustered", supporting the suggestion that birds are participating in communal rafting behaviours overnight, rather than actively foraging.

8. Manx shearwater has the largest foraging range of any species screened-in to the EIAR and NIS assessment for the CWP Project, with the mean-maximum foraging range (plus one standard deviation) extending to 2,365.5 km (Woodward *et al*. 2019). The spatial data collected by Guilford *et al*. (2008) revealed that birds fitted with GPS tags on Skomer undertake foraging trips throughout the Irish Sea, with birds concentrating their foraging efforts along the edges of deeper waters.

3.2 Summary of DAS findings

9. Site-specific DAS surveys were carried out between May 2020 and April 2022. Surveys covered the array site plus a 2 km buffer. A full account of the DAS methodology used during the baseline survey campaign can be found in **Appendix 10.5** of the **EIAR**.

10. The estimated average abundance of Manx shearwater present within the array site plus a 2 km buffer during the months of March to October inclusive was 322.6 individuals (101.7 flying birds and 220.8 sitting birds). Birds were observed throughout the survey area and throughout the daylight hours during which each survey was flown.

11. The earliest start time was 05:52 am and the latest finish time was 16:53 pm. Nineteen out of the 24 survey flights began during the morning. The timings of DAS flights undertaken throughout the survey campaign are shown in **Table 1**, below.

Table 1: Timings of DAS flights undertaken during the baseline characterisation period. Flights are shown in order of earliest to latest start time

Survey date	Start time	End time
03/08/20	05:52	07:31
10/07/20	06:37	08:10
21/06/20	06:41	08:16
29/05/20	06:49	08:30
11/09/21	07:30	09:14
06/05/21	08:09	09:56
18/09/20	08:11	09:51
19/04/21	08:32	10:09
03/04/22	08:44	10:16
12/03/22	08:51	10:36
23/10/21	09:10	10:51
17/03/21	09:28	11:18
11/02/22	09:29	10:56
15/10/20	09:58	11:24

Survey date	Start time	End time
10/11/21	10:03	11:34
13/11/20	10:10	11:53
13/01/22	10:23	12:02
20/12/20	10:47	12:22
06/03/21	11:09	12:51
07/06/21	12:15	13:43
02/12/21	12:19	13:51
03/02/21	12:39	14:18
23/07/21	15:13	16:52
02/08/21	15:17	16:53

12. The distribution and activity of Manx shearwater recorded within study area has been further demonstrated by more recent data validation surveys (see **Appendix 10-D** of the **EIAR addendum**). These data demonstrate the validity of the original surveys and their appropriateness for informing for the EIA. Patterns of behaviour observed were consistent with those observed during the baseline survey period.

13. It is also noted that the patterns of distribution and activity observed in Manx shearwater during the contemporary DAS campaign also corroborate and support the findings of baseline boat-based ESAS surveys which took place within the survey area between October 2018 and August 2020 (see **EIAR Appendix 10.5: Offshore ornithology baseline characterisation report**).

4 Discussion

14. It is presumed that Manx shearwaters recorded in the region during breeding season baseline DAS surveys represent individuals from breeding colonies around the Irish Sea which lie within foraging range of the array site. Notable colonies include Skomer, Little Saltee (County Wexford, Ireland), Bardsey (Gwynedd, Wales) and Copeland Island (County Down, Northern Ireland).

15. The annual occurrence of Manx shearwater recorded during the baseline DAS campaign was consistent with what would be expected within the western Irish Sea, with birds absent from November to early-March inclusive. The occurrence of birds present within the marine area during DAS visits in the breeding season was also consistent with that described from published literature; birds were observed to be present within the marine environment during the hours of daylight and exhibiting a mixture of sitting and flying behaviours.

16. As the majority of surveys took place in the morning (19/24 visits began before noon), the Manx shearwater activity observed is consistent with the morning peak of commuting and foraging flight activity as described by Guilford *et al*. (2008).

17. Manx shearwaters exhibiting both sitting and flying behaviours were consistently detected during daytime surveys, which took place during this species' breeding season. These birds are active during the hours of daylight whilst at-sea and are likely to be roosting on the sea at night. That Manx shearwaters are active at night around their breeding colony is not a reasonable basis for assuming that they would be active at night in the array site and the available published information does not

support this assumption. The published information does however support the Applicant's position in that DAS is an appropriate methodology for characterising the usage of the array site by Manx shearwater.

5 Conclusion

18. The published evidence supports the conclusion that Manx shearwater engage in nocturnal activity when visiting their nest sites as a predator avoidance strategy and that their behaviour at sea can be characterised by a mixture of commuting, foraging and rafting behaviours as observed in other "diurnal" seabird species such as auks, fulmar, gulls and gannet.

19. The pattern of presence and distribution of Manx shearwater during the breeding season as recorded during the DAS campaign support these findings, with birds present throughout the site both in flight and on the sea, and recorded on the site during the hours of daylight during which the survey flights took place.

20. In light of the published evidence outlined above, and given the abundance and distribution of Manx shearwater recorded during all times of day during the DAS survey campaign, the DAS methodology is a robust methodology to evaluate the usage of the array site plus a 2 km buffer by Manx shearwater.

21. Conclusions relating to operation and maintenance phase disturbance and displacement impacts to Manx shearwater within both the EIAR and NIS remain valid.

22. The evidence laid out above necessitates no changes to the NIS addendum in relation to FIR item 7h. This is on the basis that the assessment of any impacts on the conservation objectives, in relation to the breeding Manx shearwater features, of relevant Special Protected Areas (SPAs) are informed by those sites' designated population sizes. As these population sizes have not changed, the conclusions drawn as part of the NIS assessment of the site both alone and in-combination remain valid.

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codling wind park

FIR

FIR Response Document

Appendix I - Alternative Outputs Referencing NatureScot Higher Displacement and Mortality Rates


codling
wind park

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Abbreviations

Abbreviation	Term in full
CEA	Cumulative Effects Assessment
CGR	Counterfactual of population growth rate
CPS	Counterfactual of population size
CWP	Codling Wind Park
EIAR	Environmental Impact Assessment Report
FIR	Further Information Request
NIS	Natura Impact Assessment
PVA	Population Viability Assessment
SPA	Special Protection Area

1 Introduction

1. Codling Wind Park Limited (hereafter 'the Applicant') is proposing to develop the Codling Wind Park (CWP) Project, which is located in the Irish sea approximately 13 - 22 km off the east coast of Ireland, at County Wicklow.

2. This Technical Appendix forms part of the Applicant's response to Item 7i in the **FIR Response Document**. Specifically, this Technical Appendix presents alternative EIAR and NIS outputs for operational phase displacement impacts to guillemot, razorbill, puffin, gannet and kittiwake when displacement and mortality rates suggested in NatureScot (2023) guidance are used as a basis for assessment rather than those rates considered by the Applicant to be best supported by available evidence, which were used in **Volume 3, Chapter 10 Ornithology** of the EIAR and **Volume 5, Assessment of Implications for Special Protection Areas – Part 2** of the NIS.

1.1 EIAR context

3. **Table 1**, below, details a step-wise process by which project only and cumulative displacement impacts to the regional populations of each species are provided in relation to displacement and mortality rates used in the Applicant's EIAR also in relation to alternative rates outlined within NatureScot (2023) guidance.

Project-only impact assessment structure

- Step 1 – Total annual displacement mortality to the regional population of each species from the project alone (operational phase impacts) for each displacement scenario (assessed scenario in bold, plus additional requested scenarios) have been calculated by summing estimated seasonal displacement mortality estimates from displacement matrices presented within **Volume 4, Appendix 10.4 Offshore Ornithology Displacement** of the EIAR (for guillemot, razorbill, puffin and gannet) and **Appendix 10-H Kittiwake Displacement Matrices** of the **EIAR Addendum**.
- Step 2 – Regional populations of each species are defined as the maximum number of individuals within the region within any single season. These values and information on their derivation are provided in **Volume 4, Appendix 10.5 Offshore Ornithology Baseline Characterisation Report** of the EIAR.
- Step 3 – Average annual mortality rates of all individuals within the regional population are taken from **Table 2.14** of **Appendix 10.5: Offshore Ornithology Baseline Characterisation** of the EIAR. [Mortality rates are the residual of survival rates; for example, an adult survival rate of 90%, is expressed as a mortality rate of 10%].
- Step 4 – Annual regional mortality is calculated by multiplying the regional population (Step 2), by the average annual mortality rate (Step 3).
- Step 5 – Proportional increase to annual mortality from project-only displacement impacts is calculated by dividing project-only annual mortality estimates (Step 1) by the background predicted level of annual mortality within the region (Step 4).
- Step 6 – Population Viability Analysis (PVA) modelling is required to determine impact significance when the proportional increase to regional annual mortality exceeds 1%.
- Step 7 – Where impacts result in proportional increases to regional annual mortality do not exceed 1%, impact magnitudes are sufficiently small (classed as either negligible or low), that impacts are assessed as non-significant in EIA terms. Should proportional increases exceed 1%, PVA outputs are used to inform assessment of significance.

Cumulative-impact assessment structure

- Step 8 – Total annual displacement mortality to the regional population of each species from all other relevant projects, based upon the published impacts estimated by each of those projects is taken from the **Appendix 1** of the **CEA Report, Part 2**.

- Step 9 – Total cumulative displacement mortality to the regional population of each species from all other relevant projects and CWP is calculated by summing these additional mortality estimates (Step 1 + Step 8).
- Step 10 – Proportional increase to annual mortality from cumulative displacement impacts is calculated by dividing total cumulative annual mortality estimates (Step 9) by the background predicted level of annual mortality within the region (Step 4).

Table 1: Comparison between displacement rates used in the EIAR (bold = rates considered best supported by evidence) and NatureScot guidance (2023) rates. Both NatureScot guidance (2023) rates for kittiwake also presented.

Step	Species	Guillemot			Razorbill			Puffin			Gannet		Kittiwake	
	Displacement scenario	**50%; 1%**	60%; 1% (br*[1]) 3% (nbr*[2])	60%; 3% (br) 5% (nbr)	**50%; 1%**	60%; 1% (br) 3% (nbr)	60%; 3% (br) 5% (nbr)	**50%; 1%**	60%; 1% (br) 3% (nbr)	60%; 3% (br) 5% (nbr)	**70%; 1%**	70%; 3%	30%; 1%	30%; 3%
	Project-only													
1	Estimated additional annual mortality from project-only.	**84.82**	145.27	348.84	**30.42**	44.60	117.61	**1.00**	2.33	4.73	**1.86**	5.58	7.48	22.43
2	Regional population	1,332,663			632,448			304355			643,713		928,207	
3	Average annual mortality rate	13.60%			12.90%			17.70%			18.10%		15.60%	
4	Annual regional mortality	181,242.20			81,585.79			53870.835			116,512.10		144800.29	
5	Project-only proportional increase to annual mortality	**0.047%**	0.080%	0.192%	**0.037%**	0.055%	0.144%	**0.002%**	0.004%	0.009%	**0.002%**	0.005%	0.005%	0.015%
6	PVA required to determine significance?	**No**	No	No	**No**	No	No	**No**	No	No	**No**	No	No	No
7	Significant impact in EIA terms?	**No**	No	No	**No**	No	No	**No**	No	No	**No**	No	No	No
	CEA													
8	Annual mortality (other projects)	842.85			249.99			N/A*[3]			57.34		N/A*[3]	
9	Annual mortality (other projects + CWP)	**927.67**	988.12	1191.69	**280.41**	294.59	367.6				**59.20**	62.92		
[2]	[Regional population]	1,332,663			632,448						643,713			
[3]	[Average annual mortality rate]	13.60%			12.90%						18.10%			
[4]	[Annual regional mortality]	181,242.20			81,585.79						116,512.10			
10	Cumulative proportional increase to annual mortality	**0.512%**	0.545%	0.658%	**0.344%**	0.361%	0.451%				**0.051%**	0.054%		
[6]	PVA required to determine significance?	**No**	No	No	**No**	No	No				**No**	No		
[7]	Significant cumulative impacts in EIA terms?	**No**	No	No	**No**	No	No				**No**	No		

*[1] br: breeding season; *[2]nbr: non-breeding season(s)*

*[3] Cumulative displacement impacts to regional puffin and kittiwake populations are assessed to be of imperceptible impact significance and, as outlined in the CEA methodology (**Section 10** of the **CEA Report**) are accordingly not included within CEA as there is considered to be no potential for them to perceptibly contribute to a cumulative effect.*

1.2 NIS context

4. **Tables Table** 2 **- Table** 6, below, details a step-wise process by which project only and in-combination displacement impacts to relevant SPA populations of each species are assessed in relation to displacement and mortality rates used in the Applicant's NIS and also in relation to alternative rates outlined within NatureScot (2023) guidance.

Project-only impact assessment structure

- Step 1 – Total annual displacement mortality to each relevant SPA population of each species from the project alone (operational phase impacts) for each displacement scenario (assessed scenario in bold, plus additional requested scenarios) have been calculated by adding displacement impacts apportioned to the SPA colony in the breeding and non-breeding seasons.
    - Displacement impacts apportioned to the SPA colony during the breeding season were calculated by multiplying breeding season estimates from displacement matrices [presented within **Volume 4, Appendix 10.4 Offshore Ornithology Displacement** of the EIAR (for guillemot, razorbill, puffin and gannet) and **Appendix 10-H Kittiwake Displacement Matrices** of the **EIAR Addendum**] by the percentage of impacts apportioned to each colony (corrected for proportion of breeding adults) [presented in **Appendix 3: Apportioning Ratios Technical Appendix** in **Volume 7 – Appendices** of the NIS.
    - Displacement impacts apportioned to the SPA colony during non-breeding seasons were calculated by multiplying non-breeding season estimates from displacement matrices [presented within **Volume 4, Appendix 10.4 Offshore Ornithology Displacement** of the EIAR (for guillemot, razorbill, puffin and gannet) and **Appendix 10-H Kittiwake Displacement Matrices** of the **EIAR Addendum**] by the maximum non-breeding population (from **Volume 4, Appendix 10.5 Offshore Ornithology Baseline Characterisation Report** of the EIAR) divided by the SPA breeding population (i.e. the proportion of the birds from each SPA within the non-breeding population).
- Step 2 – SPA populations of each species are provided in **Appendix B** of **Volume 4, Appendix 10.5 Offshore Ornithology Baseline Characterisation Report** of the EIAR.
- Step 3 – Average annual mortality rates of breeding adults within the regional population are derived from the adult survival rates stated in **Table 2.14** of **Appendix 10.5: Offshore Ornithology Baseline Characterisation** of the EIAR. [Mortality rates are the residual of survival rates; for example, an adult survival rate of 90%, is expressed as a mortality rate of 10%].
- Step 4 – Annual SPA mortality is calculated by multiplying the SPA population (Step 2), by the average annual mortality rate (Step 3).
- Step 5 – Proportional increase to annual mortality from project-only displacement impacts is calculated by dividing project-only annual mortality estimates (Step 1) by the background predicted level of annual mortality for the SPA (Step 4).
- Step 6 – Population Viability Analysis (PVA) modelling is required to determine impact significance when the proportional increase to SPA annual mortality exceeds 1%.
- Step 7 – Where impacts are estimated to result in proportional increases to SPA annual mortality which do not exceed 1%, they are considered not to compromise conservation objective attributes relating to population size and therefore not to result in adverse effect on site integrity (AESI). Should proportional increases exceed 1%, PVA outputs were used to inform whether conservation objective attributes relating to population size may be compromised and result in AESI. Input parameters for each PVA (within the Natural England PVA tool) are provided within **Annexe A**, below. As density independent PVA modelling was used, priority is given to the counterfactual of population growth rate (CGR) PVA output value when considering potential for AESI. Counterfactual of population size (CPS) values after the 25-year operational phase of the project

are also presented for reference. In accordance with thresholds selected during the EAIR and NIS, where CGR values exceed 0.995, impacts are not considered to result in AESI.

In-combination impact assessment structure

5. The results of the project-only impact assessment, as presented in **Tables Table** 2 **- Table** 6, mean that an in-combination impact assessment (see Steps 8 – 10) is only required for guillemot and razorbill.

- Step 8 – Total annual displacement mortality to each relevant SPA population of each species apportioned by all other relevant projects, based upon the published impacts estimated by each of those projects is taken from the **Appendix 1** of the **CEA Report, Part 2**.
- Step 9 – Total in-combination displacement mortality to each relevant SPA population of each species from all other relevant projects and CWP is calculated by summing these additional mortality estimates (Step 1 + Step 8).
- Step 10 – Proportional increase to annual mortality from in-combination displacement impacts is calculated by dividing total in-combination annual mortality estimates (Step 9) by the background predicted level of annual mortality for the SPA (Step 4).

Table 2: Comparison between guillemot displacement rates used in the NIS assessment and NatureScot recommended displacement rates. Mortality is provided in apportioned units of breeding adults.

Step	SPA	Ireland's Eye SPA			Lambay Island SPA			Saltee Islands SPA		
	Displacement scenario	**50%; 1%**	60%; 1% (br*[1]) 3% (nbr*[2])	60%; 3% (br) 5% (nbr)	**50%; 1%**	60%; 1% (br) 3% (nbr)	60%; 3% (br) 5% (nbr)	**50%; 1%**	60%; 1% (br) 3% (nbr)	60%; 3% (br) 5% (nbr)
Project-only										
1	Annual mortality (CWP)	0.88	2.63	4.74	9.50	27.00	49.8	1.61	2.70	6.57
2	SPA population (breeding adults)	4410			59983			25851		
3	Average annual mortality rate (breeding adults)	6.10%			6.10%			6.10%		
4	Annual SPA mortality	269.01			3658.96			1576.91		
5	Increase to annual mortality	0.326%	0.978%	1.762%	0.260%	0.738%	1.361%	0.102%	0.171%	0.417%
6	PVA required?	No	No	Yes	No	No	Yes	No	No	No
7	Counterfactual of population growth rate (CGR)	N/A	N/A	0.999	N/A	N/A	0.999	N/A	N/A	N/A
	Counterfactual of population size (CPS; after 25 years)			0.970			0.976			
	Adverse effect on site integrity (AESI)?			No			No			
In-combination										
8	Annual mortality (other projects)	7.41			72.92			7.04		
9	Annual mortality (other projects + CWP)	8.29	10.04	12.15	82.42	99.92	122.72	8.65	9.74	13.61

Step	SPA	Ireland's Eye SPA			Lambay Island SPA			Saltee Islands SPA		
	Displacement scenario	**50%; 1%**	60%; 1% (br*1) 3% (nbr*2)	60%; 3% (br) 5% (nbr)	**50%; 1%**	60%; 1% (br) 3% (nbr)	60%; 3% (br) 5% (nbr)	**50%; 1%**	60%; 1% (br) 3% (nbr)	60%; 3% (br) 5% (nbr)
[2]	SPA population (breeding adults)	4410			59983			25851		
[3]	Average annual mortality rate (breeding adults)	6.10%			6.10%			6.10%		
[4]	Annual SPA mortality	269.01			3658.96			1576.91		
10	Increase to annual mortality	3.081%	3.732%	4.517%	2.253%	2.731%	3.354%	0.548%	0.617%	0.863%
[6]	PVA required?	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No
[7]	CGR	0.998	0.997	0.997	0.998	0.998	0.998	N/A	N/A	N/A
	CPS (after 25 years)	0.947	0.937	0.924	0.961	0.953	0.943			
	AESI?	No	No	No	No	No	No			

**1 br: breeding season; *2nbr: non-breeding season(s)*

Table 3: Comparison between razorbill displacement rates used in the NIS assessment and NatureScot recommended displacement rates. Mortality is provided in apportioned units of breeding adults per SPA

Step	SPA	Ireland's Eye SPA			Lambay Island SPA			Saltee Islands SPA		
	Displacement scenario	**50%; 1%**	60%; 1% (br*1) 3% (nbr*2)	60%; 3% (br) 5% (nbr)	**50%; 1%**	60%; 1% (br) 3% (nbr)	60%; 3% (br) 5% (nbr)	**50%; 1%**	60%; 1% (br) 3% (nbr)	60%; 3% (br) 5% (nbr)
Project-only										
1	Annual mortality (CWP)	0.33	0.99	1.76	1.18	3.40	6.18	0.32	0.56	1.32
2	SPA population (breeding adults)	1600			7353			5669		
3	Average annual mortality rate (breeding adults)	10.50%			10.50%			10.50%		
4	Annual SPA mortality	168.00			772.07			595.25		
5	Increase to annual mortality	0.196%	0.589%	1.048%	0.153%	0.440%	0.800%		0.094%	0.222%
6	PVA required?	No	No	Yes	No	No	No	No	No	No
7	CGR	N/A	N/A	0.999	N/A	N/A	N/A	N/A	N/A	N/A
	CPS (after 25 years)			0.970						
	AESI?			No						
In-combination										
8	Annual mortality (other projects)	1.77			7.57			3.54		
9	Annual mortality (other projects + CWP)	2.10	2.76	3.53	8.75	10.97	13.75	3.86	4.10	4.86
[2]	Regional population	1600			7353			5669		

Step	SPA	Ireland's Eye SPA			Lambay Island SPA			Saltee Islands SPA		
	Displacement scenario	**50%; 1%**	60%; 1% (br*1) 3% (nbr*2)	60%; 3% (br) 5% (nbr)	**50%; 1%**	60%; 1% (br) 3% (nbr)	60%; 3% (br) 5% (nbr)	**50%; 1%**	60%; 1% (br) 3% (nbr)	60%; 3% (br) 5% (nbr)
[3]	Average annual mortality rate	10.50%			10.50%			10.50%		
[4]	Annual regional mortality	168.00			772.07			595.25		
10	Increase to annual mortality	1.250%	1.643%	2.101%	1.133%	1.421%	1.781%	0.648%	0.689%	0.816%
[6]	PVA required?	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No
[7]	CGR	0.999	0.998	0.998	0.999	0.998	0.998	N/A	N/A	N/A
	CPS (after 25 years)	0.962	0.951	0.938	0.965	0.955	0.945			
	AESI?	No	No	No	No	No	No			

**1 br: breeding season; *2nbr: non-breeding season(s)*

Table 4: Comparison between puffin displacement rates used in the NIS assessment and NatureScot recommended displacement rates. Mortality is provided in apportioned units of breeding adults per SPA

Step	SPA	Ireland's Eye SPA			Lambay Island SPA			Saltee Islands SPA		
	Displacement scenario	**50%; 1%**	60%; 1% (br*1) 3% (nbr*2)	**60%; 3% (br) 5% (nbr)**	**50%; 1%**	**60%; 1% (br) 3% (nbr)**	**60%; 3% (br) 5% (nbr)**	**50%; 1%**	**60%; 1% (br) 3% (nbr)**	**60%; 3% (br) 5% (nbr)**
	Project-only									
1	Annual mortality (CWP)	0.02	0.06	0.10	0.01	0.02	0.04	0.25	0.71	1.32
2	SPA population (breeding adults)	288			1098			48528		
3	Average annual mortality rate (breeding adults)	9.40%			9.40%			9.40%		
4	Annual SPA mortality	27.07			103.21			4561.63		
5	Increase to annual mortality	0.074%	0.222%	0.369%	0.010%	0.019%	0.039%	0.005%	0.016%	0.029%
6	PVA required?	No	No	No	No	No	No	No	No	No
7	CGR	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	CPS (after 25 years)									
	AESI?									

**1 br: breeding season; *2nbr: non-breeding season(s)*

Table 5: Comparison between gannet displacement rates used in the NIS assessment and NatureScot recommended displacement rates. Mortality is provided in apportioned units of breeding adults per SPA

Step	SPA	Ireland's Eye SPA		Lambay Island SPA		Saltee Islands SPA		The Bull and the Cow Rocks SPA		Skelligs SPA	
	Displacement scenario	70%; 1%	70%; 3%	70%; 1%	70%; 3%	70%; 1%	70%; 3%	70%; 1%	70%; 3%	70%; 1%	70%; 3%
	Project-only										
1	Annual mortality (CWP)	0.05	0.14	0.31	0.92	0.17	0.51	0.03	0.08	0.14	0.42
2	SPA population (breeding adults)	9444		72022		66452		12776		70588	
3	Average annual mortality rate (breeding adults)	8.10%		8.10%		8.10%		8.10%		8.10%	
4	Annual SPA mortality	764.96		5833.78		5382.61		1034.86		5717.63	
5	Increase to annual mortality	0.007%	0.018%	0.005%	0.016%	0.003%	0.009%	0.003%	0.008%	0.002%	0.007%
6	PVA required?	No	No	No	No	No	No	No	No	No	No
7	CGR / CPS (after 25 years) / AESI?	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table 6: Comparison between kittiwake displacement rates used in the NIS assessment and NatureScot recommended displacement rates. Mortality is provided in apportioned units of breeding adults per SPA

Step	SPA	Wicklow Head SPA		Howth Head Coast SPA		Ireland's Eye SPA		Lambay Island SPA		Saltee Island SPA		Helvick Head to Ballyquin SPA		Ailsa Craig SPA		Rathlin Island SPA		Old Head of Kinsale SPA	
	Displacement scenario	30%; 1%	30%; 3%	30%; 1%	30%; 3%	30%; 1%	30%; 3%	30%; 1%	30%; 3%	30%; 1%	30%; 3%	30%; 1%	30%; 3%	30%; 1%	30%; 3%	30%; 1%	30%; 3%	30%; 1%	30%; 3%
	Project-only																		
1	Annual mortality (CWP)	0.22	0.66	0.14	0.42	0.03	0.09	0.20	0.61	0.02	0.06	0.001	0.003	0.01	0.02	0.19	0.58	0.01	0.03
2	SPA population (breeding adults)	1290	3546	802	6640	2076	130	980	27412	1442	1290	3546	802	6640	2076	130	980	27412	1442
3	Average annual mortality rate (breeding adults)	0.146	0.146	0.146	0.146	0.146	0.146	0.146	0.146	0.146	0.146	0.146	0.146	0.146	0.146	0.146	0.146	0.146	0.146
4	Annual SPA mortality	188.34	517.716	117.092	969.44	303.096	18.98	143.08	4002.152	210.532	188.34	517.716	117.092	969.44	303.096	18.98	143.08	4002.152	210.532
5	Increase to annual mortality	0.117%	0.350%	0.027%	0.081%	0.026%	0.077%	0.021%	0.063%	0.007%	0.020%	0.005%	0.016%	0.005%	0.015%	0.005%	0.015%	0.005%	0.014%
6	PVA required?	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
7	CGR / CPS (after 25 years) / AESI?	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

2 References

6. NatureScot. 2023. Guidance Note 8: Guidance to support Offshore Wind Applications: Marine Ornithology Advice for assessing the distributional responses, displacement and barrier effects of Marine birds.

ANNEXE A PVA OUTPUT LOGS

7. This annexe provides the PVA output logs for the models run to determine impacts to guillemot and razorbill at Ireland's Eye SPA and Lambay Island SPA.

Annexe A.1 Ireland's Eye SPA: Guillemot

Set up

The log file was created on: 2026-03-27 12:10:01 using Tool version 2, with R version 4.2.2, PVA package version: 4.18 (with UI version 1.7)

```
##                Package          Version
## popbio         "popbio"         "2.8"
## shiny          "shiny"          "1.8.0"
## shinyjs        "shinyjs"        "2.1.0"
## shinydashboard "shinydashboard" "0.7.3"
## shinyWidgets   "shinyWidgets"   "0.8.2"
## DT             "DT"             "0.33"
## plotly         "plotly"         "4.10.4"
## rmarkdown      "rmarkdown"      "2.25"
## dplyr          "dplyr"          "1.1.4"
## tidyr          "tidyr"          "1.3.1"
```

Basic information

This run had reference name ““.

PVA model run type: simplescenarios.

Model to use for environmental stochasticity: betagamma.

Model for density dependence: nodd.

Include demographic stochasticity in model?: Yes.

Number of simulations: 5000.

Random seed: 2744.

Years for burn-in: 0.

Case study selected: None.

Baseline demographic rates

Species chosen to set initial values: Common Guillemot.

Region type to use for breeding success data: Reg.Seas.

Available colony-specific survival rate: National. Sector to use within breeding success region: Irish Sea.

Age at first breeding: 6.

Is there an upper constraint on productivity in the model?: Yes, constrained to 1 per pair.

Number of subpopulations: 1.

Are demographic rates applied separately to each subpopulation?: No.

Units for initial population size: breeding.adults

Are baseline demographic rates specified separately for immatures?: Yes.

Population 1

Initial population values: Initial population 4410 in 2015

Productivity rate per pair: mean: 0.5489978 , sd: 0.2939644

Adult survival rate: mean: 0.94 , sd: 0.025

Immatures survival rates:

Age class 0 to 1 - mean: 0.56 , sd: 0.058 , DD: NA

Age class 1 to 2 - mean: 0.792 , sd: 0.152 , DD: NA

Age class 2 to 3 - mean: 0.917 , sd: 0.098 , DD: NA

Age class 3 to 4 - mean: 0.938 , sd: 0.107 , DD: NA

Age class 4 to 5 - mean: 0.94 , sd: 0.025 , DD: NA

Age class 5 to 6 - mean: 0.94 , sd: 0.025 , DD: NA

Impacts

Number of impact scenarios: 3.

Are impacts applied separately to each subpopulation?: No

Are impacts of scenarios specified separately for immatures?: No

Are standard errors of impacts available?: No

Should random seeds be matched for impact scenarios?: No

Are impacts specified as a relative value or absolute harvest?: relative

Years in which impacts are assumed to begin and end: 2028 to 2053

Impact on Demographic Rates

Scenario A - Name: PO (60-3/5)

All subpopulations

Impact on productivity rate mean: 0 , se: NA

Impact on adult survival rate mean: 0.001075 , se: NA

Scenario B - Name: IC (60-1/3)

All subpopulations

Impact on productivity rate mean: 0 , se: NA

Impact on adult survival rate mean: 0.002277 , se: NA

Scenario C - Name: IC (60-3/5)

All subpopulations

Impact on productivity rate mean: 0 , se: NA

Impact on adult survival rate mean: 0.002755 , se: NA

Output:

First year to include in outputs: 2015

Final year to include in outputs: 2053

How should outputs be produced, in terms of ages?: breeding.pairs

Target population size to use in calculating impact metrics: NA

Quasi-extinction threshold to use in calculating impact metrics: NA

Annexe A.2 Lambay Island SPA: Guillemot

Set up

The log file was created on: 2026-03-27 12:12:52 using Tool version 2, with R version 4.2.2, PVA package version: 4.18 (with UI version 1.7)

```
##                Package          Version
## popbio         "popbio"         "2.8"
## shiny          "shiny"          "1.8.0"
## shinyjs        "shinyjs"        "2.1.0"
## shinydashboard "shinydashboard" "0.7.3"
## shinyWidgets   "shinyWidgets"   "0.8.2"
## DT             "DT"             "0.33"
## plotly         "plotly"         "4.10.4"
## rmarkdown      "rmarkdown"      "2.25"
## dplyr          "dplyr"          "1.1.4"
## tidyr          "tidyr"          "1.3.1"
```

Basic information

This run had reference name ““.

PVA model run type: simplescenarios.

Model to use for environmental stochasticity: betagamma.

Model for density dependence: nodd.

Include demographic stochasticity in model?: Yes.

Number of simulations: 5000.

Random seed: 2744.

Years for burn-in: 0.

Case study selected: None.

Baseline demographic rates

Species chosen to set initial values: Common Guillemot.

Region type to use for breeding success data: Reg.Seas.

Available colony-specific survival rate: National. Sector to use within breeding success region: Irish Sea.

Age at first breeding: 6.

Is there an upper constraint on productivity in the model?: Yes, constrained to 1 per pair.

Number of subpopulations: 1.

Are demographic rates applied separately to each subpopulation?: No.

Units for initial population size: breeding.adults

Are baseline demographic rates specified separately for immatures?: Yes.

Population 1

Initial population values: Initial population 59983 in 2015

Productivity rate per pair: mean: 0.5489978 , sd: 0.2939644

Adult survival rate: mean: 0.94 , sd: 0.025

Immatures survival rates:

Age class 0 to 1 - mean: 0.56 , sd: 0.058 , DD: NA

Age class 1 to 2 - mean: 0.792 , sd: 0.152 , DD: NA

Age class 2 to 3 - mean: 0.917 , sd: 0.098 , DD: NA

Age class 3 to 4 - mean: 0.938 , sd: 0.107 , DD: NA

Age class 4 to 5 - mean: 0.94 , sd: 0.025 , DD: NA

Age class 5 to 6 - mean: 0.94 , sd: 0.025 , DD: NA

Impacts

Number of impact scenarios: 3.

Are impacts applied separately to each subpopulation?: No

Are impacts of scenarios specified separately for immatures?: No

Are standard errors of impacts available?: No

Should random seeds be matched for impact scenarios?: No

Are impacts specified as a relative value or absolute harvest?: relative

Years in which impacts are assumed to begin and end: 2028 to 2053

Impact on Demographic Rates

Scenario A - Name: PO (60-3/5)

All subpopulations

Impact on productivity rate mean: 0 , se: NA

Impact on adult survival rate mean: 0.00083 , se: NA

Scenario B - Name: IC (60-1/3)

All subpopulations

Impact on productivity rate mean: 0 , se: NA

Impact on adult survival rate mean: 0.001666 , se: NA

Scenario C - Name: IC (60-3/5)

All subpopulations

Impact on productivity rate mean: 0 , se: NA

Impact on adult survival rate mean: 0.002046 , se: NA

Output:

First year to include in outputs: 2015

Final year to include in outputs: 2053

How should outputs be produced, in terms of ages?: breeding.pairs

Target population size to use in calculating impact metrics: NA

Quasi-extinction threshold to use in calculating impact metrics: NA

Annexe A.3 Ireland's Eye SPA: Razorbill

Set up

The log file was created on: 2026-03-27 12:22:46 using Tool version 2, with R version 4.2.2, PVA package version: 4.18 (with UI version 1.7)

```
##                Package          Version
## popbio         "popbio"         "2.8"
## shiny          "shiny"          "1.8.0"
## shinyjs        "shinyjs"        "2.1.0"
## shinydashboard "shinydashboard" "0.7.3"
## shinyWidgets   "shinyWidgets"   "0.8.2"
## DT             "DT"             "0.33"
## plotly         "plotly"         "4.10.4"
## rmarkdown      "rmarkdown"      "2.25"
## dplyr          "dplyr"          "1.1.4"
## tidyr          "tidyr"          "1.3.1"
```

Basic information

This run had reference name ““.

PVA model run type: simplescenarios.

Model to use for environmental stochasticity: betagamma.

Model for density dependence: nodd.

Include demographic stochasticity in model?: Yes.

Number of simulations: 5000.

Random seed: 2744.

Years for burn-in: 0.

Case study selected: None.

Baseline demographic rates

Species chosen to set initial values: Razorbill.

Region type to use for breeding success data: Reg.Seas.

Available colony-specific survival rate: National. Sector to use within breeding success region: Irish Sea.

Age at first breeding: 5.

Is there an upper constraint on productivity in the model?: Yes, constrained to 1 per pair.

Number of subpopulations: 1.

Are demographic rates applied separately to each subpopulation?: No.

Units for initial population size: breeding.adults

Are baseline demographic rates specified separately for immatures?: Yes.

Population 1

Initial population values: Initial population 1600 in 2015

Productivity rate per pair: mean: 0.5378833 , sd: 0.2026453

Adult survival rate: mean: 0.895 , sd: 0.067

Immatures survival rates:

Age class 0 to 1 - mean: 0.794 , sd: 0.067 , DD: NA

Age class 1 to 2 - mean: 0.794 , sd: 0.067 , DD: NA

Age class 2 to 3 - mean: 0.895 , sd: 0.067 , DD: NA

Age class 3 to 4 - mean: 0.895 , sd: 0.067 , DD: NA

Age class 4 to 5 - mean: 0.895 , sd: 0.067 , DD: NA

Impacts

Number of impact scenarios: 3.

Are impacts applied separately to each subpopulation?: No

Are impacts of scenarios specified separately for immatures?: No

Are standard errors of impacts available?: No

Should random seeds be matched for impact scenarios?: No

Are impacts specified as a relative value or absolute harvest?: relative

Years in which impacts are assumed to begin and end: 2028 to 2053

Impact on Demographic Rates

Scenario A - Name: PO (60-3/5)

All subpopulations

Impact on productivity rate mean: 0 , se: NA

Impact on adult survival rate mean: 0.0011 , se: NA

Scenario B - Name: IC (60-1/3)

All subpopulations

Impact on productivity rate mean: 0 , se: NA

Impact on adult survival rate mean: 0.001725 , se: NA

Scenario C - Name: IC (60-3/5)

All subpopulations

Impact on productivity rate mean: 0 , se: NA

Impact on adult survival rate mean: 0.002206 , se: NA

Output:

First year to include in outputs: 2015

Final year to include in outputs: 2053

How should outputs be produced, in terms of ages?: breeding.pairs

Target population size to use in calculating impact metrics: NA

Quasi-extinction threshold to use in calculating impact metrics: NA

Annexe A.4 Lambay Island SPA: Razorbill

Set up

The log file was created on: 2026-03-27 12:30:08 using Tool version 2, with R version 4.2.2, PVA package version: 4.18 (with UI version 1.7)

```
##                Package          Version
## popbio         "popbio"         "2.8"
## shiny          "shiny"          "1.8.0"
## shinyjs        "shinyjs"        "2.1.0"
## shinydashboard "shinydashboard" "0.7.3"
## shinyWidgets   "shinyWidgets"   "0.8.2"
## DT             "DT"             "0.33"
## plotly         "plotly"         "4.10.4"
## rmarkdown      "rmarkdown"      "2.25"
## dplyr          "dplyr"          "1.1.4"
## tidyr          "tidyr"          "1.3.1"
```

Basic information

This run had reference name ““.

PVA model run type: simplescenarios.

Model to use for environmental stochasticity: betagamma.

Model for density dependence: nodd.

Include demographic stochasticity in model?: Yes.

Number of simulations: 5000.

Random seed: 2744.

Years for burn-in: 0.

Case study selected: None.

Baseline demographic rates

Species chosen to set initial values: Razorbill.

Region type to use for breeding success data: Reg.Seas.

Available colony-specific survival rate: National. Sector to use within breeding success region: Irish Sea.

Age at first breeding: 5.

Is there an upper constraint on productivity in the model?: Yes, constrained to 1 per pair.

Number of subpopulations: 1.

Are demographic rates applied separately to each subpopulation?: No.

Units for initial population size: breeding.adults

Are baseline demographic rates specified separately for immatures?: Yes.

Population 1

Initial population values: Initial population 1600 in 2015

Productivity rate per pair: mean: 0.5378833 , sd: 0.2026453

Adult survival rate: mean: 0.895 , sd: 0.067

Immatures survival rates:

Age class 0 to 1 - mean: 0.794 , sd: 0.067 , DD: NA

Age class 1 to 2 - mean: 0.794 , sd: 0.067 , DD: NA

Age class 2 to 3 - mean: 0.895 , sd: 0.067 , DD: NA

Age class 3 to 4 - mean: 0.895 , sd: 0.067 , DD: NA

Age class 4 to 5 - mean: 0.895 , sd: 0.067 , DD: NA

Impacts

Number of impact scenarios: 2.

Are impacts applied separately to each subpopulation?: No

Are impacts of scenarios specified separately for immatures?: No

Are standard errors of impacts available?: No

Should random seeds be matched for impact scenarios?: No

Are impacts specified as a relative value or absolute harvest?: relative

Years in which impacts are assumed to begin and end: 2028 to 2053

Impact on Demographic Rates

Scenario A - Name: IC (60-1/3)

All subpopulations

Impact on productivity rate mean: 0 , se: NA

Impact on adult survival rate mean: 0.001492 , se: NA

Scenario B - Name: IC (60-3/5)

All subpopulations

Impact on productivity rate mean: 0 , se: NA

Impact on adult survival rate mean: 0.00187 , se: NA

Output:

First year to include in outputs: 2015

Final year to include in outputs: 2053

How should outputs be produced, in terms of ages?: breeding.pairs

Target population size to use in calculating impact metrics: NA

Quasi-extinction threshold to use in calculating impact metrics: NA



codling wind park

J

FIR Response Document

Appendix J - Site-specific Flight Height Distribution Data for Collision Risk Modelling


codling
wind park

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Abbreviations

Abbreviation	Term in Full
ACP	An Coimisiún Pleanála
CRM	Collision Risk Modelling
CWP	Codling Wind Park
DAS	Digital Aerial Surveys
ESAS	European Seabird at Sea
FHD	Flight Height Distribution
PCH	Potential Collision Height
SNCB	Statutory Nature Conservation Bodies
UK	United Kingdom
WTG	Wind Turbine Generator

Definitions

Glossary	Meaning
the Applicant	The developer, Codling Wind Park Limited (CWPL).
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.
Collision Risk Modelling (CRM)	A method of estimating the risk (which can be either deterministic or stochastic) to seabirds of collision (and estimated mortality) with operational turbines.

1 Introduction

1. Codling Wind Park Limited (hereafter 'the Applicant') is proposing to develop the Codling Wind Park (CWP) Project, which is located in the Irish sea approximately 13 - 22 km off the east coast of Ireland, at County Wicklow.

2. This appendix forms part of the Applicant's response to Item 7L in the **FIR Response Document**. It provides justification of the use of site-specific flight height distribution (FHD) data where it was utilised within Collision Risk Modelling (CRM) undertaken to assess impacts for CWP. Specifically, this approach was applied to kittiwake, herring gull and gannet.

3. In RFI item 7L, ACP stated that, "*A combination of site-specific and generic FHD data has been used in collision modelling, with site-specific data informing assessment conclusions where available. The Commission therefore requests that the applicant uses generic FHD data to inform assessment conclusions with site specific data presented and discussed for additional context where relevant".*

4. As the Applicant maintains that basing assessment conclusions upon site-specific FHD data, where that data is considered sufficiently robust to do, remains the most appropriate approach to assessment, this appendix presents a rationale for the applicant's decision-making process.

2 Justification of the use of site-specific flight height distribution data for Collision Risk Modelling within the original application

2.1 Background

5. Collision Risk Modelling (CRM) is used to quantify the potential collision mortality of selected species during the operational phase of a proposed wind farm development. CRM approaches originate from Band, 2012. Band, 2012, outlines three model options to address interaction between flight height and rotor swept area:

   - Option 1 (BO1) – Basic model (i.e. assuming uniform distribution of flight heights between lowest and highest rotor swept altitudes), using Flight Height Distribution (FHD) data collected during site-specific surveys;
   - Option 2 (BO2) – Basic model (i.e. assuming uniform distribution of flight heights between lowest and highest rotor swept altitudes), using generic FHD data[1]; and
   - Option 3 (BO3) – Extended model (i.e. assuming non-uniform distribution of flight heights between lowest and highest rotor swept altitudes), using generic FHD data[1].

6. Band, 2012 summarised that justification of the use of model options to quantify collision mortality should be considered on a site-by-site basis. The definitions of CRM options outlined above are those which have been used when undertaking CRM for the CWP application. Specifically, where the CWP Project delineates between the use of BO1 and BO2 models when assessing operational phase collision impacts, this differentiation is on the basis of model options utilising site-specific FHD data or generic FHD data respectively[2]. Due to uncertainty relating to the appropriate avoidance rate values

[1] Generic FHD data used in BO2 and BO3 modelling is taken from datasets supporting Johnston *et al.*, 2014.

[2] This interpretation of BO definitions differs with subsequent interpretations, which define BO1 models as those for which proportions of flight activity at potential collision height are input as a value by the user, and BO2 models as those for which proportions of flight height at potential collision height are generated within the tool from supplied height FHDs.

to apply within the extended model option (BO3), the use of BO3 is not recommended by statutory nature conservation bodies in the UK (i.e. NatureScot 2023 guidance note 7).

7. The primary determinant of whether generic or site-specific FHD data should be utilised in CRM is whether suitable site-specific flight height information is available. If no such data have been collected during baseline ornithological surveys of the proposed array site, species specific sample sizes are too small to provide a robust estimate of FHD, or the data are not sufficiently accurate, then CRMs should be undertaken using generic FHD data.

8. At the time of writing, flight height estimates from Digital Aerial Surveys (DAS)[3] have not been considered sufficiently robust to inform impact assessment by UK regulators or Statutory Nature Conservation Bodies (SNCBs) and have not been used in baseline dataset collection for OWF projects in Ireland. Therefore, projects in the UK frequently utilise generic FHD models for CRM where baseline datasets entirely comprise of information collected using DAS.

9. Baseline datasets collected using boat-based European Seabird at Sea (ESAS) surveys, can include surveyor estimates of flight heights. Site-specific, species-specific, FHD data collected during these surveys can be used to inform CRMs if the FHD data collected at the site is considered suitable.

10. It is also noted that Irish guidance (Department of Communications, Climate Action & Environment, 2018) supports site-specific flight height data collection and use, stating: "*This* [flight height] *data should be recorded as accurately as possible, e.g. +/- 10/20m, rather than in generic flight bands. This will ensure the usability of the data regardless of future changes in turbine design. In addition, this will allow a refinement of the collision risk model to reflect the fact that most seabirds fly close to the sea-surface and may only be at risk of collision with the lower sweep of the rotor".*

11. For CWP the baseline ornithological dataset published with the application comprises DAS information collected between May 2020 and April 2022 (24 surveys) and boat-based (ESAS) survey information collected between October 2018 and July 2020 (15 surveys), during which surveyor estimates of flight heights were recorded[4].

12. As such, where sufficiently robust site-specific FHDs were available from these surveys, in line with relevant guidance best practice[5], CWP utilised these data from both surveys in the collision impact assessment. Conclusions were based upon the outputs from CRM using site-specific FHDs and flight density estimations calculated from DAS datasets (BO1 models). Where conclusions were based on BO1, CRM outputs from generic FHDs (BO2 models) were presented as additional contextual information; again this aligns with relevant guidance and best practice[6]. Where species sample sizes from ESAS datasets were insufficient to generate robust site-specific FHDs, collision impact assessment conclusions were based upon CRM outputs using generic FHDs (BO2 models) and flight density estimations calculated from DAS datasets.

13. Justification of this approach by CWP is provided in the following sections. These outline:

---

[3] Present DAS flight height estimation (excluding for LiDAR equipped aircraft, which have not yet been used in baseline dataset collection for OWF projects in Ireland) is undertaken using aerial photogrammetry. Such approaches have relatively low accuracy and estimations of proportions of flight activity at collision risk height are currently considered inappropriate for use in CRM.

[4] Further data on kittiwake flight heights within the Array Site and surrounding 4 km buffer was collected during additional boat-based ESAS surveys undertaken in June and July 2025 (2 surveys), these data validate the baseline dataset observations that, for kittiwake, the proportion of flight activity at potential collision height (>36 m a.s.l.) within this area continues to be significantly less than predicted using generic FHD data.

[5] Such as the 2024 joint advice note by UK SNCBs (JNCC, 2024) regarding bird collision risk modelling for offshore wind developments, which states: "*We recommend that robust site-specific flight height data is utilised for proposed offshore wind developments, if available.*"

[6] The 2024 joint advice note by UK SNCBs (JNCC, 2024) regarding bird collision risk modelling for offshore wind developments, while recommending the use of site-specific FHD data, recommends that Option 2 of the Basic Band model is always presented.

1. Why, for certain species, CWP's baseline datasets can be used to generate robust site-specific FHDs;
2. Why, where baseline datasets support robust site-specific FHDs, the use of these distributions to undertake CRMs upon which collision impact assessment conclusions are based (BO1), is more appropriate than the use of generic FHDs (BO2); and
3. The predicted difference between CRM outputs resultant from the use of site-specific (BO1) compared to generic (BO2) FHDs.

2.2 Determination of whether site-specific FHDs are robust for use in CRM

14. Whether site-specific FHDs are sufficiently robust to underpin CRM relates to several criteria:

A. The sample size from which the distribution is generated;
B. The accuracy of surveyor flight height estimations;
C. The precision of flight height estimations; and
D. The statistical means by which the FHD is generated.

15. Flight height data collected during CWP baseline ESAS surveys are considered in relation to each of these criteria, below.

A. Sample Size

16. Johnston and Cook, 2016, observed a large degree of uncertainty around modelled FHDs where sample sizes were fewer than 100 individuals and therefore regarded this as a minimum threshold in model selection. As such, site-specific FHDs were only considered appropriate for CRM where the sample size for the species was greater than 100[7] records.

17. Of the species considered potentially susceptible to collision with rotor blades[8], sample sizes (number of records) were greater than 100 for four species;

- Kittiwake (number of records = 1,184, number of individuals = 2,117);
- Gannet (number of records = 456, number of individuals = 538);
- Herring gull (number of records = 281, number of individuals = 378); and
- Common tern (number of records =136, number of individuals = 310).

18. Kittiwake sample size was more than tenfold greater than the minimum threshold from Johnston and Cook, 2016. Therefore, taking sample size alone there is a robust justification for the use of site-specific FHDs for CWP. It is also relevant to note that the generic FHDs were derived from multiple locations around the UK and North Sea, rather than Irish waters. Similarly, for gannet and herring gull, sample sizes also greatly exceed the minimum threshold advised by Johnston and Cook, 2016. For these species it would also be more robust to place reliance on site specific FHDs from Irish waters than generic FHDs from UK waters. For common tern, where the number of records slightly exceeds the minimum threshold from Johnston and Cook, 2016, site-specific FHDs from Irish waters may be more robust, if distribution curves fit well to observed distributions (see criteria 4, below).

[7] Note, as records may relate to more than one individual, this constitutes a more conservative threshold than that used taken from Johnston and Cook, 2016.

[8] Excluding auks, Manx shearwater and fulmar – which were screened out of assessment in relation to collision impacts on the basis of flying at heights which almost never overlap with potential collision height.

19. **In summary, sample sizes from the CWP boat-based ESAS surveys in Irish waters are sufficiently large to produce site-specific FHDs for kittiwake, gannet, herring gull and common tern, which are considered robust if the other criteria outlined are also met.**

B. Flight height estimation accuracy

20. For CWP, flight height estimation during boat-based ESAS surveys was undertaken by a team of certified and experienced ESAS surveyors using vessels which met ESAS recommendations (i.e. surveyor eye level, viewing position and transect speed).

21. It is possible that boat-based observers may inaccurately estimate the flight heights of some observed seabirds, with a bias varying with distance from the observer. This inaccuracy may cause bias in the estimated FHDs. It should, however, be noted that the same sources of inaccuracy and bias also apply to the data used to create generic FHDs as these were also derived from boat-based ESAS observers.

22. Data used to estimate generic FHDs (Johnston et al., 2014) were collated from a total of 32 offshore sites around the UK and southern North Sea, of which 27 used boat-based ESAS methodologies. Despite surveyors being ESAS certified it is recognised that differences in individual surveyors can affect the outputs from analyses. In that context it is relevant to note that the lead surveyors responsible for co-ordinating and undertaking boat-based ESAS surveys for CWP were also responsible for collecting some, or all, of the boat-based ESAS data collected at five of the 32 site surveys undertaken to inform the generic (Johnston et al., 2014) FHDs. There is therefore demonstrable consistency between the surveyors and methods used to inform both the generic and CWP site-specific FHDs.

23. Furthermore, to increase flight height estimation accuracy and minimise potential bias associated with surveyor error, a laser range finder with an altitudinal difference function was routinely used by surveyors during baseline ESAS surveys for CWP. This device, along with knowledge of observer eye level, was used to facilitate calibration of flight height estimation.

24. **In summary, flight height estimation undertaken at CWP followed an established protocol and the level of flight height estimation accuracy was the same industry leading quality as that used to create generic FHDs. Consequently, FHDs generated from the CWP boat-based ESAS survey data in Irish waters are considered robust if the other criteria outlined are also met.**

C. Flight height estimation precision

25. During boat-based ESAS surveys undertaken for CWP, following guidance from Scally et al., 2018, flight heights were attributed as precisely as possible [rather than to broad altitudinal bands]. The following approach was followed:

- to the nearest metre for birds below 5 m in height;
- to the nearest five metres for birds 5 - 50 m in height;
- to the nearest 10 m for birds 50 – 100 m in height; and
- to the nearest 20 m for birds more than 100 m in height.

26. With this approach a bird flying within 100 m of sea level has been attributed to one of 19 available flight heights. This level of flight height estimation precision is greater than for the flight height banding approaches which underly the generic FHDs, and is therefore more than sufficient to generate species-specific FHDs for the CWP array site. This not only aligns with well recognised recent best practice, but also the approach referred to within the available Irish guidance (Department of Communications, Climate Action & Environment, 2018).

27. **FHDs generated from the CWP boat-based ESAS survey data in Irish waters are robust if the other criteria outlined are also met.**

D. Method used to generate FHDs (Goodness of fit)

28. Using a standardisation of data approach, flight heights recorded by observers were 're-binned' to address some heights being recorded as the nearest metre rather than in the broader bins set out in the established methodology. The bins used were 0-2.5 m, and then in 5 m increments subsequently, up until 60 m which was the greatest height recorded in all cases, except for a single observation of four herring gulls at 125 m. This observation was attributed to the 60 m bin as flight heights are less likely to be correctly recorded at the greater heights. The number of animals within a bin were summed and divided by the width of the bin to account for variable bin widths.

29. Linear regression models with an exponential form were fitted to flight height data for each species, of the form log(N) ~ Y, where N is the number of birds per altitude bin, divided by the bin width, and Y is the mid-point of the altitude bin. Model fit was assessed by comparing fitted lines to raw data, and by considering R2 values, a measure of goodness of fit. R2 values range from 0 to 1, with values closer to 0 indicating a poor fit, and a value of 1 indicating a perfect fit to the data. As stochastic CRM models allow the input of a standard deviation around the mean proportion of birds at collision risk height, as well as the mean value, models were bootstrapped to propagate uncertainty. Following a standard approach to characterise variance, the data for each species was randomly resampled, and models subsequently fitted 1000 times, to provide 1000 flight height curves that standard deviation of the bootstrap mean could be estimated from.

30. Model-fit curves were used to predict bird presence (once back-transformed) at 1 m increments between 1 m and 300 m, to match the range predicted across by Johnston et al., 2014. Over this 300 m range, the number of birds per 1 m altitude was divided by the sum of the total number of birds, to provide a proportion of birds at that height. This was then used to sum the proportion of flight activity within rotor-swept heights.

31. **Table 1** shows which distribution curves were fitted to FHDs for each of the four species at CWP where boat-based ESAS survey sample sizes were sufficient to permit curve fitting (with a sample size greater than 100 records). Goodness of fit, R^2, values are also presented for each fitted curve

Table 1 Distribution curves with associated sample sizes and goodness of for values for each species

Species	Distribution curve	Sample size	Goodness of fit value (R^2)
Kittiwake	Exponential linear regression	1,184	0.84
Gannet	Exponential linear regression	456	0.92
Herring gull	Exponential linear regression	281	0.73
Common tern	Exponential linear regression	136	0.68

32. Linear models were deemed to present a good fit for kittiwake, gannet and herring gull, with high R^2 values. Model fit for common terns was poorer, informed by the fewest data– half as many as the next smallest sample size (herring gull). Due to this combination of a lower R^2 goodness of fit measure and

smaller sample size, it was considered prudent not to use site specific FHD to inform CRM for common tern[9], despite the data quantity being adequate to justify the use of site-specific flight height data.

33. These distributions differ from that fitted to create the generic FHD curves[10], however for both generic and site-specific distributions the same over-arching rationale was followed such that distribution curves which optimised model fit were applied to the FHD datasets. Goodness of fit (R^2) values associated with the exponential linear regression curve applied to site specific FHDs were similarly high to those for distribution curves applied to generic FHD datasets in Johnston *et al.*, 2014[11], with the exception of common tern.

34. **In summary, an appropriate approach to curve fitting was followed in the generation of site-specific FHDs in Irish waters. From this site-specific FHDs for kittiwake, gannet and herring gull are considered sufficiently robust if the other criteria outlined are also met.**

2.2.1 Review of FHD robustness criteria

35. For three species (kittiwake, gannet and herring gull) baseline ESAS flight height estimate sample sizes necessary for the generation of site-specific FHDs were considerably larger than the minimum threshold. Methods employed during baseline ESAS surveys exceeded the conditions relating to flight height estimation accuracy and precision, aligned with relevant guidance at an Irish and regional level, and represented best practice. The goodness of fit values for curves fitted to these FHD data were high. Therefore, it was concluded that site-specific FHDs generated from baseline ESAS data in Irish waters were robust for use in CRM for kittiwake, gannet and herring gull. BO1 CRM presented the most appropriate option for the assessment of collision risk impacts for CWP (see **Section 2.3**, below).

36. For one species (common tern) baseline ESAS flight height estimate sample sizes necessary for the generation of site-specific FHDs exceeded the minimum threshold, albeit narrowly (depicted in by **Table 2** (✓). Although the methods employed during baseline ESAS surveys exceeded the conditions relating to flight height estimation accuracy and precision, it was concluded that the goodness of fit values for curves fitted to those data were not sufficient to determine site-specific FHDs. For common tern, BO2 CRM presented the most appropriate option for the assessment of collision risk impacts.

37. For all other species baseline ESAS flight height estimate sample sizes were below the minimum recommended threshold. For these species BO2 CRM was the most appropriate option to assess collision risk impacts.

38. A summary of robustness criteria for each species, and whether site-specific FHDs from Irish waters should be used to inform CRMs for impact assessment is provided in **Table 2**.

---

[9] With this in mind, it should be noted that BO2 model flight height distributions include greater proportions of common tern flight activity at heights above 36 m (i.e. within collision risk altitudes) and hence are more conservative than BO1 models (See Table 2, below)

[10] In Johnston *et al*., 2014, a flexible curve, not constrained to any specific distributional form was used – specifically a cubic spline on the log scale with six knots (Wood, 2006 p. 124). Splines are nonparametric, so unconstrained in the shapes they fit, and can be unimodal, bimodal or more complex. This flexibility is useful in fitting to data that may not conform to typical statistical distributions. The number of knots defines the degree of flexibility, and six knots were chosen by considering the degree of flexibility required to model bird flight height behaviour. The locations of the knots were set at evenly spaced quantiles of the mid-points of the height categories across all sites, so that more knots were placed where the data were of a higher resolution.

[11] Comparable R^2 values for distribution curves applied to generic FHDs in Johnston *et al.*, 2014 are: kittiwake - 0.87 [compared to 0.84, see Table 1, above], gannet – 0.81 [*c.f.* 0.92], herring gull – 0.73 [*c.f.* 0.73] and common tern 0.97 [*c.f.* 0.68].

Table 2 Summary of FHD robustness criteria

Species	FHD robustness criteria:				Are site-specific FHDs sufficiently robust to use for CRM?
	1. Sample size	2. Flight height estimation accuracy	3. Flight height estimation precision	4. FHD curve goodness of fit	
Kittiwake	✓	✓	✓	✓	**Yes**
Gannet	✓			✓	**Yes**
Herring gull	✓			✓	**Yes**
Common tern	(✓)			X	**No**
Other species	X			NA	**No**

2.3 Justification of the appropriateness of the use of site-specific FHDs to determine collision impact assessment conclusions?

39. A large body of evidence exists to demonstrate that seabirds alter their flight heights in relation to their behaviour (e.g. whether they are foraging or commuting, or while employing differing foraging strategies[12]), the time of year (e.g. during migration and non-migration periods[13]), in relation to environmental conditions (e.g. in different wind speeds (Davies *et al.,* 2024)), and between specific sea areas. As seabirds utilise different sea areas to undertake particular behaviours (for example foraging behaviours may occur more frequently in areas of certain habitat) and do so to differing extents at different times of year and as different areas experience different prevailing environmental conditions, it follows that seabird flight height distributions differ spatially and temporally.

40. CRM is undertaken to estimate collision mortality within a specific sea area; in this instance within the CWP Array Site It follows that models utilising flight height data collected within that area will incorporate flight height distributions which more closely align with true flight height distributions within that area and are more likely to result in more robust outputs than models relying upon the use of generic flight height data not collected from that location. As such, where sufficiently robust site-specific, species-specific FHDs are available, the use of such site-specific distributions for CRM are more appropriate than the use of generic FHDs (JNCC, 2024). Where baseline datasets permit, BO1 CRM approaches are preferable to BO2 (or BO3).

41. **In summary, as the site-specific FHDs of kittiwake, herring gull and gannet from Irish waters are considered sufficiently robust to inform CRM, the use of BO1 models as a basis for impact assessment is considered appropriate for these species as it represents the best site-specific scientific data on which to base conclusions.**

[12] This includes Garthe & Hüppop, 2004; Shamoun-Baranes *et al.* 2006; Blew *et al.* 2008; Newton, 2010; Krijgsveld *et al.* 2011; Stumpf *et al.* 2011; Wright *et al.* 2012; and Cleasby *et al.* (2015)

[13] Garthe & Hüppop 2004; Blew *et al.* 2008; Newton, 2010; Krijgsveld *et al.* 2011; Wright et al. 2012

2.4 Comparison of CRM outputs based upon site-specific FHDs to outputs based upon generic FHDs

42. Proportion of flight activity at Potential Collision Height (PCH) scales directly with CRM output values. As such, if site-specific and generic flight FHDs differ this will result in differences in collision mortality estimations between BO1 and BO2 models.

43. An indication of how such differences will manifest themselves for the CRM using a hypothetical wind turbine generator (WTG) model for CWP is provided in **Table 3**. For kittiwake and gannet, the proportion of flight activity at PCH is lower from models using site-specific FHDs than for generic FHDs. For herring gull the opposite is true, with a larger proportion of flight activity at PCH for the site-specific FHD. Consequently, for kittiwake and gannet BO1 models result in lower collision mortality predictions than BO2 models, while for herring gull BO1 models result in higher collision mortality predictions than BO2 models. This not only demonstrates that (in this case) site-specific FHDs are scientifically appropriate and objective, but highlights that generic FHDs are not necessarily inherently more precautionary, and that their use must be justified on a case-by-case basis.

44. **In summary, BO1 collision risk models, are used for impact assessment for CWP for kittiwake, gannet and herring gull, as the site-specific FHDs from Irish waters required for these models were considered sufficiently robust and likely to provide more realistic outputs than would be obtained using BO2 (generic FHD) options. BO1 (site-specific FHD) models predict lower collision mortality values for kittiwake and gannet, and higher collision mortality values for herring gull.**

Table 3 Comparison between proportions of flight activity above given altitudes under BO1 (site-specific FHD) and BO2 (generic FHD) models.

Species	CRM option: Site-specific of generic FHD?	Total proportion of flight activity above … (%)						
		5m	10m	15m	20m	25m	30m	36m
		Below PCH (airgap for CWP WTGs = 36 m from Mean Sea Level)						PCH
Kittiwake	Site-specific	48.9	26.9	14.8	8.1	4.4	2.3	**1.2**
	Generic[14]	62.2	38.7	24.1	15.0	9.3	5.8	**3.2**
Gannet	Site-specific	44.8	23.0	11.8	6.0	3.1	1.5	**0.7**
	Generic[14]	59.6	35.5	21.1	12.6	7.5	4.4	**2.4**
Herring gull	Site-specific	74.6	58.5	46.0	36.3	28.6	22.6	**17.8**
	Generic[14]14	75.3	56.6	42.6	32.0	24.0	18.0	**12.7**
Common tern	Site-specific	36.9	18.5	8.7	4.1	1.9	0.9	**0.4**
	Generic[14]	52.2	27.2	14.2	7.4	3.8	2.0	**0.9**

[14] Sum of proportions of flight activity above each specified height (above MSL) from SOSS spreadsheet (Cook *et al.,* 2012) from Johnston *et al*., 2014.

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Appendix K - Project-Only PVA Requirement Review


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Abbreviations

Abbreviation	Term in Full
ACP	An Coimisiún Pleanála
CRM	Collision Risk Modelling
CWP	Codling Wind Park
EIAR	Environmental Impact Assessment Report
PVA	Population Viability Analysis

1 Introduction

1. Codling Wind Park Limited (hereafter 'the Applicant') is proposing to develop the Codling Wind Park (CWP) Project, which is located in the Irish sea approximately 13 - 22 km off the east coast of Ireland, at County Wicklow.

2. This appendix forms part of the Applicant's response to Item 7r in the **FIR Response Document.** Specifically, this appendix presents a review of the seasonal increases to baseline mortality from the operation and maintenance phase project only displacement and collision impacts and requirement for Population Viability Analysis (PVA) to be undertaken.

3. In RFI item 7r, An Coimisiún Pleanála (ACP) stated that, "*The Commission notes that the population-level effects have been investigated through Population Viability Analysis (PVA) where project-related impacts result in a >1% increase in baseline mortalities. For the NIS, this has been compared against the relevant season population, however, for the EIAR, only the annual population is considered*.

   Table 10-119 in Chapter 10 of the EIAR presents the CRM results for Great Black-backed Gull Larus marinus and compares the estimated mortalities with the reference populations. When compared against the breeding population calculated via Method 2 (item 7(g) above refers), the increase in baseline mortality is 1.886%, which exceeds the 1% threshold for PVA.

   The Commission therefore requests the applicant to review estimated mortalities and increases in baseline mortality for all species, and to run PVAs to assess population-level effects where project-related impacts represent a >1% increase in baseline mortalities in any single season, annually, or SPA population. The EIAR and, where relevant, the NIS must be updated accordingly."

4. The review of the seasonal increases to baseline mortality for all relevant species from the operation and maintenance phase project only displacement impacts are presented in Section 2.1. The review of the seasonal increases to baseline mortality from the operation and maintenance phase project only collision impacts are presented in Section 2.2.

2 Review

2.1 Displacement Impacts

5. A review of the seasonal increases to baseline mortality from the operation and maintenance phase project only displacement impacts and requirement for PVA to be undertaken is provided in **Table 1**. Included are the species, season, modelling scenario (i.e. which displacement and mortality rates have been applied, the increase to baseline mortality (expressed as a percentage) and whether this increase to baseline mortality exceeds 1% and necessitates a PVA.

6. For the seven species assessed, the annual increase to baseline mortality does not exceed the 1% threshold that would necessitate additional PVA.

Table 1 Review of seasonal increases to baseline mortality from operation and maintenance phase project only displacement impacts and requirement for PVA to be undertaken.

Species	Season	Project only modelling scenario	Increase in baseline mortality (%)	PVA required?
Guillemot	Breeding (Method 2)	Displacement to 2 km. 60% displacement 5% mortality	0.251	No
	Non-breeding	Displacement to 2 km. 60% displacement 3% mortality	0.113	No
	Annual	Above seasonal scenarios combined	0.164	No
Razorbill	Breeding (Method 2)	Displacement to 2 km. 60% displacement 5% mortality	0.408	No
	Post-breeding migration	Displacement to 2 km. 60% displacement 3% mortality	0.095	No
	Winter non-migration		0.024	No
	Return migration		0.009	No
	Annual	Above seasonal scenarios combined	0.142	No
Puffin	Breeding (Method 2)	Displacement to 2 km. 60% displacement 5% mortality	0.017	No
	Post-breeding migration	Displacement to 2 km. 60% displacement 3% mortality	0.002	No
	Winter non-migration		0.001	No
	Return migration		0.000	No
	Annual	Above seasonal scenarios combined	0.008	No
Red-throated diver	Breeding (Method 2)	Displacement up to 10 km (where habitat suitable). 100% within array site, 57.175% within 0-5km buffer. 34.025% within 5-10km buffer. 1% mortality	0	No
	Post-breeding migration		0.003	No
	Winter non-migration		0.054	No
	Return migration		0.031	No
	Annual	Above seasonal scenarios combined	0.051	No
Manx	Breeding (Method 2)	Displacement to 2 km.	0.000	No

Species	Season	Project only modelling scenario	Increase in baseline mortality (%)	PVA required?
shearwater	Post-breeding migration	50% displacement 1% mortality	0.003	No
	Winter non-migration		0.000	No
	Return migration		0.002	No
	Annual	Above seasonal scenarios combined	0.003	No
Gannet	Breeding (Method 2)	Displacement to 2 km. 70% displacement 3% mortality	0.003	No
	Post-breeding migration		0.001	No
	Return migration		0.002	No
	Annual	Above seasonal scenarios combined	0.005	No
Kittiwake	Breeding (Method 2)	Displacement to 2 km. 30% displacement 3% mortality	0.024	No
	Post-breeding migration		0.008	No
	Return migration		0.005	No
	Annual	Above seasonal scenarios combined	0.015	No

2.2 Collision Impacts

7. A review of the seasonal increases to baseline mortality from the operation and maintenance phase project only collision impacts and requirement for PVA to be undertaken is provided in **Table 2**.

8. Included are the species, season, modelling scenario (i.e. which design layout and Band Option have been applied), the increase to baseline mortality (expressed as a percentage) and whether this increase to baseline mortality exceeds 1% and necessitates a PVA.

9. For the six species assessed, the annual increase to baseline mortality does not exceed the 1% threshold that would necessitate additional PVA.

Table 2 Review of seasonal increases to baseline mortality from operation and maintenance phase project only collision impacts and requirement for PVA to be undertaken

Species	Season	Project only modelling scenario	Increase in baseline mortality (%)	PVA required?
Kittiwake	Breeding (Method 2)	Band Option 1 CRM Design A	0.021	No
	Post-breeding migration		0.007	No

Species	Season	Project only modelling scenario	Increase in baseline mortality (%)	PVA required?
	Return migration		0.004	No
	Annual		0.013	No
Common gull	Breeding (Method 2)	Band Option 2 CRM Design A	0.000	No
	Post-breeding migration		0.005	No
	Return migration		0.009	No
	Annual		0.014	No
Great black-backed gull	Breeding (Method 2)	Band Option 2 CRM Design A	**1.886**	**Yes**
	Non-breeding		0.010	No
	Annual		0.082	No
Herring gull	Breeding (Method 2)	Band Option 1 CRM Design A	0.681	No
	Non-breeding		0.007	No
	Annual		0.081	No
Common tern	Breeding (Method 2)	Band Option 2 CRM Design A	0.006	No
	Post-breeding migration		0.016	No
	Return migration		0.001	No
	Annual		0.017	No
Gannet (revised as specified in RFI 7m)	Breeding (Method 2) – no macro avoidance correction	Band Option 1 CRM Design A	0.001	No
	Post-breeding migration – corrected for 70% macro avoidance		<0.001	No
	Return migration – corrected for 70% macro avoidance		<0.001	No
	Annual		<0.001	No



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Appendix L - TTS modelling outputs


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Abbreviations

Abbreviation	Term in Full
NMFS	National Marine Fisheries Service
SCANS	Small Cetaceans in European Atlantic waters and the North Sea
TTS	Temporary Threshold Shift

Definitions

Glossary	Meaning
TTS	Temporary reductions in hearing sensitivity, also referred to as auditory fatigue

1 Temporary Threshold Shift from piling

1. In response to Item 10a and Item 10a Point iii(1), the Applicant has provided Temporary Threshold Shift (TTS) modelling for pile driving in the underwater noise appendix (**Appendix 9-C Underwater Noise Modelling Assessment**) and this Appendix provides the TTS-onset impact ranges (m), impact area (km^2) and number of animals within the impacted area, using the NMFS (2024)[1] TTS-onset thresholds and assuming a limit on underwater noise of 169 dB $L_{E,p,ss,05}$ at 750m.
2. The maximum predicted TTS-onset range is 22 km for minke whales at the SE location (impacting 8 individuals) and 8 km for harbour porpoise at the NE location (impacting 17 individuals).
3. There is no overlap between piling TTS-onset ranges and any marine mammal SACs.
4. Each of the following sections provides the impact ranges, followed by the number of individuals potentially impacted, followed by an illustration of the TTS contours. It is important to note that the Section 1.5 provides the range and number of individuals potential impacted for sequential piling. As sequential piling is limited to this location the accompanying figure shows only the NW corner.

1.1 SE Location

Table 1 TTS-onset impact ranges at SE location

	LF TTS	HF TTS	VHF TTS	PW TTS
Weighted $L_{E,p,wtd,24h}$	168 dB	178 dB	144 dB	168 dB
Area (km^2)	580	< 0.01	63	1.2
Maximum range (m)	**22000**	< 50	7500	1100
Minimum range (m)	4200	< 50	1600	240
Mean range (m)	12000	< 50	3900	530

[1] For all references, to avoid duplication, please refer to the FIR response document

Table 2 Number of animals within the impacted area at SE location

Species	Density		TTS area (km^2)	# animals
Harbour porpoise	0.1225	CWP surveys (2020-2022)	63	8
Harbour porpoise	0.2803	SCANS IV block density	63	18
Bottlenose dolphin	0.2352	SCANS IV block density	< 0.01	<1
Common dolphin	0.2810	CWP surveys (2020-2022)	< 0.01	<1
Common dolphin	0.0272	SCANS IV block density	< 0.01	<1
Risso's dolphin	0.0008	CWP surveys (2020-2022)	< 0.01	<1
Risso's dolphin	0.0022	SCANS IV block density	< 0.01	<1
Minke whale	0.0019	CWP surveys (2020-2022)	580	1
Minke whale	0.0137	SCANS IV block density	580	8
Grey seal	0.1563	Carter *et al* (2022) average across array area & ECC	1.2	<1
Harbour seal	0.0075	Carter *et al* (2022) average across array area & ECC	1.2	<1

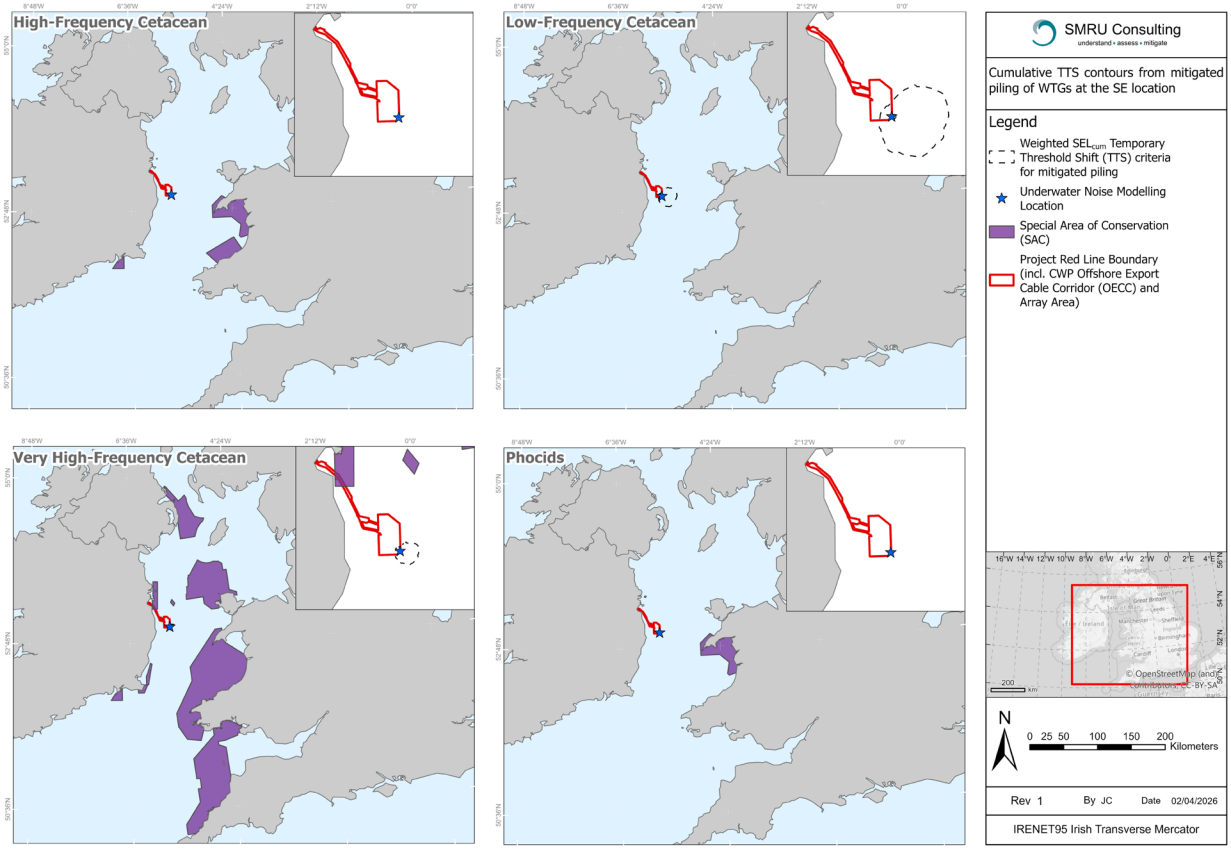


Figure 1 Cumulative TTS contours from mitigated piling at the SE location

1.2 SW Location

Table 3 TTS-onset impact ranges at SW location

	LF TTS	HF TTS	VHF TTS	PW TTS
Weighted $L_{E,p,wtd,24h}$	168 dB	178 dB	144 dB	168 dB
Area (km²)	200	< 0.01	65	2.3
Maximum range (m)	13000	< 50	6200	1300
Minimum range (m)	3400	< 50	2600	440
Mean range (m)	7200	< 50	4400	820

Table 4 Number of animals within the impacted area at the SW location

Species	Density	TTS area (km²)	# animals	Species
Harbour porpoise	0.1225	CWP surveys (2020-2022)	65	8
Harbour porpoise	0.2803	SCANS IV block density	65	18
Bottlenose dolphin	0.2352	SCANS IV block density	< 0.01	<1
Common dolphin	0.2810	CWP surveys (2020-2022)	< 0.01	<1
Common dolphin	0.0272	SCANS IV block density	< 0.01	<1
Risso's dolphin	0.0008	CWP surveys (2020-2022)	< 0.01	<1
Risso's dolphin	0.0022	SCANS IV block density	< 0.01	<1
Minke whale	0.0019	CWP surveys (2020-2022)	200	<1
Minke whale	0.0137	SCANS IV block density	200	3
Grey seal	0.1563	Carter *et al* (2022) average across array area & ECC	2.3	<1
Harbour seal	0.0075	Carter *et al* (2022) average across array area & ECC	2.3	<1

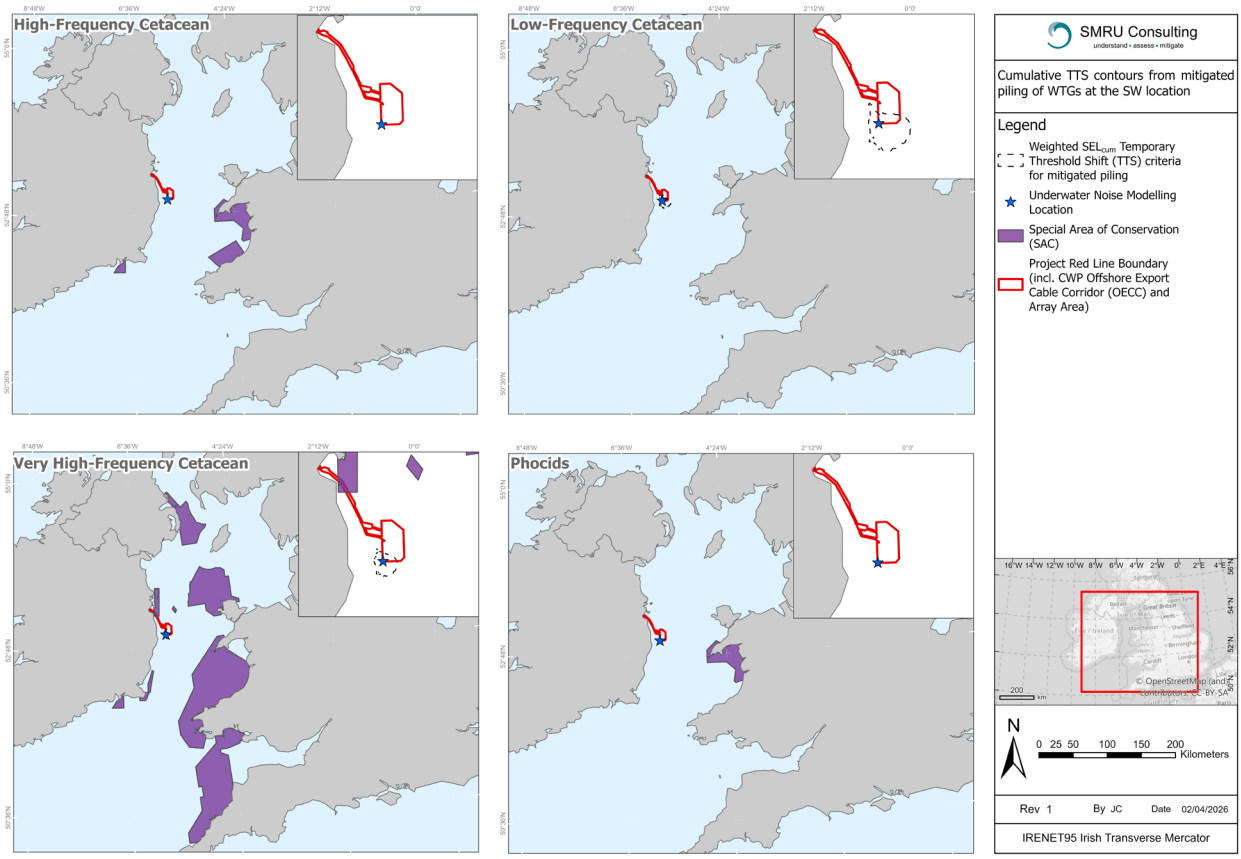


Figure 2 Cumulative TTS contours from mitigated piling at the SW location

1.3 NE Location

Table 5 TTS-onset impact ranges NE location

	LF TTS	HF TTS	VHF TTS	PW TTS
Weighted $L_{E,p,wtd,24h}$	168 dB	178 dB	144 dB	168 dB
Area (km²)	210	< 0.01	62	1.8
Maximum range (m)	16000	< 50	8000	1600
Minimum range (m)	1500	< 50	1200	150
Mean range (m)	6400	< 50	3800	570

Table 6 number of animals within the impacted area at the NE location

Species	Density	TTS area (km^2)	# animals	Species
Harbour porpoise	0.1225	CWP surveys (2020-2022)	62	8
Harbour porpoise	0.2803	SCANS IV block density	62	17
Bottlenose dolphin	0.2352	SCANS IV block density	< 0.01	<1
Common dolphin	0.2810	CWP surveys (2020-2022)	< 0.01	<1
Common dolphin	0.0272	SCANS IV block density	< 0.01	<1
Risso's dolphin	0.0008	CWP surveys (2020-2022)	< 0.01	<1
Risso's dolphin	0.0022	SCANS IV block density	< 0.01	<1
Minke whale	0.0019	CWP surveys (2020-2022)	210	0
Minke whale	0.0137	SCANS IV block density	210	3
Grey seal	0.1563	Carter *et al* (2022) average across array area & ECC	1.8	<1
Harbour seal	0.0075	Carter *et al* (2022) average across array area & ECC	1.8	<1

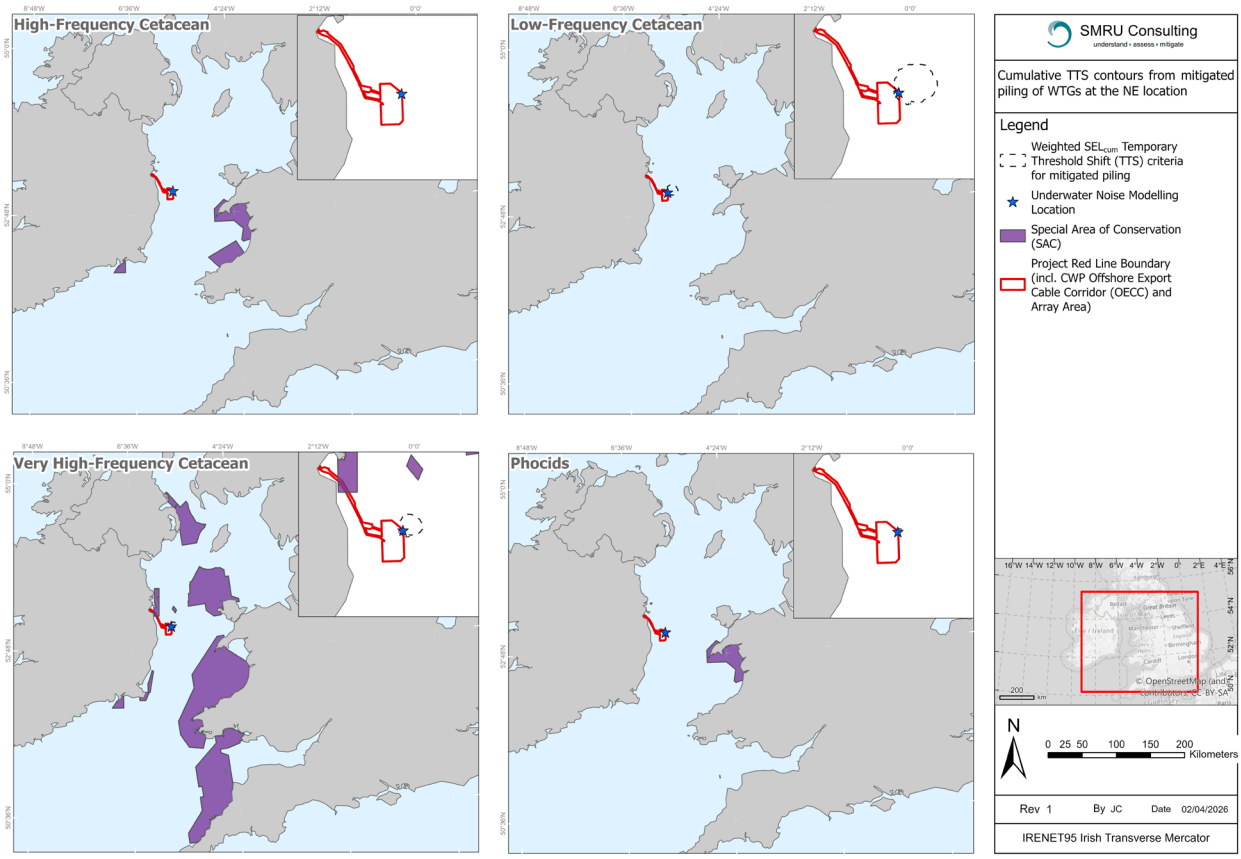


Figure 3 Cumulative TTS contours from mitigated piling at the NE location

1.4 NW Location

Table 7 TTS-onset impact ranges at NW location

	LF TTS	HF TTS	VHF TTS	PW TTS
Weighted $L_{E,p,wtd,24h}$	168 dB	178 dB	144 dB	168 dB
Area (km²)	44	< 0.01	22	0.47
Maximum range (m)	8000	< 50	5400	950
Minimum range (m)	1200	< 50	510	90
Mean range (m)	3200	< 50	2200	300

Table 8 Number of animals within the impacted area at the NW location

Species	Density	TTS area (km^2)	# animals	Species
Harbour porpoise	0.1225	CWP surveys (2020-2022)	22	3
Harbour porpoise	0.2803	SCANS IV block density	22	6
Bottlenose dolphin	0.2352	SCANS IV block density	< 0.01	<1
Common dolphin	0.2810	CWP surveys (2020-2022)	< 0.01	<1
Common dolphin	0.0272	SCANS IV block density	< 0.01	<1
Risso's dolphin	0.0008	CWP surveys (2020-2022)	< 0.01	<1
Risso's dolphin	0.0022	SCANS IV block density	< 0.01	<1
Minke whale	0.0019	CWP surveys (2020-2022)	44	<1
Minke whale	0.0137	SCANS IV block density	44	1
Grey seal	0.1563	Carter *et al* (2022) average across array area & ECC	0.47	<1
Harbour seal	0.0075	Carter *et al* (2022) average across array area & ECC	0.47	<1

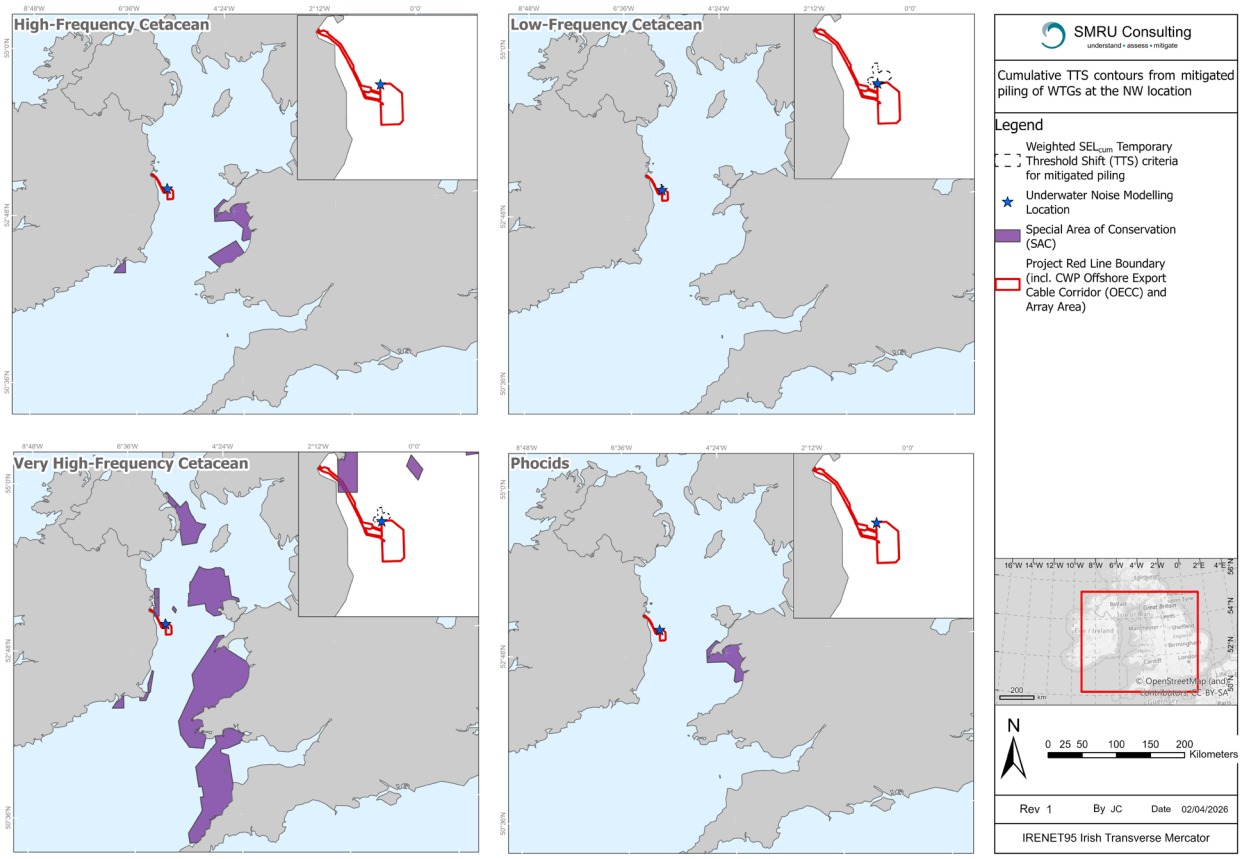


Figure 4 Cumulative TTS contours from mitigated piling at the NW location

1.5 Sequential piles

Table 9 TTS-onset impact ranges from sequential piling

	LF TTS	HF TTS	VHF TTS	PW TTS
Weighted $L_{E,p,wtd,24h}$	168 dB	178 dB	144 dB	168 dB
Area (km²)	47	< 0.01	26	0.54
Maximum range (m)	8200	< 50	5900	1100
Minimum range (m)	1200	< 50	510	90
Mean range (m)	3300	< 50	2400	320

Table 10 number of animals within the impacted area from sequential piling

Species	Density		TTS area (km^2)	# animals
Harbour porpoise	0.1225	CWP surveys (2020-2022)	26	3
Harbour porpoise	0.2803	SCANS IV block density	26	7
Bottlenose dolphin	0.2352	SCANS IV block density	< 0.01	<1
Common dolphin	0.2810	CWP surveys (2020-2022)	< 0.01	<1
Common dolphin	0.0272	SCANS IV block density	< 0.01	<1
Risso's dolphin	0.0008	CWP surveys (2020-2022)	< 0.01	<1
Risso's dolphin	0.0022	SCANS IV block density	< 0.01	<1
Minke whale	0.0019	CWP surveys (2020-2022)	47	<1
Minke whale	0.0137	SCANS IV block density	47	1
Grey seal	0.1563	Carter *et al* (2022) average across array area & ECC	0.54	<1
Harbour seal	0.0075	Carter *et al* (2022) average across array area & ECC	0.54	<1

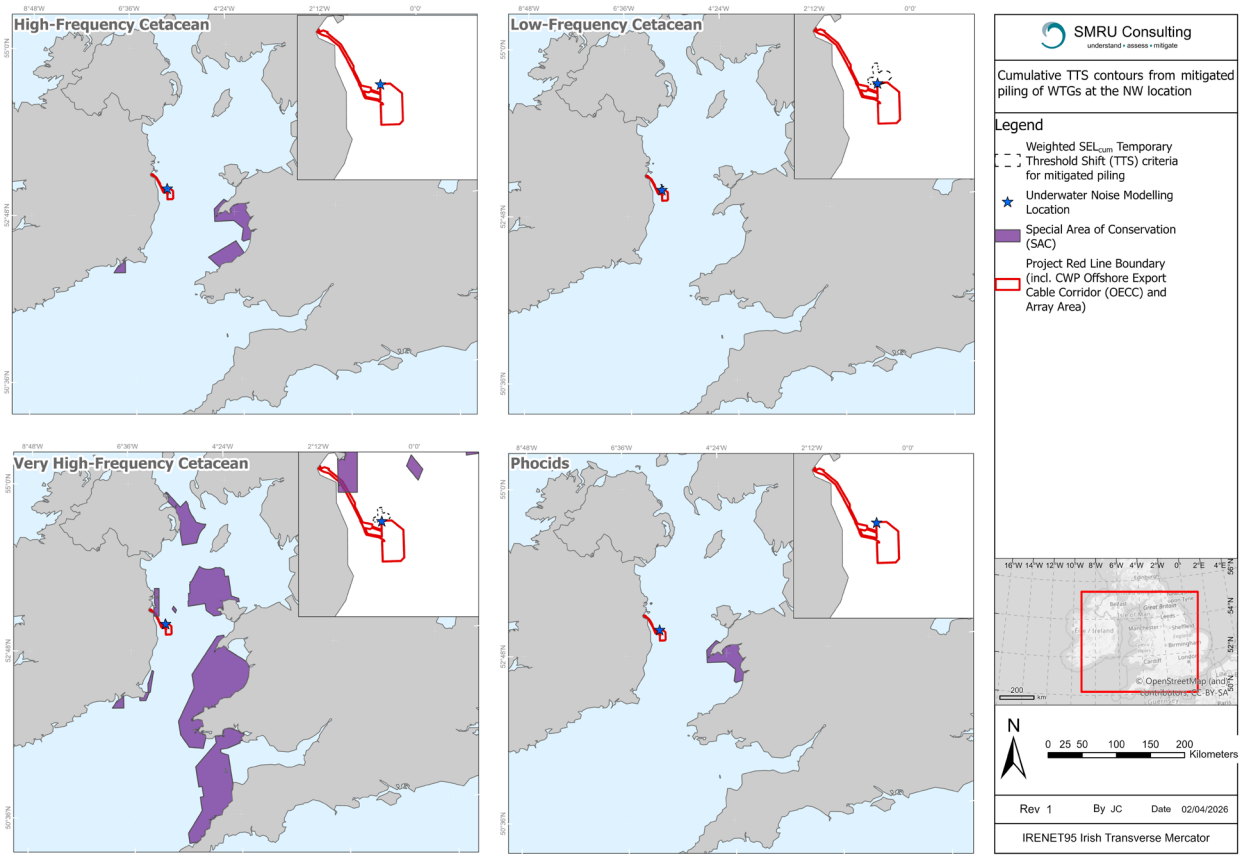


Figure 5 Cumulative TTS contours from mitigated piling at the NW location



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FIR

FIR Response Document

Appendix M - NMS approval of draft Marine Archaeology Management Plan (MAMP)


codling
wind park

From: Erlend Christiansen <[redacted]>
Sent on: Wednesday, March 11, 2026 1:26:53 PM
To: Erlend Christiansen <[redacted]>
Subject: FW: Draft MAMP

From: Erlend Christiansen
Sent: 25 February 2026 15:49
To: 'Cóilín Ó'Drisceoil (Housing)' [redacted]
Cc: Karl Brady (Housing) [redacted]
Subject: RE: Draft MAMP

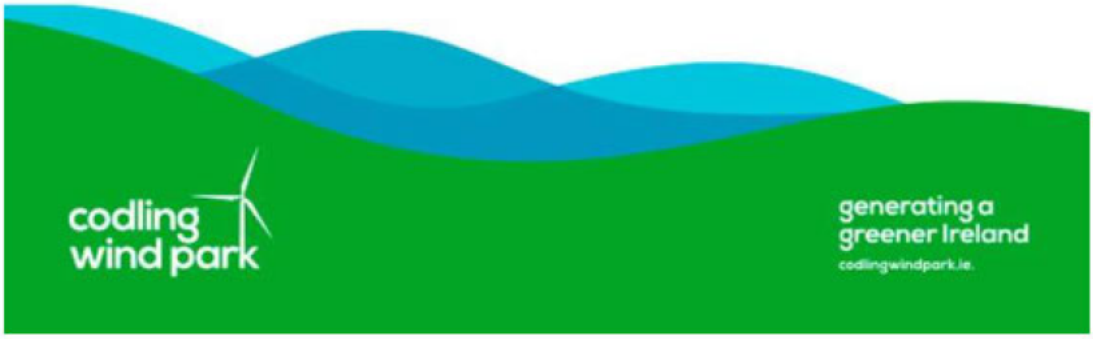
Hi Cóilín,

Thanks for confirming.

Much appreciated.

Kind Regards

Erlend Christiansen
Offshore Licensing Manager
C.Eng MSc. MIEI
Codling Wind Park
[redacted]
www.codlingwindpark.ie



From: Cóilín Ó'Drisceoil (Housing) [redacted]
Sent: 25 February 2026 15:37
To: Erlend Christiansen <[redacted]
Cc: Karl Brady (Housing) [redacted]
Subject: RE: Draft MAMP

Dear Erlend,

Please note that, without prejudice to our responses to further related submissions and planning consultations, NMS accepts the draft MAMP provided.

Should you require any further clarifications please do not hesitate to contact me.

Kind Regards

Cóilín

From: Erlend Christiansen <[redacted]
Sent: Wednesday 25 February 2026 14:43
To: Cóilín Ó'Drisceoil (Housing) [redacted]
Cc: Karl Brady (Housing) [redacted]
Subject: RE: Draft MAMP

CAUTION: This eMail originated from outside your organisation and the BTS Managed Desktop service. Do not click on any links or open any attachments unless you recognise the sender or are expecting the email and know that the content is safe. If you are in any doubt, please contact the OGCIO IT Service Desk.

Hi Cóilín,

Thanks for coming back. We will accept these changes.

On this basis, can you confirm acceptance of the draft MAMP?

Kind Regards

Erlend Christiansen
Offshore Licensing Manager
C.Eng MSc. MIEI
Codling Wind Park
[redacted]
www.codlingwindpark.ie



From: Cóilín Ó'Drisceoil (Housing) [redacted]
Sent: 25 February 2026 14:26
To: Erlend Christiansen <[redacted]
Cc: Karl Brady (Housing) [redacted]
Subject: RE: Draft MAMP

Dear Erlend,

Many thanks for your amended MAMP and please see attached some minor suggested edits (in track changes).

Please note this is provided by NMS as guidance and without prejudice to our responses to further related submissions and planning consultations.

Should you require any further clarifications please let me know.

All the best

Cóilín



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FIR

FIR Response Document

Appendix N - Letter from AirNav Ireland r.e. Dublin Airport

Seirbhís Aerloingseoireachta na hÉireann
ag trádáil mar AirNav na hÉireann
Foirgneamh na hAmanna
11–12 Sráid D'Olier
Baile Átha Cliath 2, D02 T449,
Éire

The Irish Air Navigation Service
trading as AirNav Ireland
The Times Building
11–12 D'Olier Street
Dublin 2, D02 T449,
Ireland

T: +353 1 603 1505
www.airnav.ie

Mr. Erlend Christiansen
Offshore Licensing Manager
Codling Wind Park

Re. Codling Wind Park Development Case Reference: OA29N.320768

Dear Erlend and to whom it may concern,

For the purposes of the planning application process as referenced above and in my capacity as AirNav Ireland Air Navigation Service Provider (ANSP) Manager Airspace and Navigation, I have considered the location and proposed cranage in the development of this project. Specifically, the received ASAP s.r.o. Codling Wind Park Dublin Airport Special Aeronautical Study, has been reviewed and accepted.

AirNav Ireland are responsible for the safeguarding of Instrument Flight Procedures (IFPs) serving Dublin Airport. Based on the information provided in regard to this development, we have no concerns or required mitigations that would prevent the development proceeding.

AirNav Ireland also have no concerns for the Communication, Navigation and Surveillance (CNS) facilities we manage, in relation to this development.

daa (copied) with whom we liaise on these planning items, are responsible for the Obstacle Limitation Surfaces (OLS) at Dublin Airport. Following our meeting with daa this morning, I can confirm that there are no issues for daa. *Please treat this letter as representing their position also.*

I may be contacted for any clarification if required, as follows:

Email: [redacted]
Mobile:

Cathal Mac Criostail
AirNav Ireland Manager Airspace and Navigation

23rd October 2025
cc. Paul Cumiskey, Gary Mackin, daa
AirNav Ireland Corporate Affairs, Planning

Bord Stiúrthóirí / Board of Directors
Bryan Bourke (Chairman), Gerald Caffrey (Chief Executive), Cian Blackwell, Anne Bradley, Lourda Moloney, Emer Murray, James O'Loughlin, Eimer O'Rourke, Aidan Skelly.

Registered Office:
The Times Building, 11–12 D'Olier Street
Dublin 2, D02 T449, Ireland
Registered No. 734291 Registered in Ireland
A Designated Activity Company

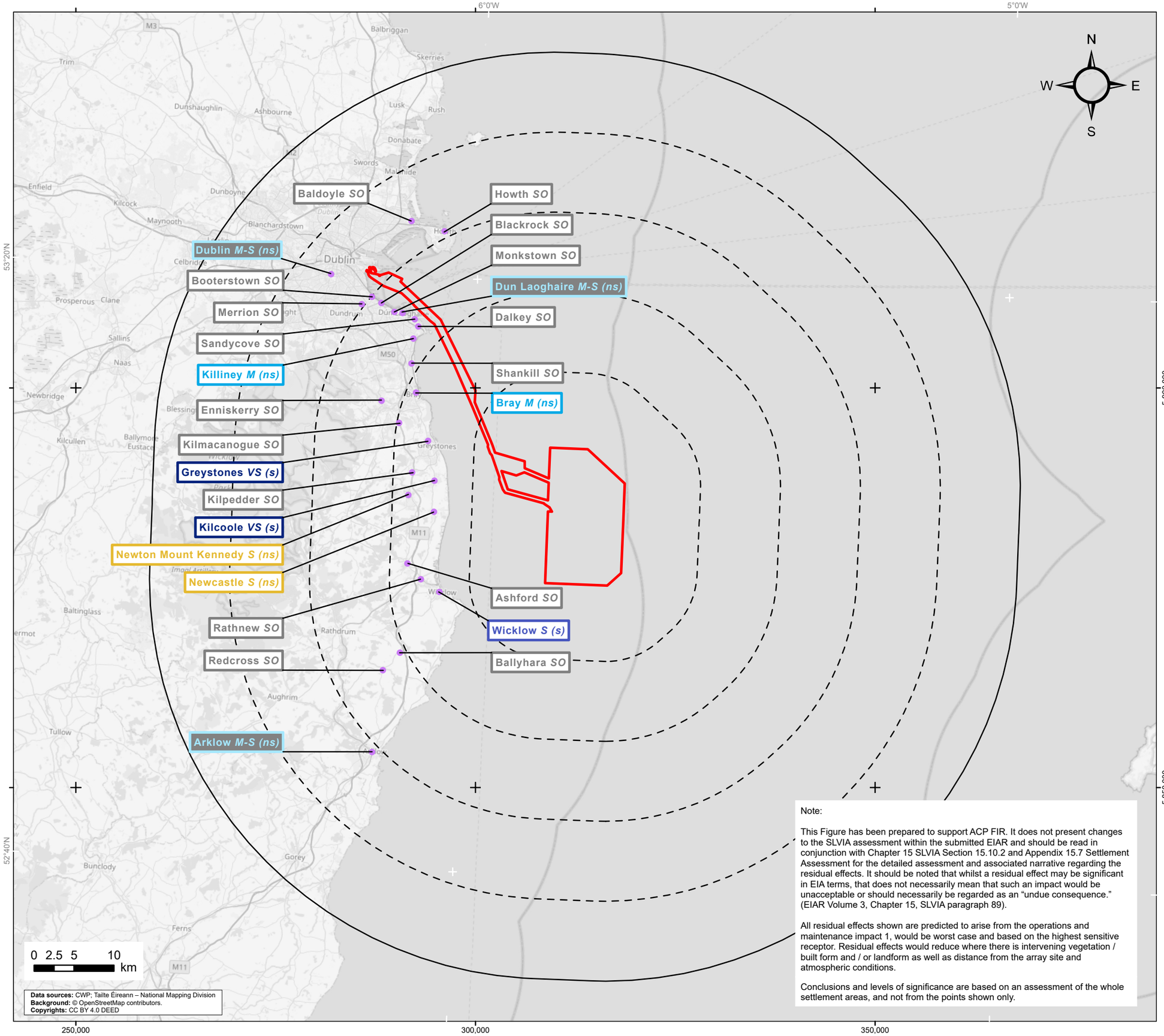
Oifig Chláraithe:
Foirgneamh na hAmanna, 11–12 Sráid D'Olier
Baile Atha Cliath 2, D02 T449, Éire
Uimhir Chláraithe: 734291. Áit Chláraithe: Éire
Cuideachta Ghníomhaíochta Ainmnithe



codling wind park

FIR Response Document

Appendix O - SLVIA additional maps



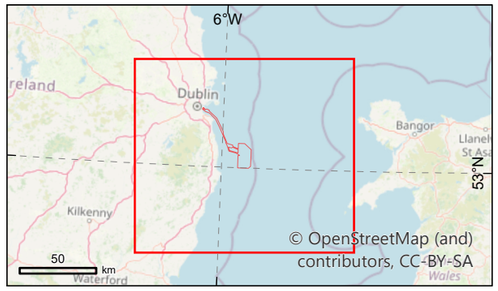
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Background: © OpenStreetMap contributors.
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Note:

This Figure has been prepared to support ACP FIR. It does not present changes to the SLVIA assessment within the submitted EIAR and should be read in conjunction with Chapter 15 SLVIA Section 15.10.2 and Appendix 15.7 Settlement Assessment for the detailed assessment and associated narrative regarding the residual effects. It should be noted that whilst a residual effect may be significant in EIA terms, that does not necessarily mean that such an impact would be unacceptable or should necessarily be regarded as an "undue consequence." (EIAR Volume 3, Chapter 15, SLVIA paragraph 89).

All residual effects shown are predicted to arise from the operations and maintenance impact 1, would be worst case and based on the highest sensitive receptor. Residual effects would reduce where there is intervening vegetation / built form and / or landform as well as distance from the array site and atmospheric conditions.

Conclusions and levels of significance are based on an assessment of the whole settlement areas, and not from the points shown only.



- Planning Application Boundary (PAB)
- SLVIA study area (50 km buffer of the array site / wind farm site)
- 10 km incremental buffers of array site / wind farm site
- Settlements (refer to Main Named Settlements in Appendix 15.8)

Significance of Effect

- Very significant (significant) / VS (s)
- Significant (significant) / S (s)
- Moderate (not significant) / M (ns)
- Moderate-Slight (not significant) / M-S (ns)
- Slight (not significant) / S (ns)
- Scoped out / SO

codling wind park

Project: Codling Wind Park

Contractor: LDA DESIGN www.lda-design.co.uk

Figure 1: Summary of Residual Effects associated with Settlements

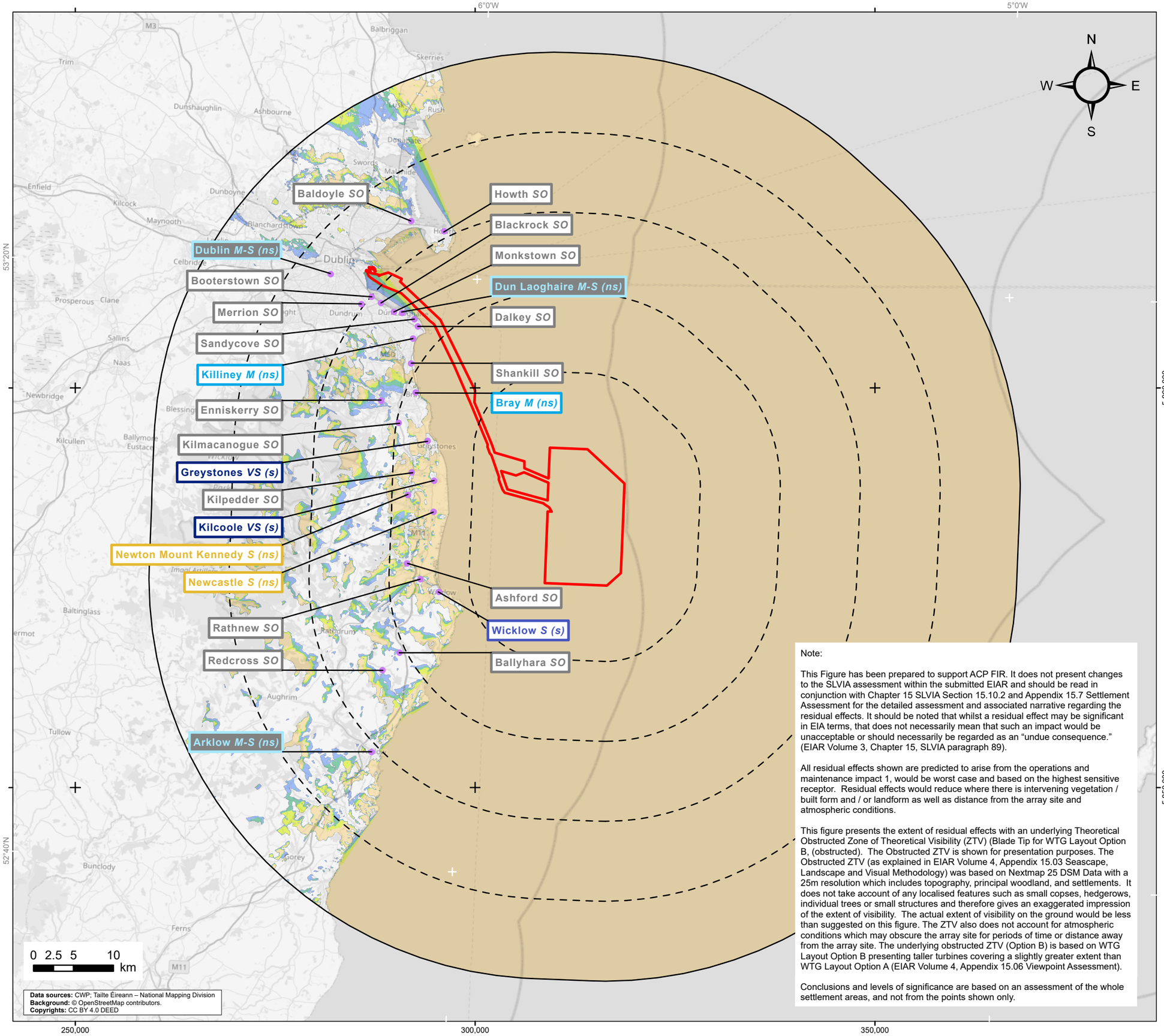
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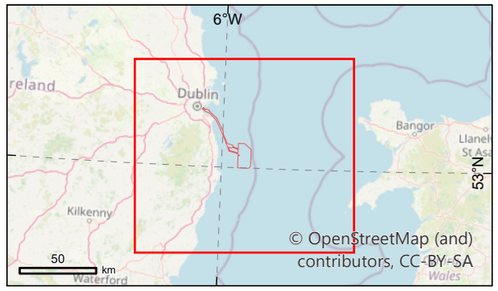
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Rev.	Description	Date	By	Chk'd	App'd
A	First issue	2026/01/06	SG	KSo	MBo





Planning Application Boundary (PAB)

SLVIA study area (50 km buffer of the array site / wind farm site)

10 km incremental buffers of array site / wind farm site

Settlements (refer to Main Named Settlements in Appendix 15.8)

Significance of Effect

- Very significant (significant) / VS (s)
- Significant (significant) / S (s)
- Moderate (not significant) / M (ns)
- Moderate-Slight (not significant) / M-S (ns)
- Slight (not significant) / S (ns)
- Scoped out / SO

Blade tip height Zone of Theoretical Visibility (ZTV) (obstructed)

Number of turbines theoretically visible to blade tip height:

- 1 - 15
- 15 - 30
- 30 - 45
- 45 - 60
- No theoretical visibility

Note:

This Figure has been prepared to support ACP FIR. It does not present changes to the SLVIA assessment within the submitted EIAR and should be read in conjunction with Chapter 15 SLVIA Section 15.10.2 and Appendix 15.7 Settlement Assessment for the detailed assessment and associated narrative regarding the residual effects. It should be noted that whilst a residual effect may be significant in EIA terms, that does not necessarily mean that such an impact would be unacceptable or should necessarily be regarded as an "undue consequence." (EIAR Volume 3, Chapter 15, SLVIA paragraph 89).

All residual effects shown are predicted to arise from the operations and maintenance impact 1, would be worst case and based on the highest sensitive receptor. Residual effects would reduce where there is intervening vegetation / built form and / or landform as well as distance from the array site and atmospheric conditions.

This figure presents the extent of residual effects with an underlying Theoretical Obstructed Zone of Theoretical Visibility (ZTV) (Blade Tip for WTG Layout Option B, (obstructed). The Obstructed ZTV is shown for presentation purposes. The Obstructed ZTV (as explained in EIAR Volume 4, Appendix 15.03 Seascape, Landscape and Visual Methodology) was based on Nextmap 25 DSM Data with a 25m resolution which includes topography, principal woodland, and settlements. It does not take account of any localised features such as small copses, hedgerows, individual trees or small structures and therefore gives an exaggerated impression of the extent of visibility. The actual extent of visibility on the ground would be less than suggested on this figure. The ZTV also does not account for atmospheric conditions which may obscure the array site for periods of time or distance away from the array site. The underlying obstructed ZTV (Option B) is based on WTG Layout Option B presenting taller turbines covering a slightly greater extent than WTG Layout Option A (EIAR Volume 4, Appendix 15.06 Viewpoint Assessment).

Conclusions and levels of significance are based on an assessment of the whole settlement areas, and not from the points shown only.

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Project: Codling Wind Park

Contractor: LDĀDESIGN www.lda-design.co.uk

Figure 1a: Summary of residual effects associated with Settlements with Theoretical Obstructed ZTV (Blade tip for Option B)

CWP doc. number: CWP-LDA-ENG-08-01-MAP-2014

Internal descriptive code:

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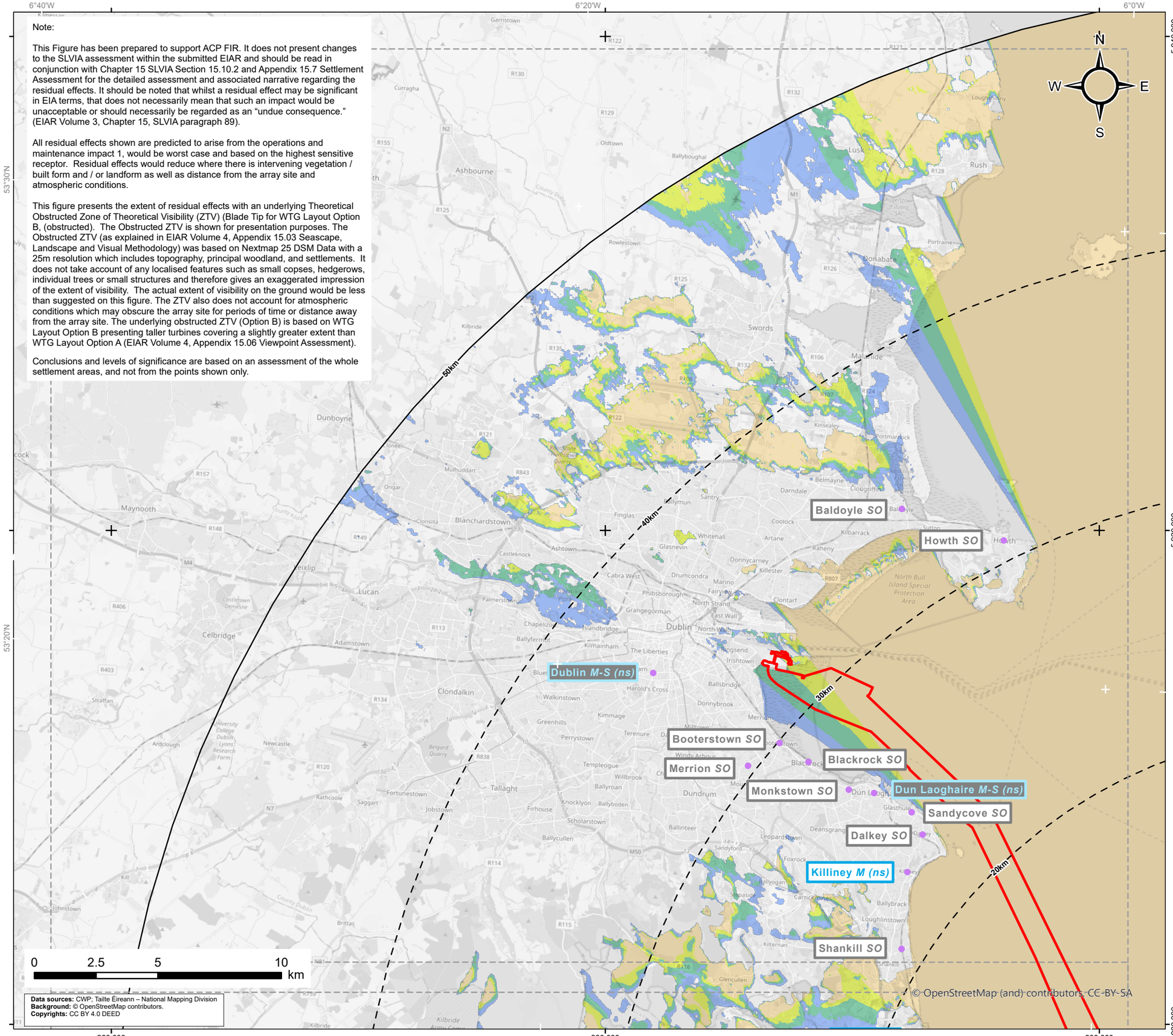
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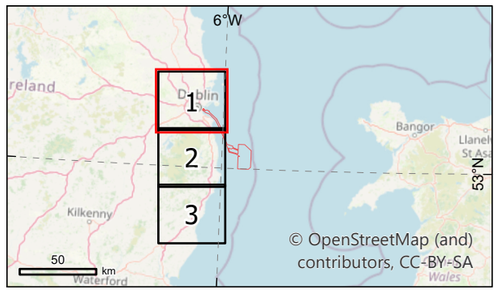
This Figure has been prepared to support ACP FIR. It does not present changes to the SLVIA assessment within the submitted EIAR and should be read in conjunction with Chapter 15 SLVIA Section 15.10.2 and Appendix 15.7 Settlement Assessment for the detailed assessment and associated narrative regarding the residual effects. It should be noted that whilst a residual effect may be significant in EIA terms, that does not necessarily mean that such an impact would be unacceptable or should necessarily be regarded as an "undue consequence." (EIAR Volume 3, Chapter 15, SLVIA paragraph 89).

All residual effects shown are predicted to arise from the operations and maintenance impact 1, would be worst case and based on the highest sensitive receptor. Residual effects would reduce where there is intervening vegetation / built form and / or landform as well as distance from the array site and atmospheric conditions.

This figure presents the extent of residual effects with an underlying Theoretical Obstructed Zone of Theoretical Visibility (ZTV) (Blade Tip for WTG Layout Option B, (obstructed). The Obstructed ZTV is shown for presentation purposes. The Obstructed ZTV (as explained in EIAR Volume 4, Appendix 15.03 Seascape, Landscape and Visual Methodology) was based on Nextmap 25 DSM Data with a 25m resolution which includes topography, principal woodland, and settlements. It does not take account of any localised features such as small copses, hedgerows, individual trees or small structures and therefore gives an exaggerated impression of the extent of visibility. The actual extent of visibility on the ground would be less than suggested on this figure. The ZTV also does not account for atmospheric conditions which may obscure the array site for periods of time or distance away from the array site. The underlying obstructed ZTV (Option B) is based on WTG Layout Option B presenting taller turbines covering a slightly greater extent than WTG Layout Option A (EIAR Volume 4, Appendix 15.06 Viewpoint Assessment).

Conclusions and levels of significance are based on an assessment of the whole settlement areas, and not from the points shown only.





- Planning Application Boundary (PAB)
- SLVIA study area (50 km buffer of the array site / wind farm site)
- 10 km incremental buffers of array site / wind farm site
- Settlements (refer to Main Named Settlements in Appendix 15.8)

Significance of Effect
- Very significant (significant) / VS (s)
- Significant (significant) / S (s)
- Moderate (not significant) / M (ns)
- Moderate-Slight (not significant) / M-S (ns)
- Slight (not significant) / S (ns)
- Scoped out / SO

Blade tip height Zone of Theoretical Visibility (ZTV) (obstructed)

Number of turbines theoretically visible to blade tip height:
- 1 - 15
- 15 - 30
- 30 - 45
- 45 - 60
- No theoretical visibility

Data sources: CWP; Tailte Éireann – National Mapping Division
Background: © OpenStreetMap contributors.
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Project: Codling Wind Park

Contractor: LDĀDESIGN www.lda-design.co.uk

Figure 1b: Summary of residual effects associated with Settlements with Theoretical Obstructed ZTV (Blade Tip for Option B) - North

Page 1 of 3

CWP doc. number: CWP-LDA-ENG-08-01-MAP-2015

Internal descriptive code:

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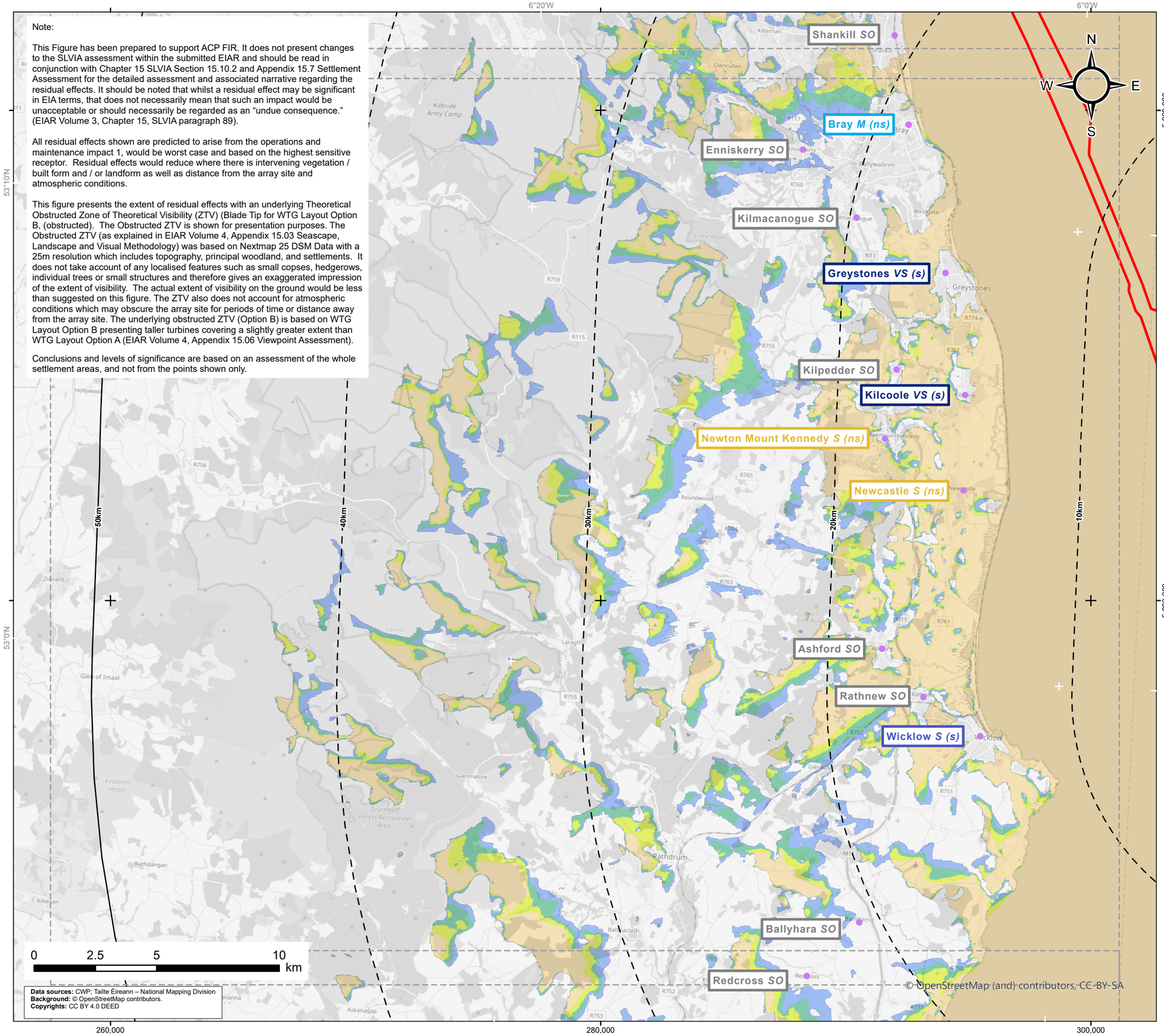
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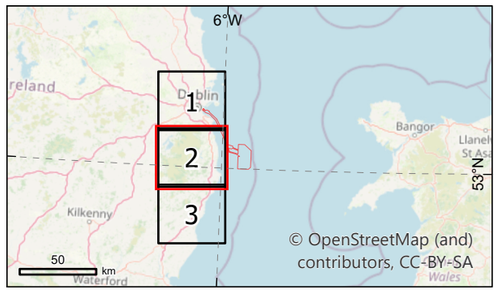
This Figure has been prepared to support ACP FIR. It does not present changes to the SLVIA assessment within the submitted EIAR and should be read in conjunction with Chapter 15 SLVIA Section 15.10.2 and Appendix 15.7 Settlement Assessment for the detailed assessment and associated narrative regarding the residual effects. It should be noted that whilst a residual effect may be significant in EIA terms, that does not necessarily mean that such an impact would be unacceptable or should necessarily be regarded as an "undue consequence." (EIAR Volume 3, Chapter 15, SLVIA paragraph 89).

All residual effects shown are predicted to arise from the operations and maintenance impact 1, would be worst case and based on the highest sensitive receptor. Residual effects would reduce where there is intervening vegetation / built form and / or landform as well as distance from the array site and atmospheric conditions.

This figure presents the extent of residual effects with an underlying Theoretical Obstructed Zone of Theoretical Visibility (ZTV) (Blade Tip for WTG Layout Option B, (obstructed). The Obstructed ZTV is shown for presentation purposes. The Obstructed ZTV (as explained in EIAR Volume 4, Appendix 15.03 Seascape, Landscape and Visual Methodology) was based on Nextmap 25 DSM Data with a 25m resolution which includes topography, principal woodland, and settlements. It does not take account of any localised features such as small copses, hedgerows, individual trees or small structures and therefore gives an exaggerated impression of the extent of visibility. The actual extent of visibility on the ground would be less than suggested on this figure. The ZTV also does not account for atmospheric conditions which may obscure the array site for periods of time or distance away from the array site. The underlying obstructed ZTV (Option B) is based on WTG Layout Option B presenting taller turbines covering a slightly greater extent than WTG Layout Option A (EIAR Volume 4, Appendix 15.06 Viewpoint Assessment).

Conclusions and levels of significance are based on an assessment of the whole settlement areas, and not from the points shown only.





- Planning Application Boundary (PAB)
- SLVIA study area (50 km buffer of the array site / wind farm site)
- 10 km incremental buffers of array site / wind farm site
- Settlements (refer to Main Named Settlements in Appendix 15.8)

Significance of Effect

- Very significant (significant) / VS (s)
- Significant (significant) / S (s)
- Moderate (not significant) / M (ns)
- Moderate-Slight (not significant) / M-S (ns)
- Slight (not significant) / S (ns)
- Scoped out / SO

Blade tip height Zone of Theoretical Visibility (ZTV) (obstructed)

Number of turbines theoretically visible to blade tip height:

- 1 - 15
- 15 - 30
- 30 - 45
- 45 - 60
- No theoretical visibility

codling wind park

Project: Codling Wind Park

Contractor: LDA DESIGN www.lda-design.co.uk

Figure 1c: Summary of residual effects associated with Settlements with Theoretical Obstructed ZTV (Blade Tip for Option B) - Central

Page 2 of 3

CWP doc. number: CWP-LDA-ENG-08-01-MAP-2016

Internal descriptive code:

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Rev.	Description	Date	By	Chk'd	App'd
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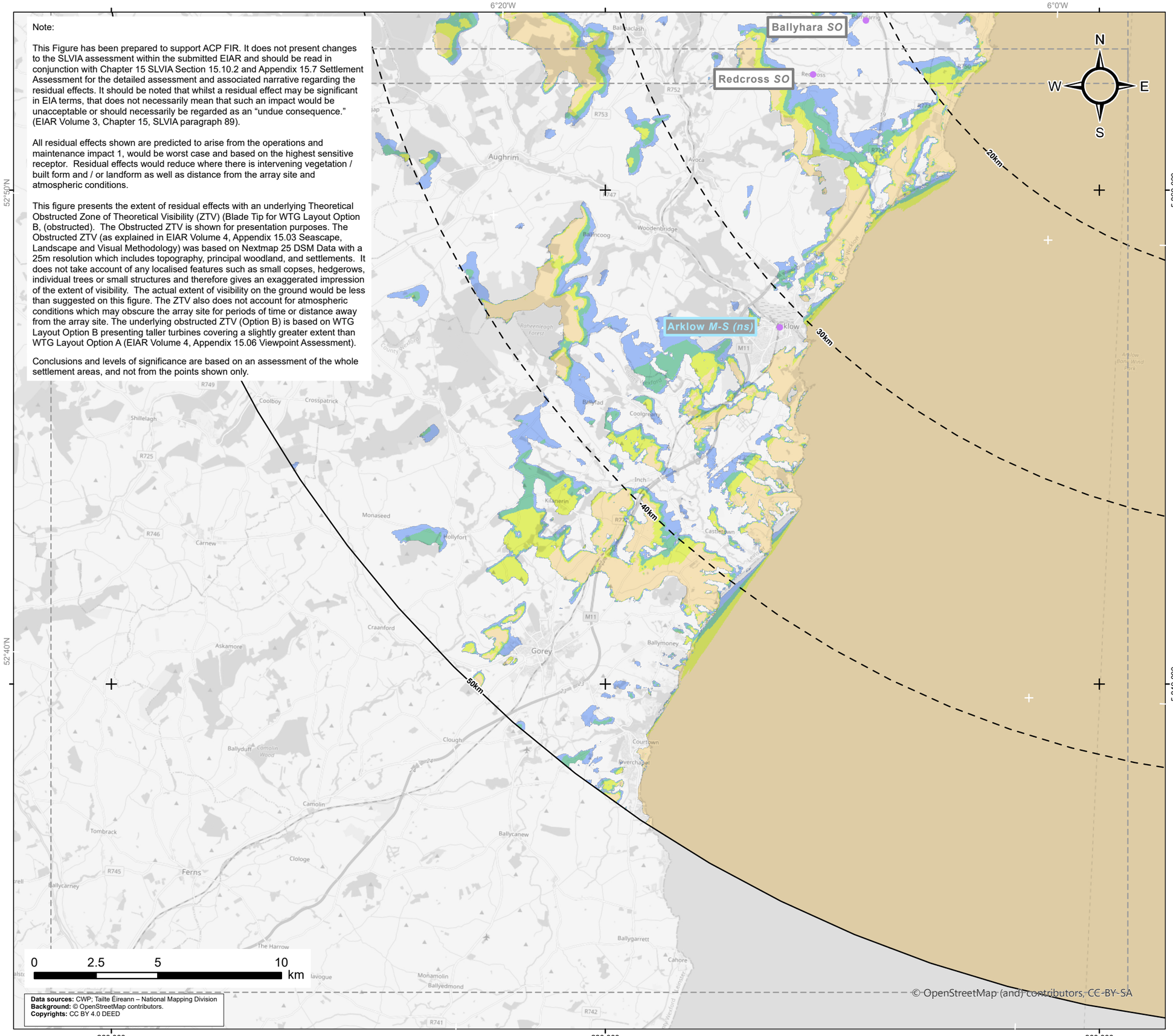
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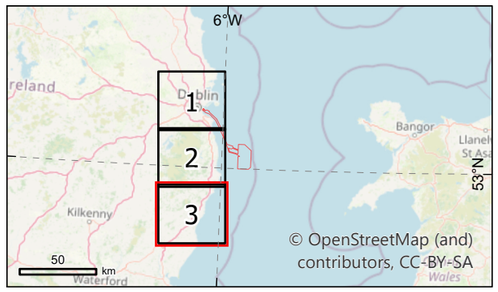
This Figure has been prepared to support ACP FIR. It does not present changes to the SLVIA assessment within the submitted EIAR and should be read in conjunction with Chapter 15 SLVIA Section 15.10.2 and Appendix 15.7 Settlement Assessment for the detailed assessment and associated narrative regarding the residual effects. It should be noted that whilst a residual effect may be significant in EIA terms, that does not necessarily mean that such an impact would be unacceptable or should necessarily be regarded as an "undue consequence." (EIAR Volume 3, Chapter 15, SLVIA paragraph 89).

All residual effects shown are predicted to arise from the operations and maintenance impact 1, would be worst case and based on the highest sensitive receptor. Residual effects would reduce where there is intervening vegetation / built form and / or landform as well as distance from the array site and atmospheric conditions.

This figure presents the extent of residual effects with an underlying Theoretical Obstructed Zone of Theoretical Visibility (ZTV) (Blade Tip for WTG Layout Option B, (obstructed). The Obstructed ZTV is shown for presentation purposes. The Obstructed ZTV (as explained in EIAR Volume 4, Appendix 15.03 Seascape, Landscape and Visual Methodology) was based on Nextmap 25 DSM Data with a 25m resolution which includes topography, principal woodland, and settlements. It does not take account of any localised features such as small copses, hedgerows, individual trees or small structures and therefore gives an exaggerated impression of the extent of visibility. The actual extent of visibility on the ground would be less than suggested on this figure. The ZTV also does not account for atmospheric conditions which may obscure the array site for periods of time or distance away from the array site. The underlying obstructed ZTV (Option B) is based on WTG Layout Option B presenting taller turbines covering a slightly greater extent than WTG Layout Option A (EIAR Volume 4, Appendix 15.06 Viewpoint Assessment).

Conclusions and levels of significance are based on an assessment of the whole settlement areas, and not from the points shown only.





- Planning Application Boundary (PAB)
- SLVIA study area (50 km buffer of the array site / wind farm site)
- 10 km incremental buffers of array site / wind farm site
- Settlements (refer to Main Named Settlements in Appendix 15.8)

Significance of Effect

- Very significant (significant) / VS (s)
- Significant (significant) / S (s)
- Moderate (not significant) / M (ns)
- Moderate-Slight (not significant) / M-S (ns)
- Slight (not significant) / S (ns)
- Scoped out / SO

Blade tip height Zone of Theoretical Visibility (ZTV) (obstructed)

Number of turbines theoretically visible to blade tip height:

- 1 - 15
- 15 - 30
- 30 - 45
- 45 - 60
- No theoretical visibility

codling wind park

Project: Codling Wind Park

Contractor: LDĀDESIGN www.lda-design.co.uk

Figure 1d: Summary of residual effects associated with Settlements with Theoretical Obstructed ZTV (Blade Tip for Option B) - South

CWP doc. number: CWP-LDA-ENG-08-01-MAP-2017

Internal descriptive code:

Size: A3 *Scale:* 1:150,000

CRS: EPSG 25830

Rev.	Description	Date	By	Chk'd	App'd
A	First issue	2026/01/06	SG	KSo	MBo

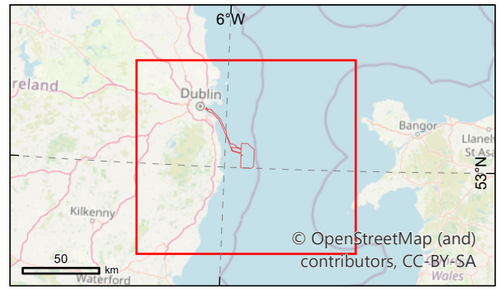
Note:

This Figure has been prepared to support ACP FIR. It does not present changes to the SLVIA assessment within the submitted EIAR and should be read in conjunction with Appendix 15.6 Viewpoint Assessment for the detailed assessment and associated narrative regarding the residual effects. It should be noted that whilst a residual effect may be significant in EIA terms, that does not necessarily mean that such an impact would be unacceptable or should necessarily be regarded as an "undue consequence." (EIAR Volume 3, Chapter 15, SLVIA paragraph 89).

All residual effects shown are predicted to arise from the operations and maintenance impact 1, would be worst case and based on the highest sensitive receptor. Residual effects would reduce where there is intervening vegetation / built form and / or landform as well as distance from the array site and atmospheric conditions.

VP No.	Viewpoint Title	Effect
1	Howth Summit	M (ns)
2	North Bull Island	M (ns)
3	Greater South Wall, Poolbeg	M-S (ns)
4	Dun Laoghaire, East Pier	M-S (ns)
5	Kiliney Hill, Obelisk	M (ns)
6	Carrickgollogan Hill	M (ns)
7	Bray Promenade	M (ns)
8	Bray Head	S (s)
9	Great Sugar Loaf	S (s)
10	Greystones	VS (s)
11	Kilcoole Beach	VS (s)
12	Six Mile Point	VS (s)
13	Wicklow Town Harbour	S (s)
14	Djouce Mountain	M (ns)
15	Brockagh Mountain	M (ns)
16	Wicklow Lighthouse	SO

VP No.	Viewpoint Title	Effect
17	Blainroe Golf Club / Beach	SO
18	Brittas Bay	M (ns)
19	Arklow Pier (south side)	M-S (ns)
20	Kilmichael Point	S (ns)
21	Shankill Beach	M (ns)
22	Three Rock Mountain	M (ns)
23	Maheramore Beach	S (s)
24	Kilcoole Rock	VS (s)
25	Greystone Football Club	SO
26	Greystones Beach Bear	VS (s)
27	Greystone The Cove	SO
28	Greystones The Marine Village Park	SO
29	Greystones Redford Cemetery	SO
30	Greystone Golf Course	SO
31	Charlesand	SO



- Planning Application Boundary (PAB)
- SLVIA study area (50 km buffer of the array site / wind farm site)
- 10 km incremental buffers of array site / wind farm site
- Viewpoints selected for the SLVIA
- Viewpoints selected but scoped out of the SLVIA based on issues with public access (viewpoint 16/17)
- Viewpoints selected but scoped out of the SLVIA on the basis that the views were either not publicly accessible and/or reflected a similar angle of view and visual receptor group to the viewpoints already chosen (Greystones 25, 27-31 omitted.)

Significance of Effect

- Very significant (significant) / VS (s)
- Significant (significant) / S (s)
- Moderate (not significant) / M (ns)
- Moderate-Slight (not significant) / M-S (ns)
- Slight (not significant) / S (ns)
- Scoped out / SO

0 2.5 5 10 km

Data sources: CWP; Tailte Éireann – National Mapping Division
Background: © OpenStreetMap contributors.
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codling wind park

Project: Codling Wind Park

Contractor: LDĀDESIGN www.lda-design.co.uk

Figure 2: Summary of residual effects associated with Onshore Viewpoints

CWP doc. number: CWP-LDA-ENG-08-01-MAP-2018

Internal descriptive code:

Size: A3 *Scale:* 1:460,000

CRS: EPSG 25830

Rev.	Description	Date	By	Chk'd	App'd
A	First issue	2026/01/06	SG	KSo	MBo

Note:

This Figure has been prepared to support ACP FIR. It does not present changes to the SLVIA assessment within the submitted EIAR and should be read in conjunction with Appendix 15.6 Viewpoint Assessment for the detailed assessment and associated narrative regarding the residual effects. It should be noted that whilst a residual effect may be significant in EIA terms, that does not necessarily mean that such an impact would be unacceptable or should necessarily be regarded as an "undue consequence." (EIAR Volume 3, Chapter 15, SLVIA paragraph 89).

All residual effects shown are predicted to arise from the operations and maintenance impact 1, would be worst case and based on the highest sensitive receptor. Residual effects would reduce where there is intervening vegetation / built form and / or landform as well as distance from the array site and atmospheric conditions.

VP No.	Viewpoint Title	Effect
1	Howth Summit	M (ns)
2	North Bull Island	M (ns)
3	Greater South Wall, Poolbeg	M-S (ns)
4	Dun Laoghaire, East Pier	M-S (ns)
5	Kiliney Hill, Obelisk	M (ns)
6	Carrickgollogan Hill	M (ns)
7	Bray Promenade	M (ns)
8	Bray Head	S (s)
9	Great Sugar Loaf	S (s)
10	Greystones	VS (s)
11	Kilcoole Beach	VS (s)
12	Six Mile Point	VS (s)
13	Wicklow Town Harbour	S (s)
14	Djouce Mountain	M (ns)
15	Brockagh Mountain	M (ns)
16	Wicklow Lighthouse	SO

VP No.	Viewpoint Title	Effect
17	Blainroe Golf Club / Beach	SO
18	Brittas Bay	M (ns)
19	Arklow Pier (south side)	M-S (ns)
20	Kilmichael Point	S (ns)
21	Shankill Beach	M (ns)
22	Three Rock Mountain	M (ns)
23	Maheramore Beach	S (s)
24	Kilcoole Rock	VS (s)
25	Greystone Football Club	SO
26	Greystones Beach Bear	VS (s)
27	Greystone The Cove	SO
28	Greystones The Marine Village Park	SO
29	Greystones Redford Cemetery	SO
30	Greystone Golf Course	SO
31	Charlesand	SO

This figure presents the extent of residual effects with an underlying Theoretical Obstructed Zone of Theoretical Visibility (ZTV) (Blade Tip for WTG Layout Option B, (obstructed). The Obstructed ZTV is shown for presentation purposes. The Obstructed ZTV (as explained in EIAR Volume 4, Appendix 15.03 Seascape, Landscape and Visual Methodology) was based on Nextmap 25 DSM Data with a 25m resolution which includes topography, principal woodland, and settlements. It does not take account of any localised features such as small copses, hedgerows, individual trees or small structures and therefore gives an exaggerated impression of the extent of visibility. The actual extent of visibility on the ground would be less than suggested on this figure. The ZTV also does not account for atmospheric conditions which may obscure the array site for periods of time or distance away from the array site. The underlying obstructed ZTV (Option B) is based on WTG Layout Option B presenting taller turbines covering a slightly greater extent than WTG Layout Option A (EIAR Volume 4, Appendix 15.06 Viewpoint Assessment).

0 2.5 5 10 km

0 0.5 1 km

Data sources: CWP; Tailte Éireann – National Mapping Division
Background: © OpenStreetMap contributors.
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- Planning Application Boundary (PAB)
- SLVIA study area (50 km buffer of the array site / wind farm site)
- 10 km incremental buffers of array site / wind farm site
- Viewpoints selected for the SLVIA
- Viewpoints selected but scoped out of the SLVIA based on issues with public access (viewpoint 16/17)
- Viewpoints selected but scoped out of the SLVIA on the basis that the views were either not publicly accessible and/or reflected a similar angle of view and visual receptor group to the viewpoints already chosen (Greystones 25, 27-31 omitted.)

Significance of Effect

- Very significant (significant) / VS (s)
- Significant (significant) / S (s)
- Moderate (not significant) / M (ns)
- Moderate-Slight (not significant) / M-S (ns)
- Slight (not significant) / S (ns)
- Scoped out / SO

Blade tip height Zone of Theoretical Visibility (ZTV) (obstructed)

Number of turbines theoretically visible to blade tip height:

- 1 - 15
- 15 - 30
- 30 - 45
- 45 - 60
- No theoretical visibility

codling wind park

Project: Codling Wind Park

Contractor: LDĀDESIGN www.lda-design.co.uk

Figure 2a: Summary of residual effects associated with Onshore Viewpoints with Theoretical Obstructed ZTV (Blade Tip for Option B)

CWP doc. number: CWP-LDA-ENG-08-01-MAP-2019

Internal descriptive code:

Size: A3 *Scale:* 1:460,000

CRS: EPSG 25830

Rev.	Description	Date	By	Chk'd	App'd
A	First issue	2026/01/06	SG	KSo	MBo

Note:

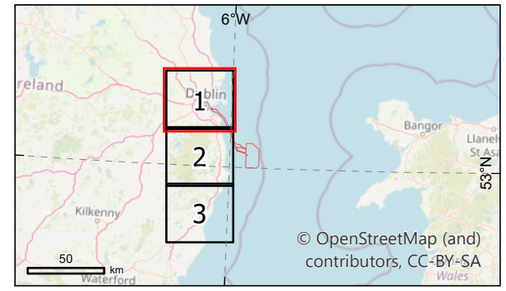
This Figure has been prepared to support ACP FIR. It does not present changes to the SLVIA assessment within the submitted EIAR and should be read in conjunction with Appendix 15.6 Viewpoint Assessment for the detailed assessment and associated narrative regarding the residual effects. It should be noted that whilst a residual effect may be significant in EIA terms, that does not necessarily mean that such an impact would be unacceptable or should necessarily be regarded as an "undue consequence." (EIAR Volume 3, Chapter 15, SLVIA paragraph 89).

All residual effects shown are predicted to arise from the operations and maintenance impact 1, would be worst case and based on the highest sensitive receptor. Residual effects would reduce where there is intervening vegetation / built form and / or landform as well as distance from the array site and atmospheric conditions.

This figure presents the extent of residual effects with an underlying Theoretical Obstructed Zone of Theoretical Visibility (ZTV) (Blade Tip for WTG Layout Option B, (obstructed). The Obstructed ZTV is shown for presentation purposes. The Obstructed ZTV (as explained in EIAR Volume 4, Appendix 15.03 Seascape, Landscape and Visual Methodology) was based on Nextmap 25 DSM Data with a 25m resolution which includes topography, principal woodland, and settlements. It does not take account of any localised features such as small copses, hedgerows, individual trees or small structures and therefore gives an exaggerated impression of the extent of visibility. The actual extent of visibility on the ground would be less than suggested on this figure. The ZTV also does not account for atmospheric conditions which may obscure the array site for periods of time or distance away from the array site. The underlying obstructed ZTV (Option B) is based on WTG Layout Option B presenting taller turbines covering a slightly greater extent than WTG Layout Option A (EIAR Volume 4, Appendix 15.06 Viewpoint Assessment).

VP	VP_Title	Effect
1	Howth Summit	M (ns)
2	North Bull Island	M (ns)
3	Greater South Wall, Poolbeg	M-S (ns)
4	Dun Laoghaire, East Pier	M-S (ns)
5	Kiliney Hill, Obelisk	M (ns)
6	Carrickgollogan Hill	M (ns)
7	Bray Promenade	M (ns)
8	Bray Head	S (s)
9	Great Sugar Loaf	S (s)
10	Greystones	VS (s)
11	Kilcoole Beach	VS (s)
12	Six Mile Point	VS (s)
13	Wicklow Town Harbour	S (s)
14	Djouce Mountain	M (ns)
15	Brockagh Mountain	M (ns)
16	Wicklow Lighthouse	SO

VP	VP_Title	Effect
17	Blainroe Golf Club / Beach	SO
18	Brittas Bay	M (ns)
19	Arklow Pier (south side)	M-S (ns)
20	Kilmichael Point	S (ns)
21	Shankill Beach	M (ns)
22	Three Rock Mountain	M (ns)
23	Maheramore Beach	S (s)
24	Kilcoole Rock	VS (s)
25	Greystone Football Club	SO
26	Greystones Beach Bear	VS (s)
27	Greystone The Cove	SO
28	Greystones The Marine Village Park	SO
29	Greystones Redford Cemetery	SO
30	Greystone Golf Course	SO
31	Charlesand	SO



- Planning Application Boundary (PAB)
- SLVIA study area (50 km buffer of the array site / wind farm site)
- 10 km incremental buffers of array site / wind farm site
- Viewpoints selected for the SLVIA
- Viewpoints selected but scoped out of the SLVIA based on issues with public access (viewpoint 16/17)
- Viewpoints selected but scoped out of the SLVIA on the basis that the views were either not publicly accessible and/or reflected a similar angle of view and visual receptor group to the viewpoints already chosen (Greystones 25, 27-31 omitted.)

Significance of Effect

- Very significant (significant) / VS (s)
- Significant (significant) / S (s)
- Moderate (not significant) / M (ns)
- Moderate-Slight (not significant) / M-S (ns)
- Slight (not significant) / S (ns)
- Scoped out / SO

Blade tip height Zone of Theoretical Visibility (ZTV) (obstructed)

Number of turbines theoretically visible to blade tip height:

- 1 - 15
- 15 - 30
- 30 - 45
- 45 - 60
- No theoretical visibility

0 2.5 5 10 km

Data sources: CWP; Tailte Éireann – National Mapping Division
Background: © OpenStreetMap contributors.
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6°40'W 6°20'W 6°0'W 53°30'N 53°20'N 5,940,000 5,920,000 5,900,000 260,000 280,000 300,000

codling wind park

Project: Codling Wind Park

Contractor: LDA DESIGN www.lda-design.co.uk

Figure 2b: Summary of residual effects associated with Onshore Viewpoints with Theoretical Obstructed ZTV (Blade Tip for Option B) - North

CWP doc. number: CWP-LDA-ENG-08-01-MAP-2020

Internal descriptive code:

Size: A3 *Scale:* 1:150,000 *CRS:* EPSG 25830

Rev.	Description	Date	By	Chk'd	App'd
A	First issue	2026/01/06	SG	KSo	MBo

Note:

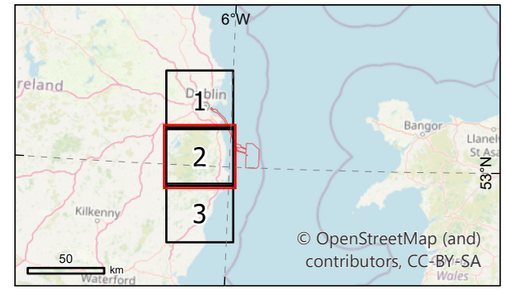
This Figure has been prepared to support ACP FIR. It does not present changes to the SLVIA assessment within the submitted EIAR and should be read in conjunction with Appendix 15.6 Viewpoint Assessment for the detailed assessment and associated narrative regarding the residual effects. It should be noted that whilst a residual effect may be significant in EIA terms, that does not necessarily mean that such an impact would be unacceptable or should necessarily be regarded as an "undue consequence." (EIAR Volume 3, Chapter 15, SLVIA paragraph 89).

All residual effects shown are predicted to arise from the operations and maintenance impact 1, would be worst case and based on the highest sensitive receptor. Residual effects would reduce where there is intervening vegetation / built form and / or landform as well as distance from the array site and atmospheric conditions.

This figure presents the extent of residual effects with an underlying Theoretical Obstructed Zone of Theoretical Visibility (ZTV) (Blade Tip for WTG Layout Option B, (obstructed). The Obstructed ZTV is shown for presentation purposes. The Obstructed ZTV (as explained in EIAR Volume 4, Appendix 15.03 Seascape, Landscape and Visual Methodology) was based on Nextmap 25 DSM Data with a 25m resolution which includes topography, principal woodland, and settlements. It does not take account of any localised features such as small copses, hedgerows, individual trees or small structures and therefore gives an exaggerated impression of the extent of visibility. The actual extent of visibility on the ground would be less than suggested on this figure. The ZTV also does not account for atmospheric conditions which may obscure the array site for periods of time or distance away from the array site. The underlying obstructed ZTV (Option B) is based on WTG Layout Option B presenting taller turbines covering a slightly greater extent than WTG Layout Option A (EIAR Volume 4, Appendix 15.06 Viewpoint Assessment).

VP	VP_Title	Effect
1	Howth Summit	M (ns)
2	North Bull Island	M (ns)
3	Greater South Wall, Poolbeg	M-S (ns)
4	Dun Laoghaire, East Pier	M-S (ns)
5	Kiliney Hill, Obelisk	M (ns)
6	Carrickgollogan Hill	M (ns)
7	Bray Promenade	M (ns)
8	Bray Head	S (s)
9	Great Sugar Loaf	S (s)
10	Greystones	VS (s)
11	Kilcoole Beach	VS (s)
12	Six Mile Point	VS (s)
13	Wicklow Town Harbour	S (s)
14	Djouce Mountain	M (ns)
15	Brockagh Mountain	M (ns)
16	Wicklow Lighthouse	SO

VP	VP_Title	Effect
17	Blainroe Golf Club / Beach	SO
18	Brittas Bay	M (ns)
19	Arklow Pier (south side)	M-S (ns)
20	Kilmichael Point	S (ns)
21	Shankill Beach	M (ns)
22	Three Rock Mountain	M (ns)
23	Maheramore Beach	S (s)
24	Kilcoole Rock	VS (s)
25	Greystone Football Club	SO
26	Greystones Beach Bear	VS (s)
27	Greystone The Cove	SO
28	Greystones The Marine Village Park	SO
29	Greystones Redford Cemetery	SO
30	Greystone Golf Course	SO
31	Charlesand	SO



- Planning Application Boundary (PAB)
- SLVIA study area (50 km buffer of the array site / wind farm site)
- 10 km incremental buffers of array site / wind farm site
- Viewpoints selected for the SLVIA
- Viewpoints selected but scoped out of the SLVIA based on issues with public access (viewpoint 16/17)
- Viewpoints selected but scoped out of the SLVIA on the basis that the views were either not publicly accessible and/or reflected a similar angle of view and visual receptor group to the viewpoints already chosen (Greystones 25, 27-31 omitted.)

Significance of Effect

- Very significant (significant) / VS (s)
- Significant (significant) / S (s)
- Moderate (not significant) / M (ns)
- Moderate-Slight (not significant) / M-S (ns)
- Slight (not significant) / S (ns)
- Scoped out / SO

Blade tip height Zone of Theoretical Visibility (ZTV) (obstructed)

Number of turbines theoretically visible to blade tip height:

- 1 - 15
- 15 - 30
- 30 - 45
- 45 - 60
- No theoretical visibility

0 2.5 5 10 km

Data sources: CWP; Tailte Éireann – National Mapping Division
Background: © OpenStreetMap contributors.
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codling wind park

Project: Codling Wind Park

Contractor: LDĀDESIGN www.lda-design.co.uk

Figure 2c: Summary of residual effects associated with Onshore Viewpoints with Theoretical Obstructed ZTV (Blade Tip for Option B) - Central

CWP doc. number: CWP-LDA-ENG-08-01-MAP-2021

Internal descriptive code:

Size: A3

Scale: 1:150,000

CRS: EPSG 25830

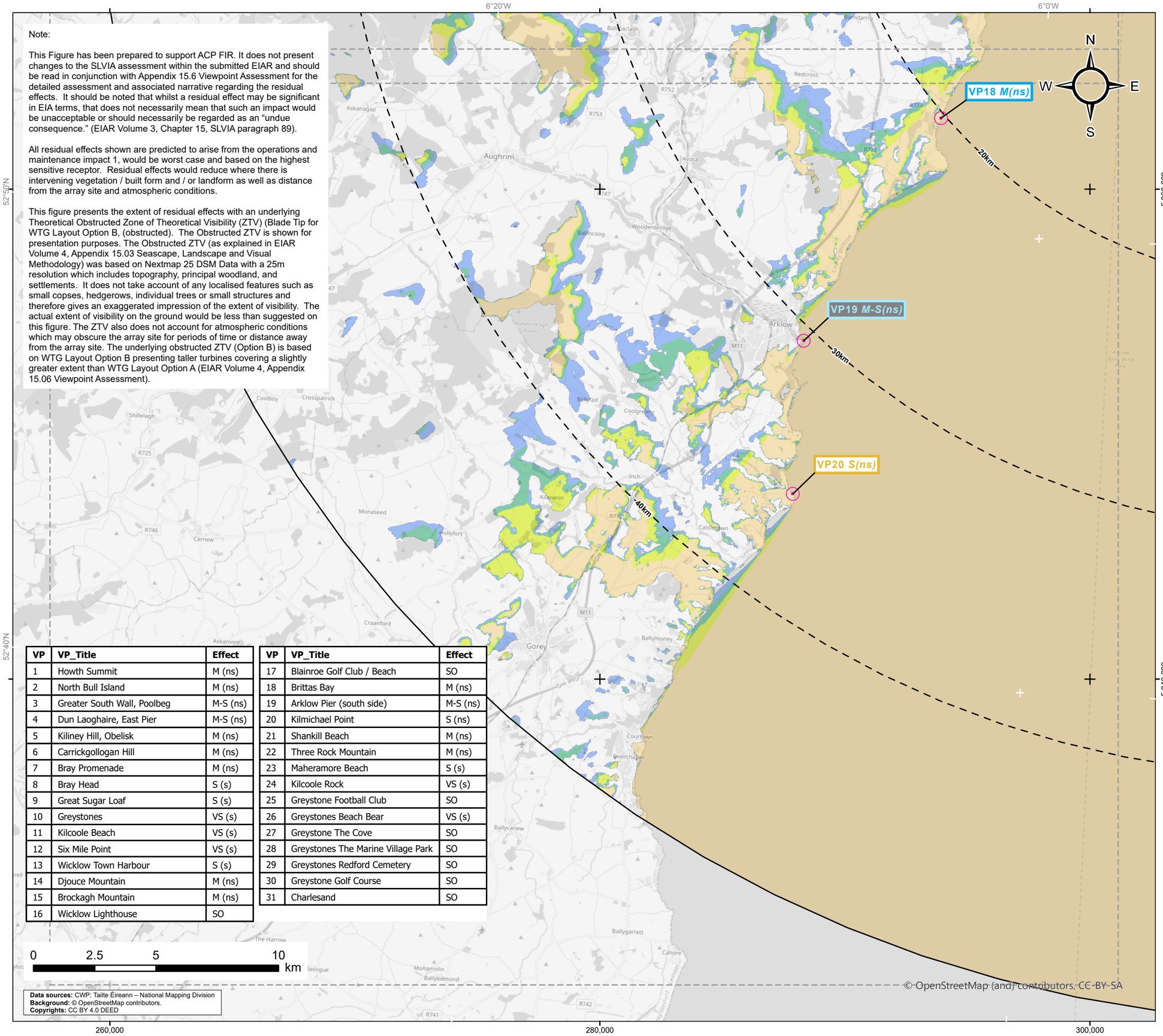
Rev.	Description	Date	By	Chk'd	App'd
A	First issue	2026/01/06	SG	KSo	MBo

Note:

This Figure has been prepared to support ACP FIR. It does not present changes to the SLVIA assessment within the submitted EIAR and should be read in conjunction with Appendix 15.6 Viewpoint Assessment for the detailed assessment and associated narrative regarding the residual effects. It should be noted that whilst a residual effect may be significant in EIA terms, that does not necessarily mean that such an impact would be unacceptable or should necessarily be regarded as an "undue consequence." (EIAR Volume 3, Chapter 15, SLVIA paragraph 89).

All residual effects shown are predicted to arise from the operations and maintenance impact 1, would be worst case and based on the highest sensitive receptor. Residual effects would reduce where there is intervening vegetation / built form and / or landform as well as distance from the array site and atmospheric conditions.

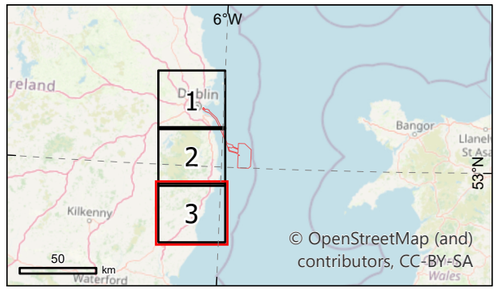
This figure presents the extent of residual effects with an underlying Theoretical Obstructed Zone of Theoretical Visibility (ZTV) (Blade Tip for WTG Layout Option B, (obstructed). The Obstructed ZTV is shown for presentation purposes. The Obstructed ZTV (as explained in EIAR Volume 4, Appendix 15.03 Seascape, Landscape and Visual Methodology) was based on Nextmap 25 DSM Data with a 25m resolution which includes topography, principal woodland, and settlements. It does not take account of any localised features such as small copses, hedgerows, individual trees or small structures and therefore gives an exaggerated impression of the extent of visibility. The actual extent of visibility on the ground would be less than suggested on this figure. The ZTV also does not account for atmospheric conditions which may obscure the array site for periods of time or distance away from the array site. The underlying obstructed ZTV (Option B) is based on WTG Layout Option B presenting taller turbines covering a slightly greater extent than WTG Layout Option A (EIAR Volume 4, Appendix 15.06 Viewpoint Assessment).



VP	VP_Title	Effect
1	Howth Summit	M (ns)
2	North Bull Island	M (ns)
3	Greater South Wall, Poolbeg	M-S (ns)
4	Dun Laoghaire, East Pier	M-S (ns)
5	Kiliney Hill, Obelisk	M (ns)
6	Carrickgollogan Hill	M (ns)
7	Bray Promenade	M (ns)
8	Bray Head	S (s)
9	Great Sugar Loaf	S (s)
10	Greystones	VS (s)
11	Kilcoole Beach	VS (s)
12	Six Mile Point	VS (s)
13	Wicklow Town Harbour	S (s)
14	Djouce Mountain	M (ns)
15	Brockagh Mountain	M (ns)
16	Wicklow Lighthouse	SO

VP	VP_Title	Effect
17	Blainroe Golf Club / Beach	SO
18	Brittas Bay	M (ns)
19	Arklow Pier (south side)	M-S (ns)
20	Kilmichael Point	S (ns)
21	Shankill Beach	M (ns)
22	Three Rock Mountain	M (ns)
23	Maheramore Beach	S (s)
24	Kilcoole Rock	VS (s)
25	Greystone Football Club	SO
26	Greystones Beach Bear	VS (s)
27	Greystone The Cove	SO
28	Greystones The Marine Village Park	SO
29	Greystones Redford Cemetery	SO
30	Greystone Golf Course	SO
31	Charlesand	SO

Data sources: CWP; Tailte Éireann – National Mapping Division
Background: © OpenStreetMap contributors.
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Planning Application Boundary (PAB)
SLVIA study area (50 km buffer of the array site / wind farm site)
10 km incremental buffers of array site / wind farm site
Viewpoints selected for the SLVIA
Viewpoints selected but scoped out of the SLVIA based on issues with public access (viewpoint 16/17)
Viewpoints selected but scoped out of the SLVIA on the basis that the views were either not publicly accessible and/or reflected a similar angle of view and visual receptor group to the viewpoints already chosen (Greystones 25, 27-31 omitted.)

Significance of Effect
- Very significant (significant) / VS (s)
- Significant (significant) / S (s)
- Moderate (not significant) / M (ns)
- Moderate-Slight (not significant) / M-S (ns)
- Slight (not significant) / S (ns)
- Scoped out / SO

Blade tip height Zone of Theoretical Visibility (ZTV) (obstructed)
Number of turbines theoretically visible to blade tip height:
- 1 - 15
- 15 - 30
- 30 - 45
- 45 - 60
- No theoretical visibility

codling wind park

Project: Codling Wind Park

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Figure 2d: Summary of residual effects associated with Onshore Viewpoints with Theoretical Obstructed ZTV (Blade Tip for Option B) - South

Page 3 of 3

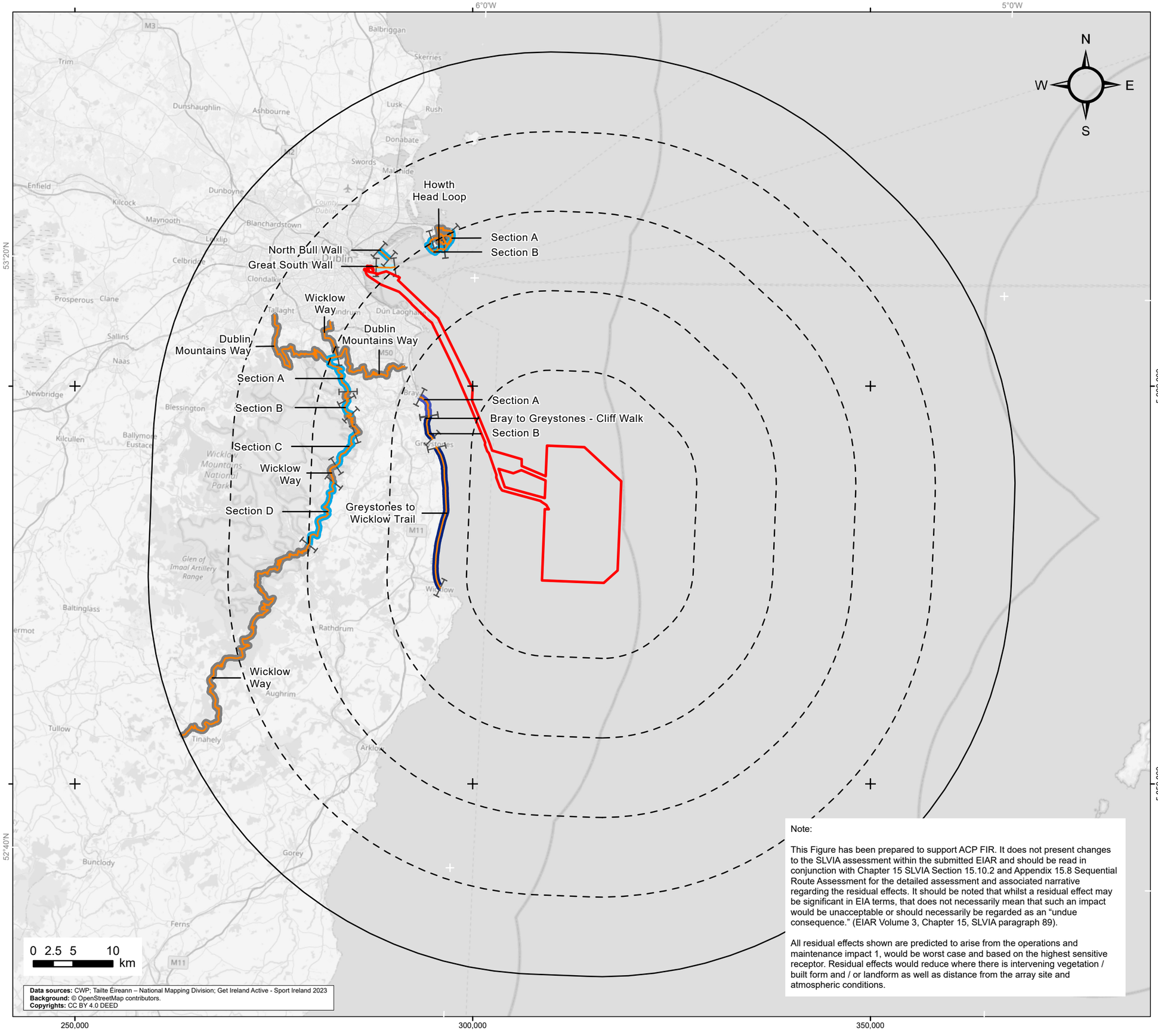
CWP doc. number: CWP-LDA-ENG-08-01-MAP-2022

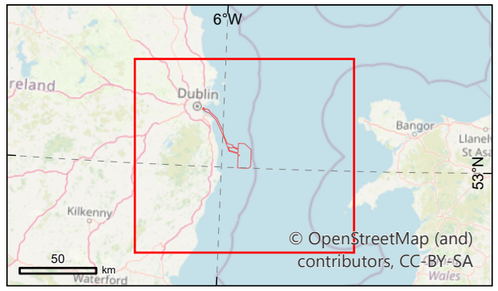
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Scale: 1:150,000

CRS: EPSG 25830

Rev.	Description	Date	By	Chk'd	App'd
A	First issue	2026/01/06	SG	KSo	MBo





- Planning Application Boundary (PAB)
- SLVIA study area (50 km buffer of the array site / wind farm site)
- 10 km incremental buffers of array site / wind farm site
- Key walking routes

Significance of Effect

- Very Significant (significant)
- Significant (significant)
- Moderate (not significant)
- Moderate-Slight (not significant)
- Scoped out
- Section breaks along route

Note:

This Figure has been prepared to support ACP FIR. It does not present changes to the SLVIA assessment within the submitted EIAR and should be read in conjunction with Chapter 15 SLVIA Section 15.10.2 and Appendix 15.8 Sequential Route Assessment for the detailed assessment and associated narrative regarding the residual effects. It should be noted that whilst a residual effect may be significant in EIA terms, that does not necessarily mean that such an impact would be unacceptable or should necessarily be regarded as an "undue consequence." (EIAR Volume 3, Chapter 15, SLVIA paragraph 89).

All residual effects shown are predicted to arise from the operations and maintenance impact 1, would be worst case and based on the highest sensitive receptor. Residual effects would reduce where there is intervening vegetation / built form and / or landform as well as distance from the array site and atmospheric conditions.

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Figure 3: Summary of residual effects associated with Walking Routes

CWP doc. number: CWP-LDA-ENG-08-01-MAP-2023

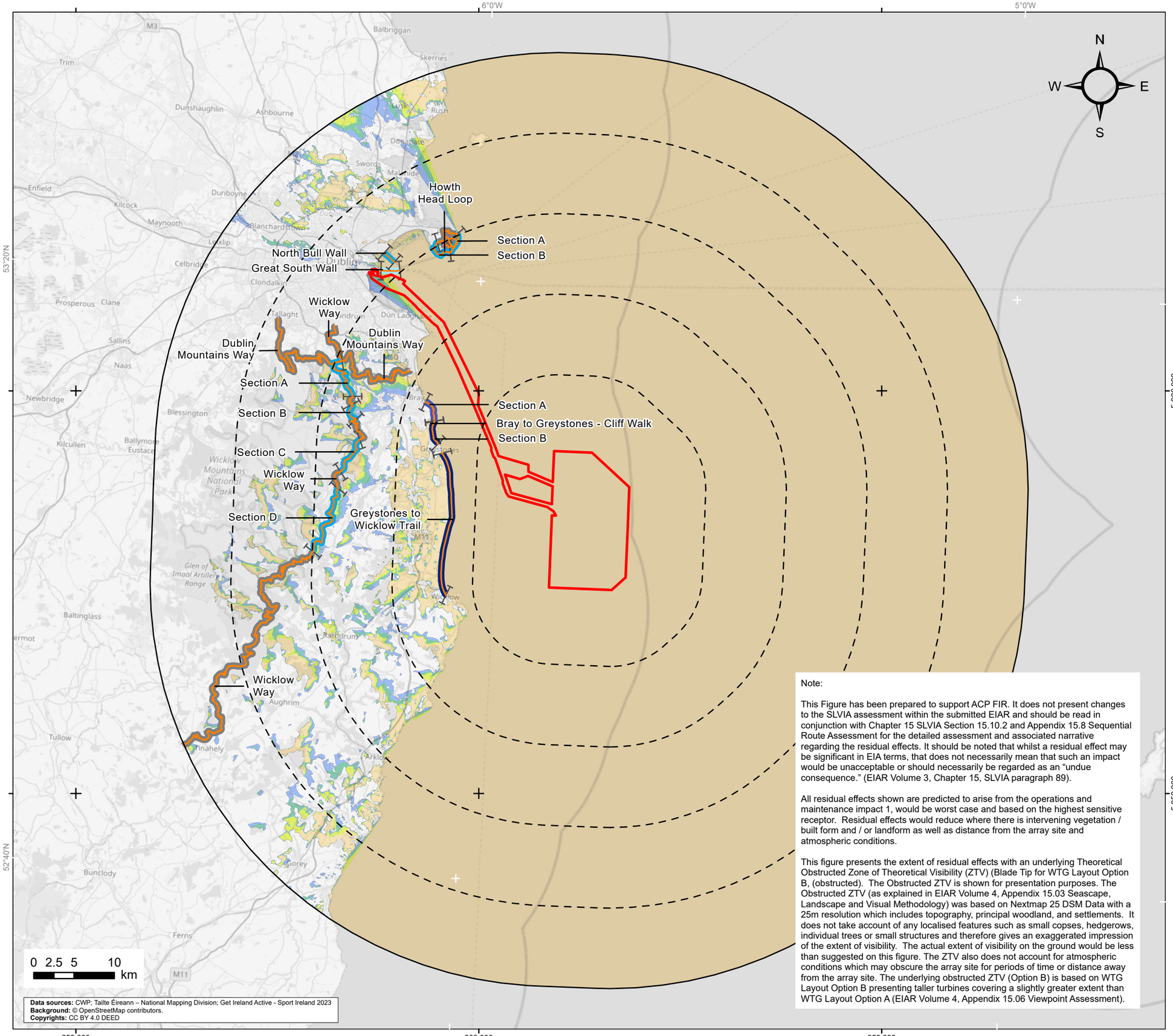
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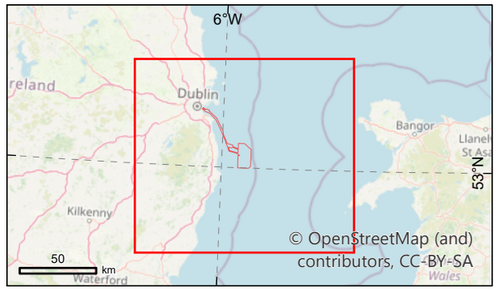
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CRS: EPSG 25830

Rev.	Description	Date	By	Chk'd	App'd
A	First issue	2026/01/06	SG	KSo	MBo





- Planning Application Boundary (PAB)
- SLVIA study area (50 km buffer of the array site / wind farm site)
- 10 km incremental buffers of array site / wind farm site
- Key walking routes

Significance of Effect
- Very Significant (significant)
- Significant (significant)
- Moderate (not significant)
- Moderate-Slight (not significant)
- Scoped out
- Section breaks along route

Blade tip height Zone of Theoretical Visibility (ZTV) (obstructed)

Number of turbines theoretically visible to blade tip height:
- 1 - 15
- 15 - 30
- 30 - 45
- 45 - 60
- No theoretical visibility

Note:

This Figure has been prepared to support ACP FIR. It does not present changes to the SLVIA assessment within the submitted EIAR and should be read in conjunction with Chapter 15 SLVIA Section 15.10.2 and Appendix 15.8 Sequential Route Assessment for the detailed assessment and associated narrative regarding the residual effects. It should be noted that whilst a residual effect may be significant in EIA terms, that does not necessarily mean that such an impact would be unacceptable or should necessarily be regarded as an "undue consequence." (EIAR Volume 3, Chapter 15, SLVIA paragraph 89).

All residual effects shown are predicted to arise from the operations and maintenance impact 1, would be worst case and based on the highest sensitive receptor. Residual effects would reduce where there is intervening vegetation / built form and / or landform as well as distance from the array site and atmospheric conditions.

This figure presents the extent of residual effects with an underlying Theoretical Obstructed Zone of Theoretical Visibility (ZTV) (Blade Tip for WTG Layout Option B, (obstructed). The Obstructed ZTV is shown for presentation purposes. The Obstructed ZTV (as explained in EIAR Volume 4, Appendix 15.03 Seascape, Landscape and Visual Methodology) was based on Nextmap 25 DSM Data with a 25m resolution which includes topography, principal woodland, and settlements. It does not take account of any localised features such as small copses, hedgerows, individual trees or small structures and therefore gives an exaggerated impression of the extent of visibility. The actual extent of visibility on the ground would be less than suggested on this figure. The ZTV also does not account for atmospheric conditions which may obscure the array site for periods of time or distance away from the array site. The underlying obstructed ZTV (Option B) is based on WTG Layout Option B presenting taller turbines covering a slightly greater extent than WTG Layout Option A (EIAR Volume 4, Appendix 15.06 Viewpoint Assessment).

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Figure 3a: Summary of residual effects associated with Walking Routes with Theoretical Obstructed ZTV (Blade Tip for Option B)

CWP doc. number: CWP-LDA-ENG-08-01-MAP-2024

Internal descriptive code:	*Size:*	*CRS:*
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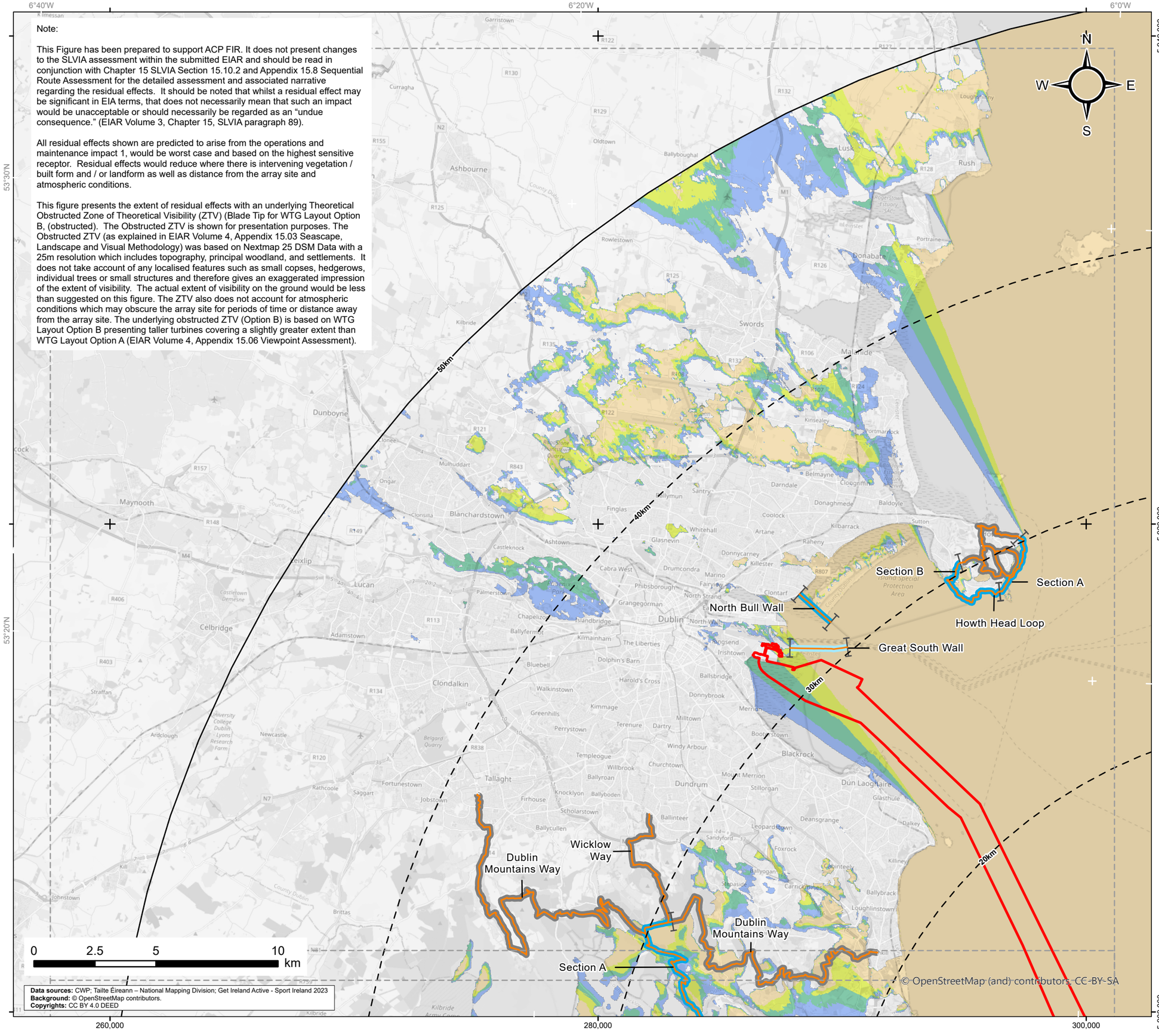
Rev.	Description	Date	By	Chk'd	App'd
A	First issue	2026/01/06	SG	KSo	MBo

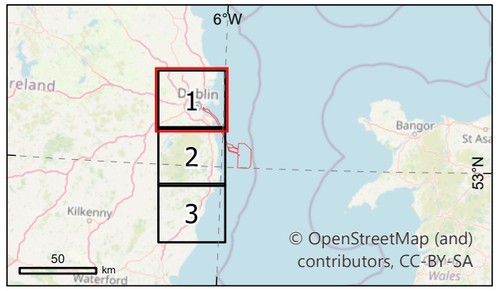
Note:

This Figure has been prepared to support ACP FIR. It does not present changes to the SLVIA assessment within the submitted EIAR and should be read in conjunction with Chapter 15 SLVIA Section 15.10.2 and Appendix 15.8 Sequential Route Assessment for the detailed assessment and associated narrative regarding the residual effects. It should be noted that whilst a residual effect may be significant in EIA terms, that does not necessarily mean that such an impact would be unacceptable or should necessarily be regarded as an "undue consequence." (EIAR Volume 3, Chapter 15, SLVIA paragraph 89).

All residual effects shown are predicted to arise from the operations and maintenance impact 1, would be worst case and based on the highest sensitive receptor. Residual effects would reduce where there is intervening vegetation / built form and / or landform as well as distance from the array site and atmospheric conditions.

This figure presents the extent of residual effects with an underlying Theoretical Obstructed Zone of Theoretical Visibility (ZTV) (Blade Tip for WTG Layout Option B, (obstructed). The Obstructed ZTV is shown for presentation purposes. The Obstructed ZTV (as explained in EIAR Volume 4, Appendix 15.03 Seascape, Landscape and Visual Methodology) was based on Nextmap 25 DSM Data with a 25m resolution which includes topography, principal woodland, and settlements. It does not take account of any localised features such as small copses, hedgerows, individual trees or small structures and therefore gives an exaggerated impression of the extent of visibility. The actual extent of visibility on the ground would be less than suggested on this figure. The ZTV also does not account for atmospheric conditions which may obscure the array site for periods of time or distance away from the array site. The underlying obstructed ZTV (Option B) is based on WTG Layout Option B presenting taller turbines covering a slightly greater extent than WTG Layout Option A (EIAR Volume 4, Appendix 15.06 Viewpoint Assessment).





- Planning Application Boundary (PAB)
- SLVIA study area (50 km buffer of the array site / wind farm site)
- 10 km incremental buffers of array site / wind farm site
- Key walking routes

Significance of Effect
- Very Significant (significant)
- Significant (significant)
- Moderate (not significant)
- Moderate-Slight (not significant)
- Scoped out
- Section breaks along route

Blade tip height Zone of Theoretical Visibility (ZTV) (obstructed)

Number of turbines theoretically visible to blade tip height:
- 1 - 15
- 15 - 30
- 30 - 45
- 45 - 60
- No theoretical visibility

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Figure 3b: Summary of residual effects associated with Walking Routes with Theoretical Obstructed ZTV (Blade Tip for Option B) - North			Page 1 of 3
CWP doc. number:	CWP-LDA-ENG-08-01-MAP-2025		
Internal descriptive code:	Size: A3 Scale: 1:150,000	CRS: EPSG 25830	

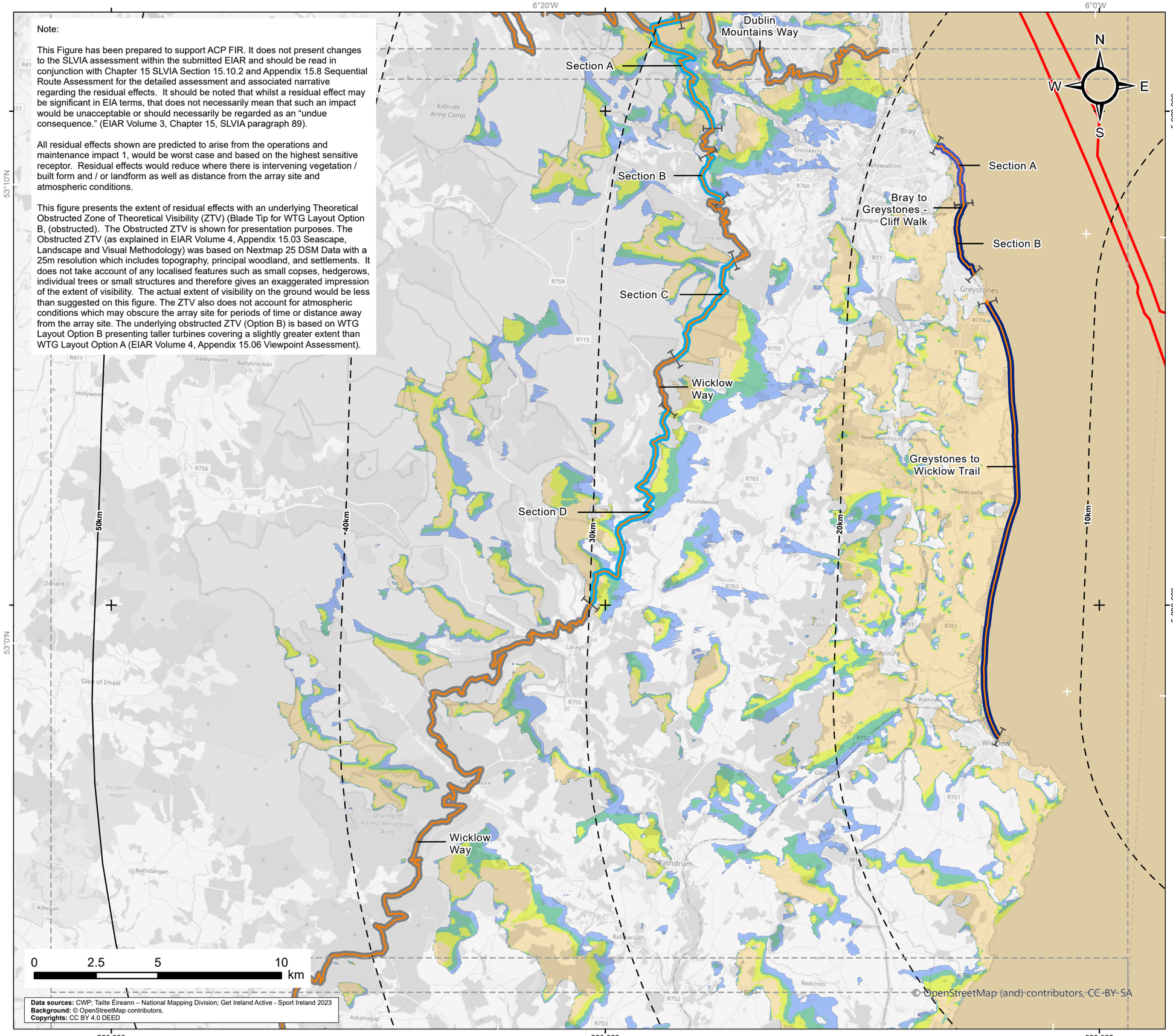
Rev.	Description	Date	By	Chk'd	App'd
A	First issue	2026/01/06	SG	KSo	MBo

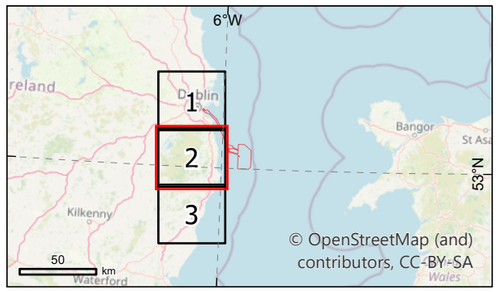
Note:

This Figure has been prepared to support ACP FIR. It does not present changes to the SLVIA assessment within the submitted EIAR and should be read in conjunction with Chapter 15 SLVIA Section 15.10.2 and Appendix 15.8 Sequential Route Assessment for the detailed assessment and associated narrative regarding the residual effects. It should be noted that whilst a residual effect may be significant in EIA terms, that does not necessarily mean that such an impact would be unacceptable or should necessarily be regarded as an "undue consequence." (EIAR Volume 3, Chapter 15, SLVIA paragraph 89).

All residual effects shown are predicted to arise from the operations and maintenance impact 1, would be worst case and based on the highest sensitive receptor. Residual effects would reduce where there is intervening vegetation / built form and / or landform as well as distance from the array site and atmospheric conditions.

This figure presents the extent of residual effects with an underlying Theoretical Obstructed Zone of Theoretical Visibility (ZTV) (Blade Tip for WTG Layout Option B, (obstructed). The Obstructed ZTV is shown for presentation purposes. The Obstructed ZTV (as explained in EIAR Volume 4, Appendix 15.03 Seascape, Landscape and Visual Methodology) was based on Nextmap 25 DSM Data with a 25m resolution which includes topography, principal woodland, and settlements. It does not take account of any localised features such as small copses, hedgerows, individual trees or small structures and therefore gives an exaggerated impression of the extent of visibility. The actual extent of visibility on the ground would be less than suggested on this figure. The ZTV also does not account for atmospheric conditions which may obscure the array site for periods of time or distance away from the array site. The underlying obstructed ZTV (Option B) is based on WTG Layout Option B presenting taller turbines covering a slightly greater extent than WTG Layout Option A (EIAR Volume 4, Appendix 15.06 Viewpoint Assessment).





- Planning Application Boundary (PAB)
- SLVIA study area (50 km buffer of the array site / wind farm site)
- 10 km incremental buffers of array site / wind farm site
- Key walking routes

Significance of Effect
- Very Significant (significant)
- Significant (significant)
- Moderate (not significant)
- Moderate-Slight (not significant)
- Scoped out
- Section breaks along route

Blade tip height Zone of Theoretical Visibility (ZTV) (obstructed)

Number of turbines theoretically visible to blade tip height:
- 1 - 15
- 15 - 30
- 30 - 45
- 45 - 60
- No theoretical visibility

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Figure 3c: Summary of residual effects associated with Walking Routes with Theoretical Obstructed ZTV (Blade Tip for Option B) - Central

Page 2 of 3

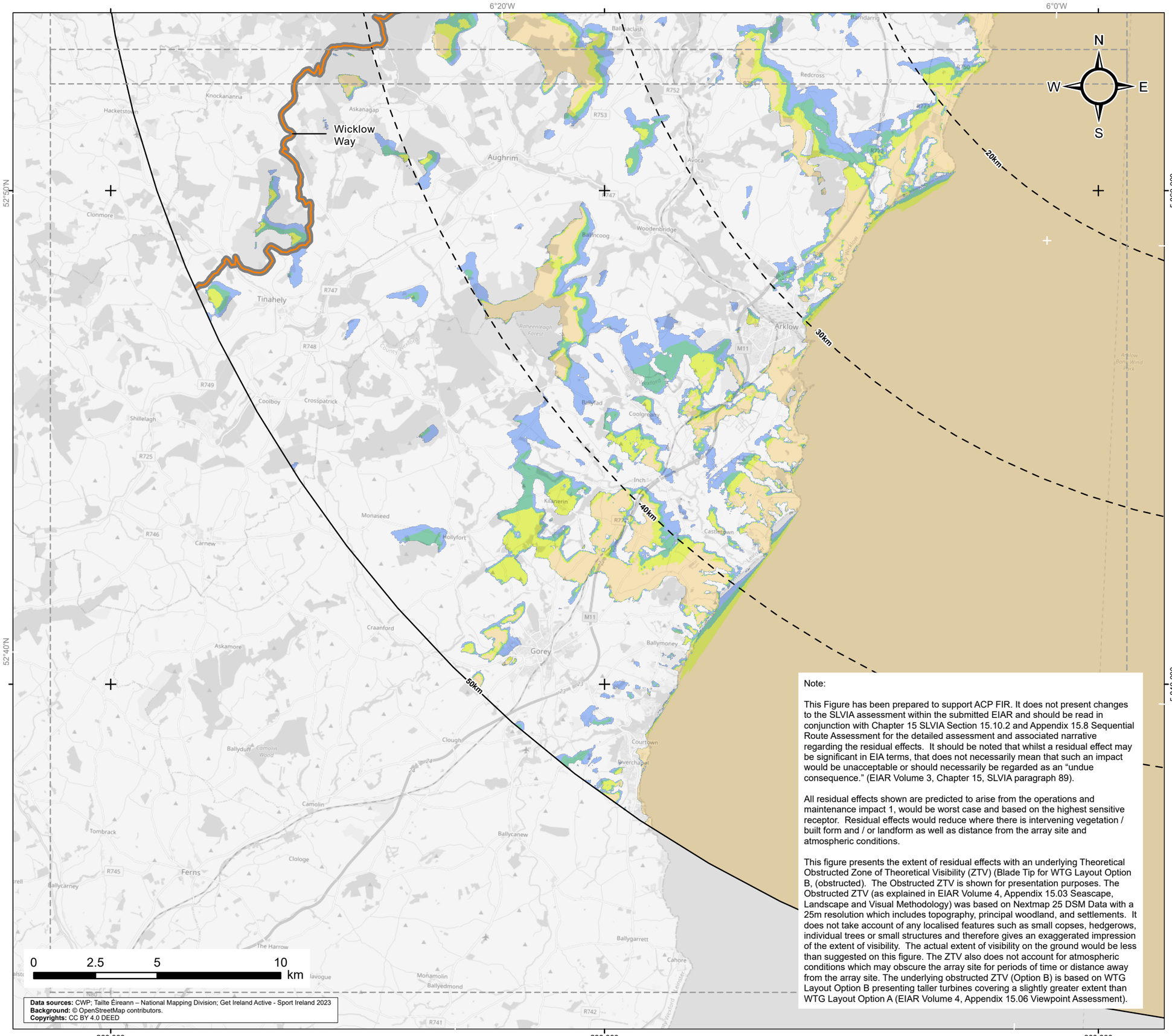
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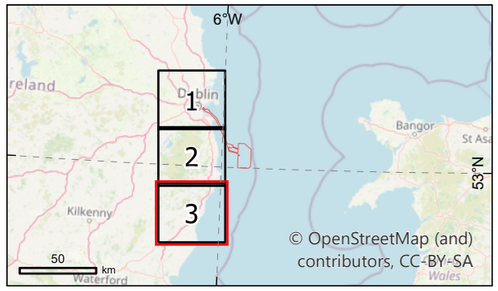
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CRS: EPSG 25830

Rev.	Description	Date	By	Chk'd	App'd
A	First issue	2026/01/06	SG	KSo	MBo





- Planning Application Boundary (PAB)
- SLVIA study area (50 km buffer of the array site / wind farm site)
- 10 km incremental buffers of array site / wind farm site
- Key walking routes

Significance of Effect
- Very Significant (significant)
- Significant (significant)
- Moderate (not significant)
- Moderate-Slight (not significant)
- Scoped out
- Section breaks along route

Blade tip height Zone of Theoretical Visibility (ZTV) (obstructed)

Number of turbines theoretically visible to blade tip height:
- 1 - 15
- 15 - 30
- 30 - 45
- 45 - 60
- No theoretical visibility

Note:

This Figure has been prepared to support ACP FIR. It does not present changes to the SLVIA assessment within the submitted EIAR and should be read in conjunction with Chapter 15 SLVIA Section 15.10.2 and Appendix 15.8 Sequential Route Assessment for the detailed assessment and associated narrative regarding the residual effects. It should be noted that whilst a residual effect may be significant in EIA terms, that does not necessarily mean that such an impact would be unacceptable or should necessarily be regarded as an "undue consequence." (EIAR Volume 3, Chapter 15, SLVIA paragraph 89).

All residual effects shown are predicted to arise from the operations and maintenance impact 1, would be worst case and based on the highest sensitive receptor. Residual effects would reduce where there is intervening vegetation / built form and / or landform as well as distance from the array site and atmospheric conditions.

This figure presents the extent of residual effects with an underlying Theoretical Obstructed Zone of Theoretical Visibility (ZTV) (Blade Tip for WTG Layout Option B, (obstructed). The Obstructed ZTV is shown for presentation purposes. The Obstructed ZTV (as explained in EIAR Volume 4, Appendix 15.03 Seascape, Landscape and Visual Methodology) was based on Nextmap 25 DSM Data with a 25m resolution which includes topography, principal woodland, and settlements. It does not take account of any localised features such as small copses, hedgerows, individual trees or small structures and therefore gives an exaggerated impression of the extent of visibility. The actual extent of visibility on the ground would be less than suggested on this figure. The ZTV also does not account for atmospheric conditions which may obscure the array site for periods of time or distance away from the array site. The underlying obstructed ZTV (Option B) is based on WTG Layout Option B presenting taller turbines covering a slightly greater extent than WTG Layout Option A (EIAR Volume 4, Appendix 15.06 Viewpoint Assessment).

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Figure 3d: Summary of residual effects associated with Walking Routes with Theoretical Obstructed ZTV (Blade Tip for Option B) - South

CWP doc. number: CWP-LDA-ENG-08-01-MAP-2027

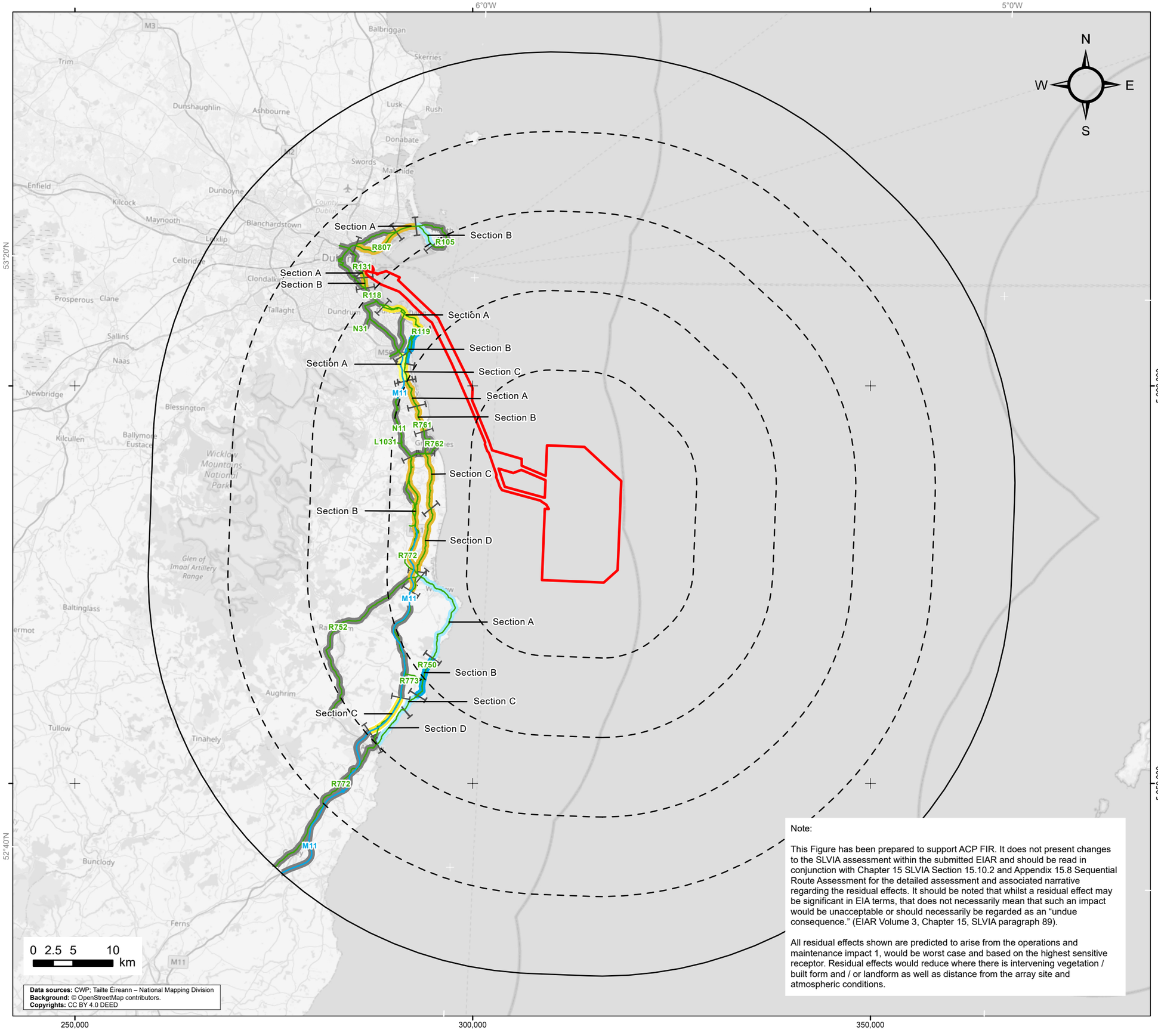
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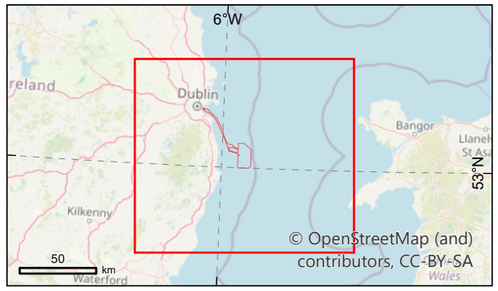
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CRS: EPSG 25830

Rev.	Description	Date	By	Chk'd	App'd
A	First issue	2026/01/06	SG	KSo	MBo





- Planning Application Boundary (PAB)
- SLVIA study area (50 km buffer of the array site / wind farm site)
- 10 km incremental buffers of array site / wind farm site

Selected visual receptors (named on map)

- Motorway
- Roads - Other

Significance of Effect

- Moderate (not significant)
- Moderate-Slight (not significant)
- Slight (not significant)
- Not Significant (not significant)
- Not Significant-Imperceptible (not significant)
- Scoped out
- Section breaks along route

Note:

This Figure has been prepared to support ACP FIR. It does not present changes to the SLVIA assessment within the submitted EIAR and should be read in conjunction with Chapter 15 SLVIA Section 15.10.2 and Appendix 15.8 Sequential Route Assessment for the detailed assessment and associated narrative regarding the residual effects. It should be noted that whilst a residual effect may be significant in EIA terms, that does not necessarily mean that such an impact would be unacceptable or should necessarily be regarded as an "undue consequence." (EIAR Volume 3, Chapter 15, SLVIA paragraph 89).

All residual effects shown are predicted to arise from the operations and maintenance impact 1, would be worst case and based on the highest sensitive receptor. Residual effects would reduce where there is intervening vegetation / built form and / or landform as well as distance from the array site and atmospheric conditions.

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Figure 4: Summary of residual effects associated with Roads

CWP doc. number: CWP-LDA-ENG-08-01-MAP-2028

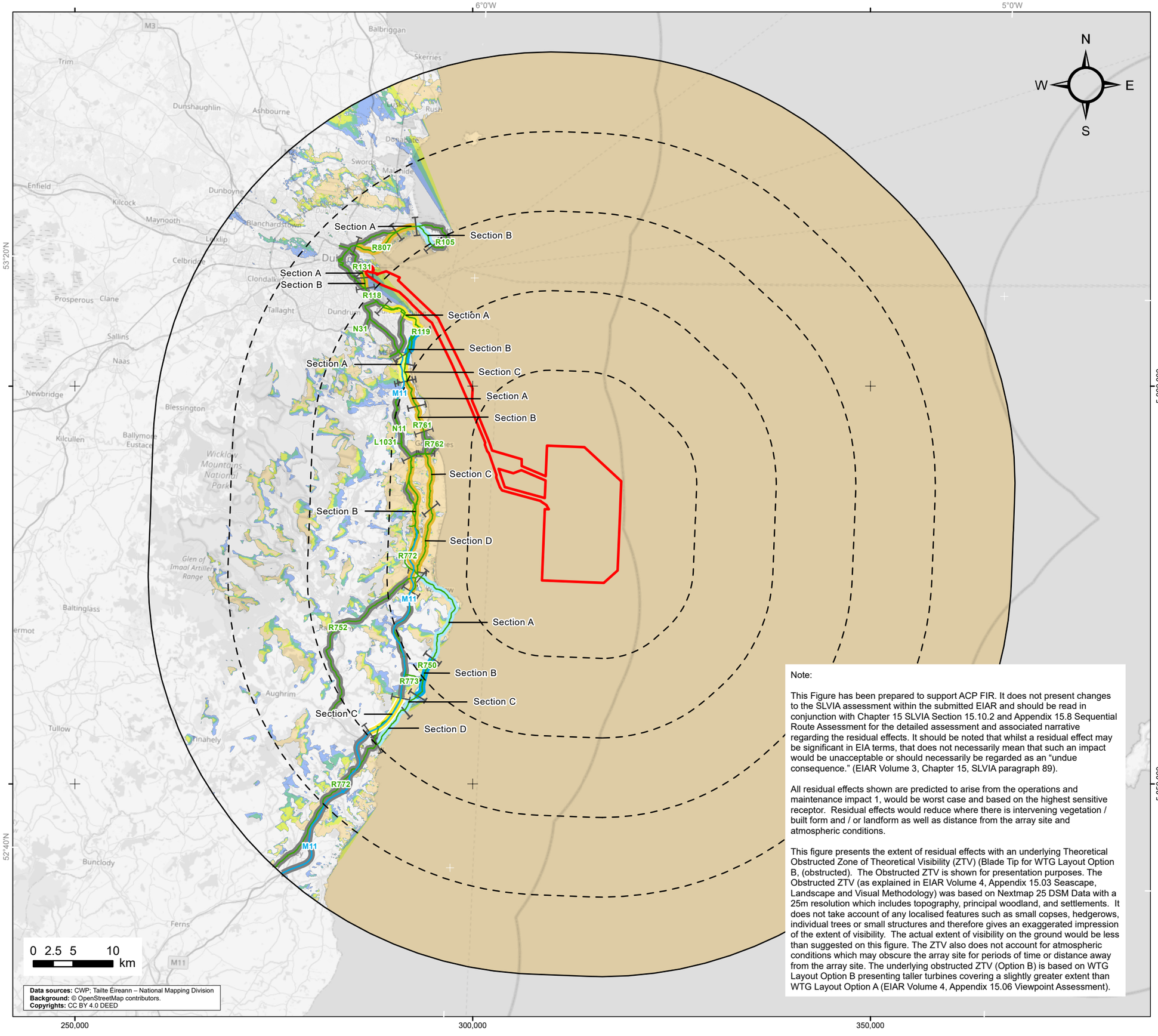
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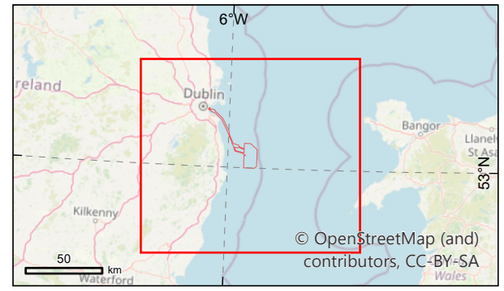
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Rev.	Description	Date	By	Chk'd	App'd
A	First issue	2026/01/06	SMc	KSo	MBo





Planning Application Boundary (PAB)

SLVIA study area (50 km buffer of the array site / wind farm site)

10 km incremental buffers of array site / wind farm site

Selected visual receptors (named on map)

- Motorway
- Roads - Other

Significance of Effect

- Moderate (not significant)
- Moderate-Slight (not significant)
- Slight (not significant)
- Not Significant (not significant)
- Not Significant-Imperceptible (not significant)
- Scoped out
- Section breaks along route

Blade tip height Zone of Theoretical Visibility (ZTV) (obstructed)

Number of turbines theoretically visible to blade tip height:

- 1 - 15
- 15 - 30
- 30 - 45
- 45 - 60
- No theoretical visibility

Note:

This Figure has been prepared to support ACP FIR. It does not present changes to the SLVIA assessment within the submitted EIAR and should be read in conjunction with Chapter 15 SLVIA Section 15.10.2 and Appendix 15.8 Sequential Route Assessment for the detailed assessment and associated narrative regarding the residual effects. It should be noted that whilst a residual effect may be significant in EIA terms, that does not necessarily mean that such an impact would be unacceptable or should necessarily be regarded as an "undue consequence." (EIAR Volume 3, Chapter 15, SLVIA paragraph 89).

All residual effects shown are predicted to arise from the operations and maintenance impact 1, would be worst case and based on the highest sensitive receptor. Residual effects would reduce where there is intervening vegetation / built form and / or landform as well as distance from the array site and atmospheric conditions.

This figure presents the extent of residual effects with an underlying Theoretical Obstructed Zone of Theoretical Visibility (ZTV) (Blade Tip for WTG Layout Option B, (obstructed). The Obstructed ZTV is shown for presentation purposes. The Obstructed ZTV (as explained in EIAR Volume 4, Appendix 15.03 Seascape, Landscape and Visual Methodology) was based on Nextmap 25 DSM Data with a 25m resolution which includes topography, principal woodland, and settlements. It does not take account of any localised features such as small copses, hedgerows, individual trees or small structures and therefore gives an exaggerated impression of the extent of visibility. The actual extent of visibility on the ground would be less than suggested on this figure. The ZTV also does not account for atmospheric conditions which may obscure the array site for periods of time or distance away from the array site. The underlying obstructed ZTV (Option B) is based on WTG Layout Option B presenting taller turbines covering a slightly greater extent than WTG Layout Option A (EIAR Volume 4, Appendix 15.06 Viewpoint Assessment).

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Contractor: LDĀDESIGN www.lda-design.co.uk

Figure 4a: Summary of residual effects associated with Roads with Theoretical Obstructed ZTV (Blade Tip for Option B)

CWP doc. number: CWP-LDA-ENG-08-01-MAP-2029

Internal descriptive code: ALL - PAB_WF.RLB.BUFF.50km - VISUAL.RECEPTORS.460K - EIAR.FIG.15.09

Size: A3

Scale: 1:460,000

CRS: EPSG 25830

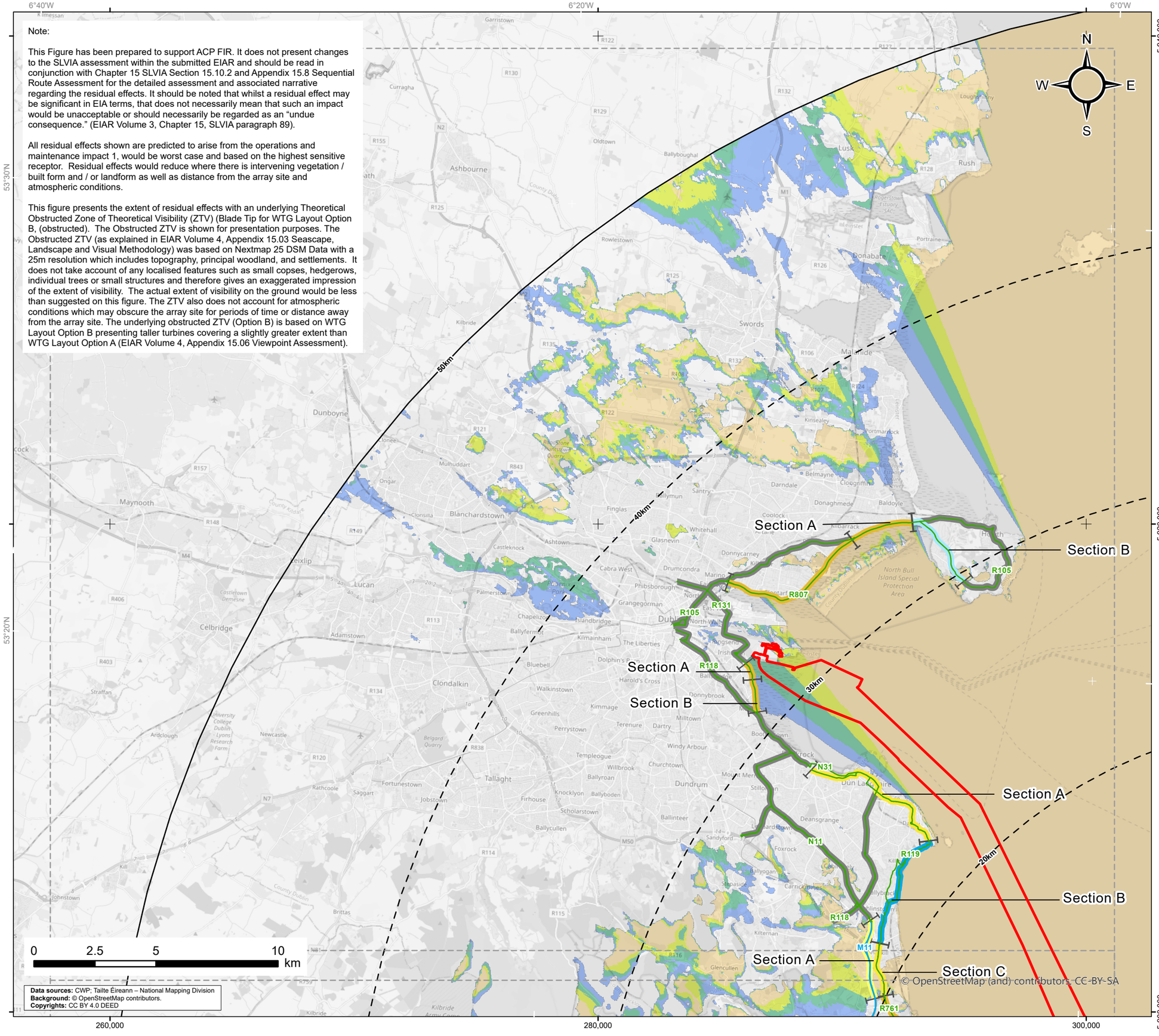
Rev.	Description	Date	By	Chk'd	App'd
A	First issue	2026/01/06	SMc	KSo	MBo

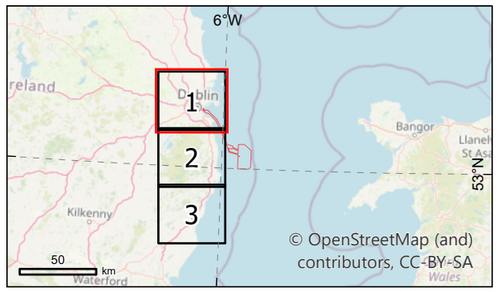
Note:

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All residual effects shown are predicted to arise from the operations and maintenance impact 1, would be worst case and based on the highest sensitive receptor. Residual effects would reduce where there is intervening vegetation / built form and / or landform as well as distance from the array site and atmospheric conditions.

This figure presents the extent of residual effects with an underlying Theoretical Obstructed Zone of Theoretical Visibility (ZTV) (Blade Tip for WTG Layout Option B, (obstructed). The Obstructed ZTV is shown for presentation purposes. The Obstructed ZTV (as explained in EIAR Volume 4, Appendix 15.03 Seascape, Landscape and Visual Methodology) was based on Nextmap 25 DSM Data with a 25m resolution which includes topography, principal woodland, and settlements. It does not take account of any localised features such as small copses, hedgerows, individual trees or small structures and therefore gives an exaggerated impression of the extent of visibility. The actual extent of visibility on the ground would be less than suggested on this figure. The ZTV also does not account for atmospheric conditions which may obscure the array site for periods of time or distance away from the array site. The underlying obstructed ZTV (Option B) is based on WTG Layout Option B presenting taller turbines covering a slightly greater extent than WTG Layout Option A (EIAR Volume 4, Appendix 15.06 Viewpoint Assessment).





- Planning Application Boundary (PAB)
- SLVIA study area (50 km buffer of the array site / wind farm site)
- 10 km incremental buffers of array site / wind farm site

Selected visual receptors (named on map)

- Motorway
- Roads - Other

Significance of Effect

- Moderate (not significant)
- Moderate-Slight (not significant)
- Slight (not significant)
- Not Significant (not significant)
- Not Significant-Imperceptible (not significant)
- Scoped out
- Section breaks along route

Blade tip height Zone of Theoretical Visibility (ZTV) (obstructed)

Number of turbines theoretically visible to blade tip height:

- 1 - 15
- 15 - 30
- 30 - 45
- 45 - 60
- No theoretical visibility

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Project: Codling Wind Park

Contractor: LDĀDESIGN www.lda-design.co.uk

Figure 4b: Summary of residual effects associated with Roads with Theoretical Obstructed ZTV (Blade Tip for Option B) - North

CWP doc. number: CWP-LDA-ENG-08-01-MAP-2030

Internal descriptive code:

Size: A3

Scale: 1:150,000

CRS: EPSG 25830

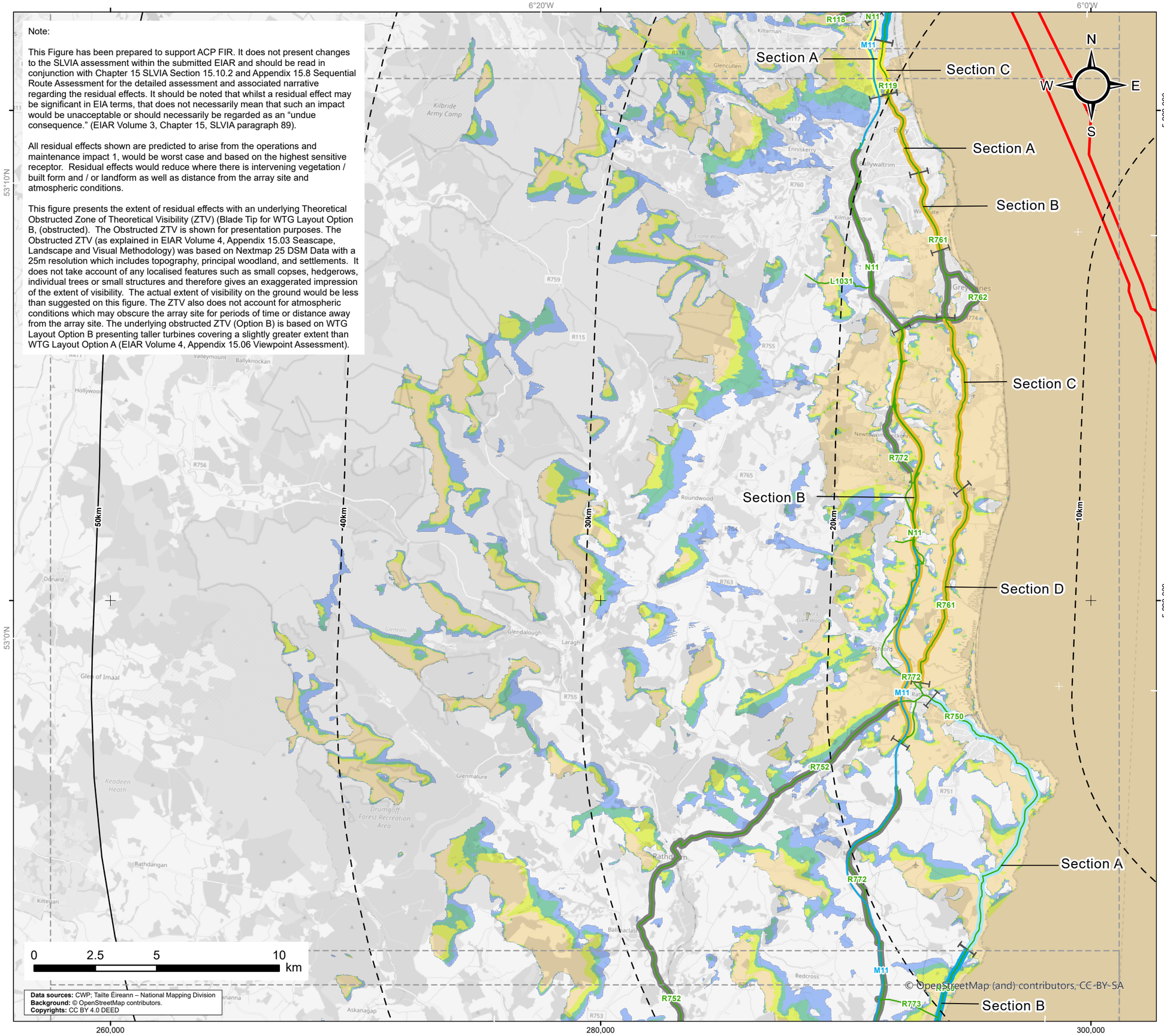
Rev.	Description	Date	By	Chk'd	App'd
A	First issue	2026/01/06	SG	KSo	MBo

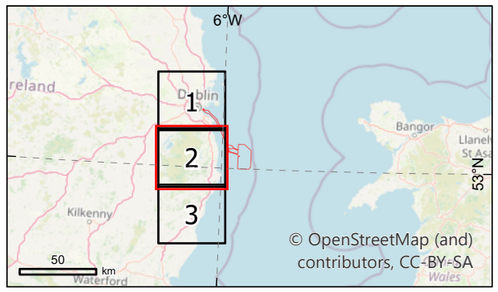
Note:

This Figure has been prepared to support ACP FIR. It does not present changes to the SLVIA assessment within the submitted EIAR and should be read in conjunction with Chapter 15 SLVIA Section 15.10.2 and Appendix 15.8 Sequential Route Assessment for the detailed assessment and associated narrative regarding the residual effects. It should be noted that whilst a residual effect may be significant in EIA terms, that does not necessarily mean that such an impact would be unacceptable or should necessarily be regarded as an "undue consequence." (EIAR Volume 3, Chapter 15, SLVIA paragraph 89).

All residual effects shown are predicted to arise from the operations and maintenance impact 1, would be worst case and based on the highest sensitive receptor. Residual effects would reduce where there is intervening vegetation / built form and / or landform as well as distance from the array site and atmospheric conditions.

This figure presents the extent of residual effects with an underlying Theoretical Obstructed Zone of Theoretical Visibility (ZTV) (Blade Tip for WTG Layout Option B, (obstructed). The Obstructed ZTV is shown for presentation purposes. The Obstructed ZTV (as explained in EIAR Volume 4, Appendix 15.03 Seascape, Landscape and Visual Methodology) was based on Nextmap 25 DSM Data with a 25m resolution which includes topography, principal woodland, and settlements. It does not take account of any localised features such as small copses, hedgerows, individual trees or small structures and therefore gives an exaggerated impression of the extent of visibility. The actual extent of visibility on the ground would be less than suggested on this figure. The ZTV also does not account for atmospheric conditions which may obscure the array site for periods of time or distance away from the array site. The underlying obstructed ZTV (Option B) is based on WTG Layout Option B presenting taller turbines covering a slightly greater extent than WTG Layout Option A (EIAR Volume 4, Appendix 15.06 Viewpoint Assessment).





- Planning Application Boundary (PAB)
- SLVIA study area (50 km buffer of the array site / wind farm site)
- 10 km incremental buffers of array site / wind farm site

Selected visual receptors (named on map)

- Motorway
- Roads - Other

Significance of Effect

- Moderate (not significant)
- Moderate-Slight (not significant)
- Slight (not significant)
- Not Significant (not significant)
- Not Significant-Imperceptible (not significant)
- Scoped out
- Section breaks along route

Blade tip height Zone of Theoretical Visibility (ZTV) (obstructed)

Number of turbines theoretically visible to blade tip height:

- 1 - 15
- 15 - 30
- 30 - 45
- 45 - 60
- No theoretical visibility

codling wind park

Project: Codling Wind Park

Contractor: LDĀDESIGN www.lda-design.co.uk

Figure 4c: Summary of residual effects associated with Roads with Theoretical Obstructed ZTV (Blade Tip for Option B) - Central

CWP doc. number: CWP-LDA-ENG-08-01-MAP-2031

Internal descriptive code:

Size: A3

Scale: 1:150,000

CRS: EPSG 25830

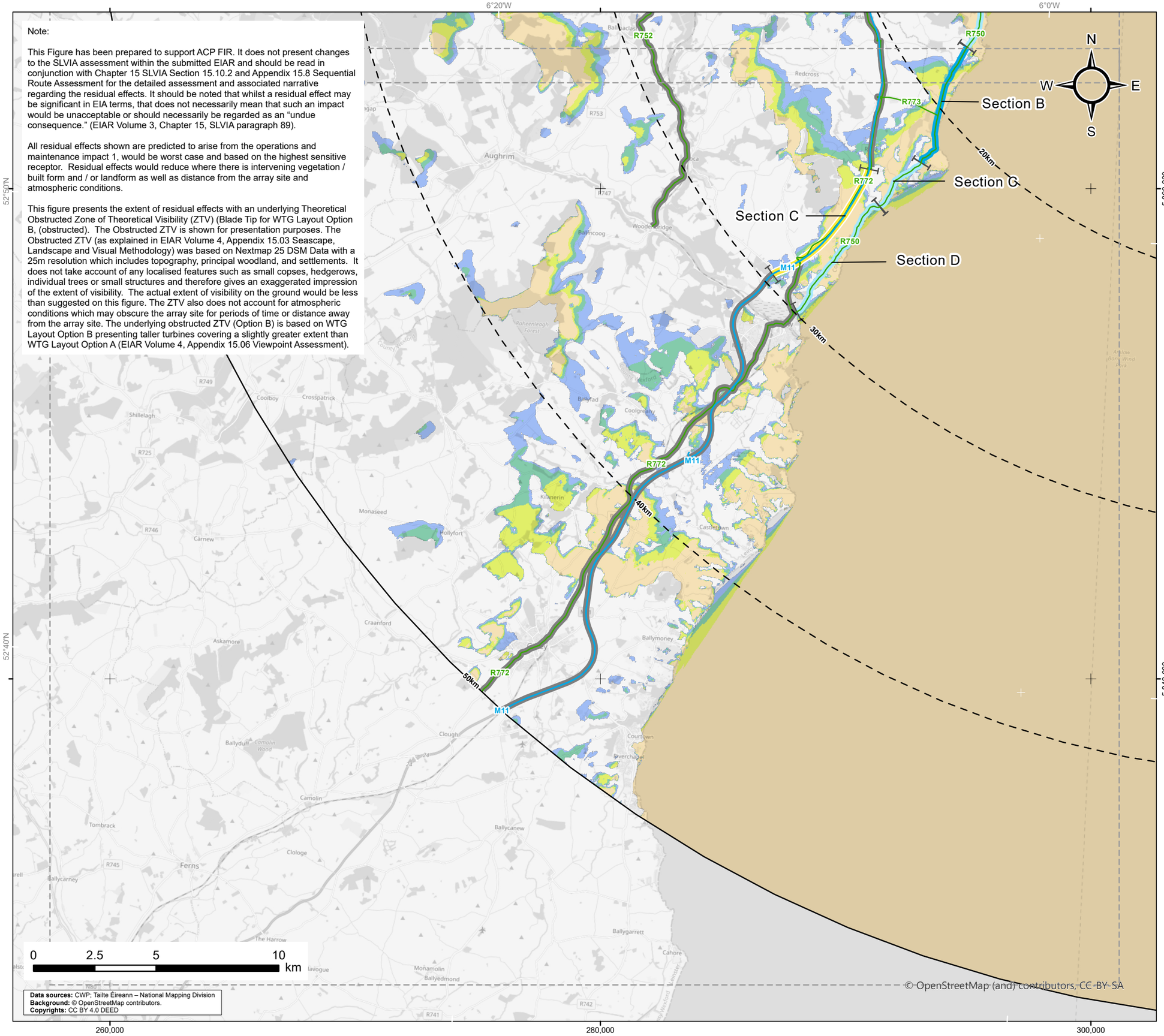
Rev.	Description	Date	By	Chk'd	App'd
A	First issue	2026/01/06	SG	KSo	MBo

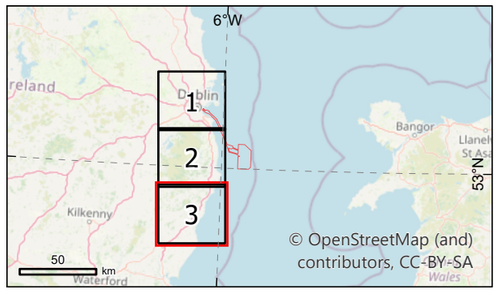
Note:

This Figure has been prepared to support ACP FIR. It does not present changes to the SLVIA assessment within the submitted EIAR and should be read in conjunction with Chapter 15 SLVIA Section 15.10.2 and Appendix 15.8 Sequential Route Assessment for the detailed assessment and associated narrative regarding the residual effects. It should be noted that whilst a residual effect may be significant in EIA terms, that does not necessarily mean that such an impact would be unacceptable or should necessarily be regarded as an "undue consequence." (EIAR Volume 3, Chapter 15, SLVIA paragraph 89).

All residual effects shown are predicted to arise from the operations and maintenance impact 1, would be worst case and based on the highest sensitive receptor. Residual effects would reduce where there is intervening vegetation / built form and / or landform as well as distance from the array site and atmospheric conditions.

This figure presents the extent of residual effects with an underlying Theoretical Obstructed Zone of Theoretical Visibility (ZTV) (Blade Tip for WTG Layout Option B, (obstructed). The Obstructed ZTV is shown for presentation purposes. The Obstructed ZTV (as explained in EIAR Volume 4, Appendix 15.03 Seascape, Landscape and Visual Methodology) was based on Nextmap 25 DSM Data with a 25m resolution which includes topography, principal woodland, and settlements. It does not take account of any localised features such as small copses, hedgerows, individual trees or small structures and therefore gives an exaggerated impression of the extent of visibility. The actual extent of visibility on the ground would be less than suggested on this figure. The ZTV also does not account for atmospheric conditions which may obscure the array site for periods of time or distance away from the array site. The underlying obstructed ZTV (Option B) is based on WTG Layout Option B presenting taller turbines covering a slightly greater extent than WTG Layout Option A (EIAR Volume 4, Appendix 15.06 Viewpoint Assessment).





Planning Application Boundary (PAB)

SLVIA study area (50 km buffer of the array site / wind farm site)

10 km incremental buffers of array site / wind farm site

Selected visual receptors (named on map)

- Motorway
- Roads - Other

Significance of Effect

- Moderate (not significant)
- Moderate-Slight (not significant)
- Slight (not significant)
- Not Significant (not significant)
- Not Significant-Imperceptible (not significant)
- Scoped out
- Section breaks along route

Blade tip height Zone of Theoretical Visibility (ZTV) (obstructed)

Number of turbines theoretically visible to blade tip height:

- 1 - 15
- 15 - 30
- 30 - 45
- 45 - 60
- No theoretical visibility

codling wind park

Project: Codling Wind Park

Contractor: LDĀDESIGN www.lda-design.co.uk

Figure 4d: Summary of residual effects associated with Roads with Theoretical Obstructed ZTV (Blade Tip for Option B) - South

CWP doc. number: CWP-LDA-ENG-08-01-MAP-2032

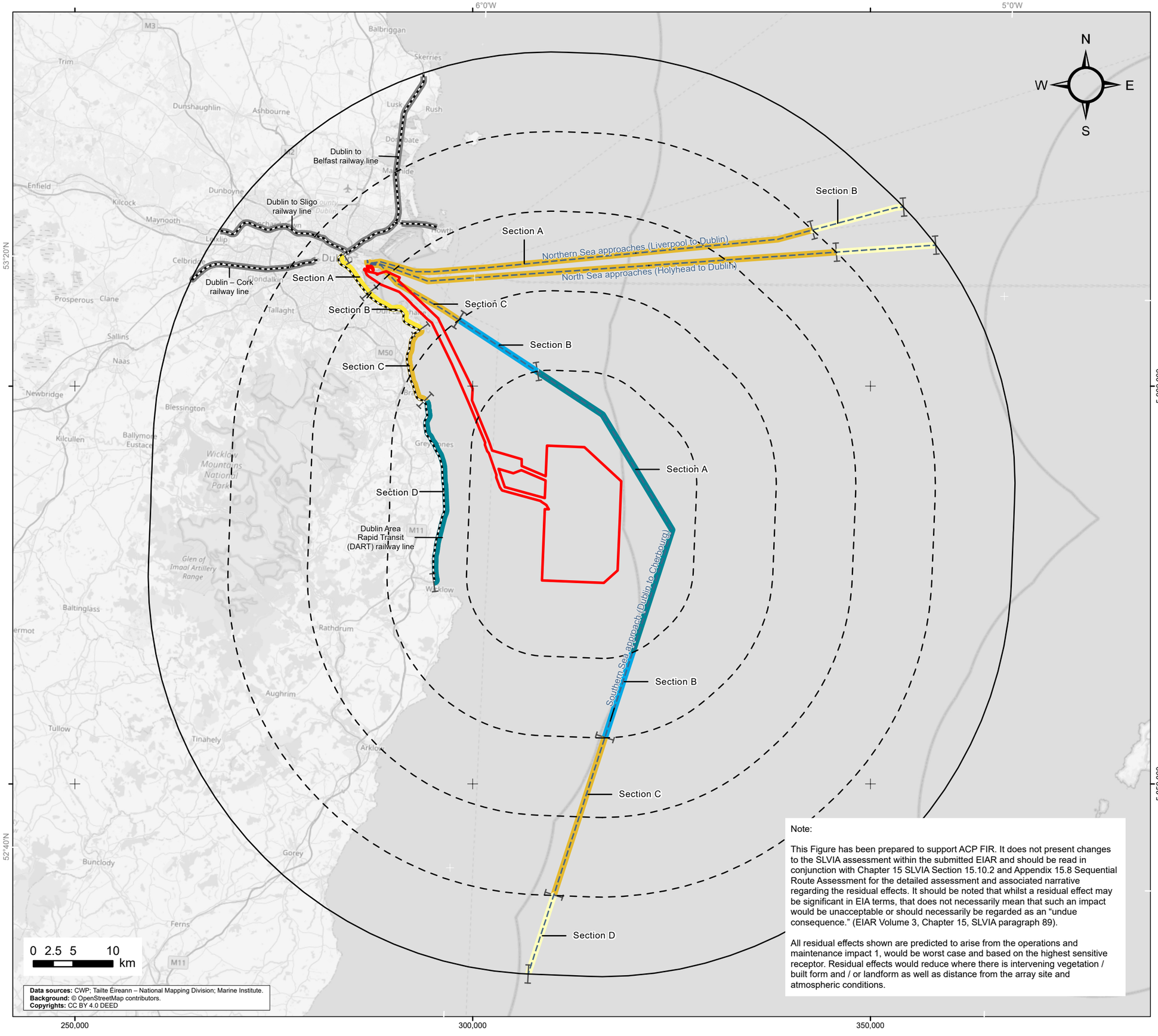
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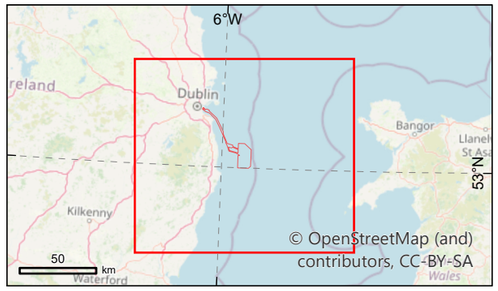
Size: A3

Scale: 1:150,000

CRS: EPSG 25830

Rev.	Description	Date	By	Chk'd	App'd
A	First issue	2026/01/06	SG	KSo	MBo





- Planning Application Boundary (PAB)
- SLVIA study area (50 km buffer of the array site / wind farm site)
- 10 km incremental buffers of array site / wind farm site
- National ferry routes
- Rail routes

Significance of Effect

- Significant-Moderate (significant)
- Moderate (not significant)
- Slight (not significant)
- Not Significant (not significant)
- Not Significant-Imperceptible (not significant)
- Scoped out
- Section breaks along route

Note:

This Figure has been prepared to support ACP FIR. It does not present changes to the SLVIA assessment within the submitted EIAR and should be read in conjunction with Chapter 15 SLVIA Section 15.10.2 and Appendix 15.8 Sequential Route Assessment for the detailed assessment and associated narrative regarding the residual effects. It should be noted that whilst a residual effect may be significant in EIA terms, that does not necessarily mean that such an impact would be unacceptable or should necessarily be regarded as an "undue consequence." (EIAR Volume 3, Chapter 15, SLVIA paragraph 89).

All residual effects shown are predicted to arise from the operations and maintenance impact 1, would be worst case and based on the highest sensitive receptor. Residual effects would reduce where there is intervening vegetation / built form and / or landform as well as distance from the array site and atmospheric conditions.

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Project: Codling Wind Park

Contractor: LDĀDESIGN www.lda-design.co.uk

Figure 5: Summary of residual effects associated with Rail / Ferry routes

CWP doc. number: CWP-LDA-ENG-08-01-MAP-2033

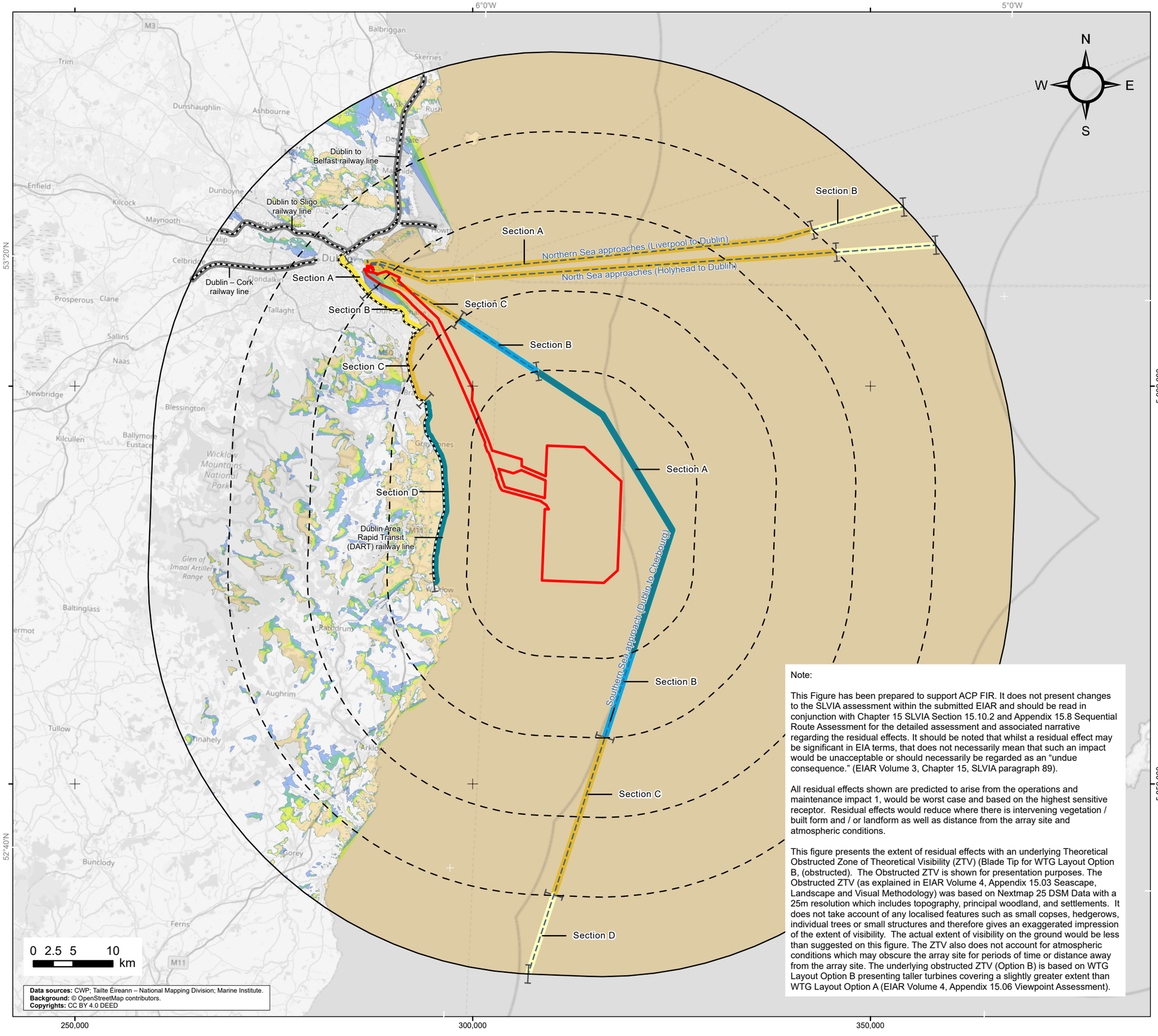
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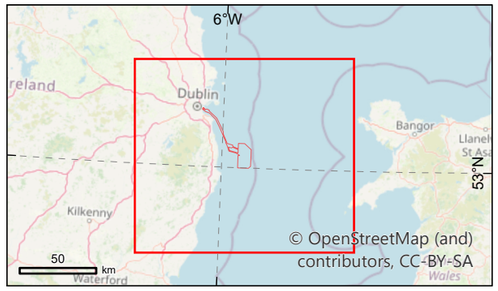
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CRS: EPSG 25830

Rev.	Description	Date	By	Chk'd	App'd
A	First issue	2026/01/06	SMc	KSo	MBo





- Planning Application Boundary (PAB)
- SLVIA study area (50 km buffer of the array site / wind farm site)
- 10 km incremental buffers of array site / wind farm site
- National ferry routes
- Rail routes

Significance of Effect

- Significant-Moderate (significant)
- Moderate (not significant)
- Slight (not significant)
- Not Significant (not significant)
- Not Significant-Imperceptible (not significant)
- Scoped out
- Section breaks along route

Blade tip height Zone of Theoretical Visibility (ZTV) (obstructed)

Number of turbines theoretically visible to blade tip height:

- 1 - 15
- 15 - 30
- 30 - 45
- 45 - 60
- No theoretical visibility

Note:

This Figure has been prepared to support ACP FIR. It does not present changes to the SLVIA assessment within the submitted EIAR and should be read in conjunction with Chapter 15 SLVIA Section 15.10.2 and Appendix 15.8 Sequential Route Assessment for the detailed assessment and associated narrative regarding the residual effects. It should be noted that whilst a residual effect may be significant in EIA terms, that does not necessarily mean that such an impact would be unacceptable or should necessarily be regarded as an "undue consequence." (EIAR Volume 3, Chapter 15, SLVIA paragraph 89).

All residual effects shown are predicted to arise from the operations and maintenance impact 1, would be worst case and based on the highest sensitive receptor. Residual effects would reduce where there is intervening vegetation / built form and / or landform as well as distance from the array site and atmospheric conditions.

This figure presents the extent of residual effects with an underlying Theoretical Obstructed Zone of Theoretical Visibility (ZTV) (Blade Tip for WTG Layout Option B, (obstructed). The Obstructed ZTV is shown for presentation purposes. The Obstructed ZTV (as explained in EIAR Volume 4, Appendix 15.03 Seascape, Landscape and Visual Methodology) was based on Nextmap 25 DSM Data with a 25m resolution which includes topography, principal woodland, and settlements. It does not take account of any localised features such as small copses, hedgerows, individual trees or small structures and therefore gives an exaggerated impression of the extent of visibility. The actual extent of visibility on the ground would be less than suggested on this figure. The ZTV also does not account for atmospheric conditions which may obscure the array site for periods of time or distance away from the array site. The underlying obstructed ZTV (Option B) is based on WTG Layout Option B presenting taller turbines covering a slightly greater extent than WTG Layout Option A (EIAR Volume 4, Appendix 15.06 Viewpoint Assessment).

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Project: Codling Wind Park

Contractor: LDĀDESIGN www.lda-design.co.uk

Figure 5a: Summary of residual effects associated with Rail / Ferry routes with Theoretical Obstructed ZTV (Blade Tip for Option B)

CWP doc. number: CWP-LDA-ENG-08-01-MAP-2034

Internal descriptive code: ALL - PAB..WF.RLB.BUFF.50km - VISUAL.RECEPTORS.460K - EIAR.FIG.15.09

Size: A3

Scale: 1:460,000

CRS: EPSG 25830

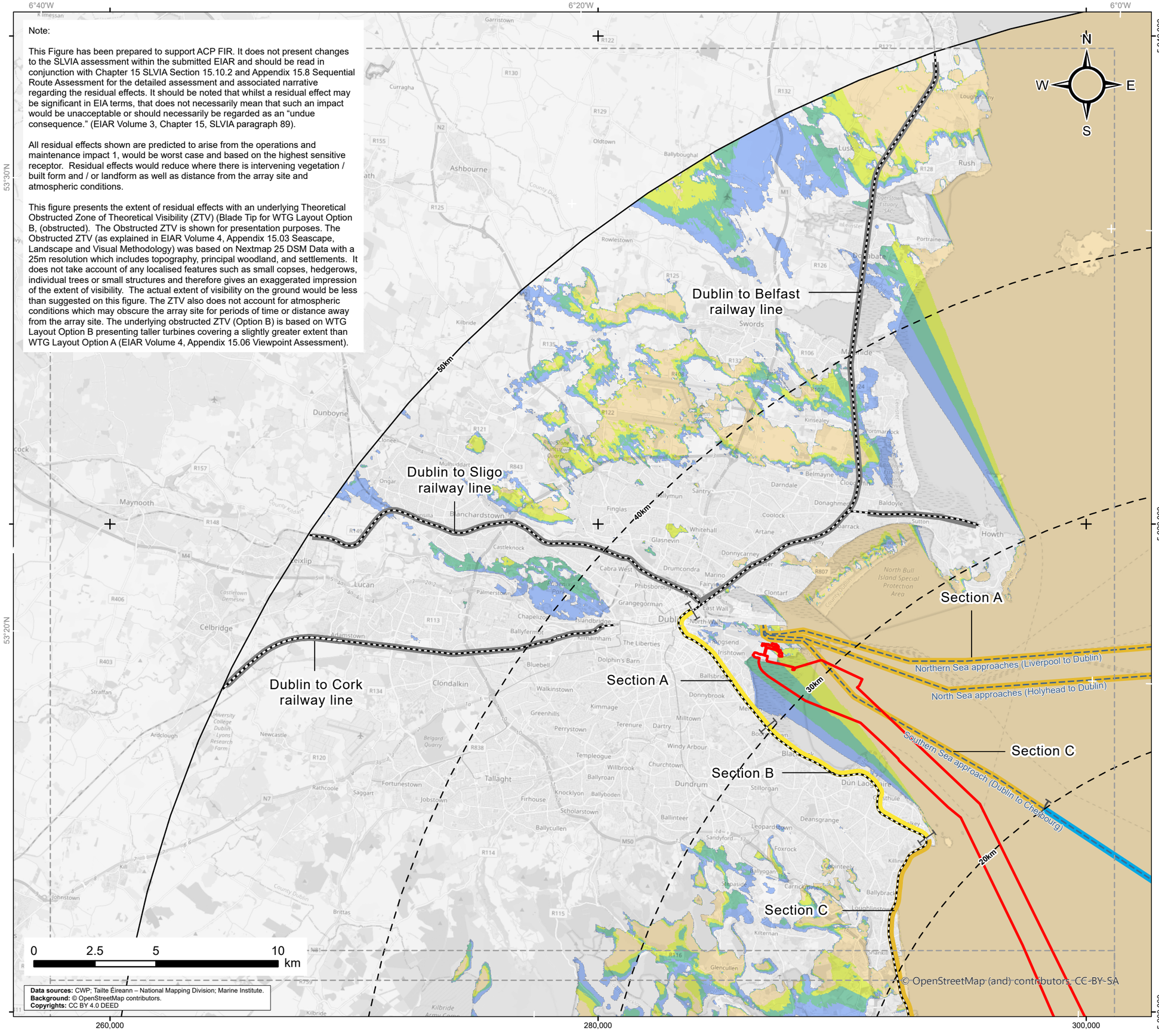
Rev.	Description	Date	By	Chk'd	App'd
A	First issue	2026/01/06	SMc	KSo	MBo

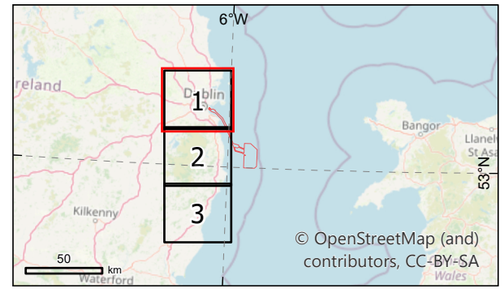
Note:

This Figure has been prepared to support ACP FIR. It does not present changes to the SLVIA assessment within the submitted EIAR and should be read in conjunction with Chapter 15 SLVIA Section 15.10.2 and Appendix 15.8 Sequential Route Assessment for the detailed assessment and associated narrative regarding the residual effects. It should be noted that whilst a residual effect may be significant in EIA terms, that does not necessarily mean that such an impact would be unacceptable or should necessarily be regarded as an "undue consequence." (EIAR Volume 3, Chapter 15, SLVIA paragraph 89).

All residual effects shown are predicted to arise from the operations and maintenance impact 1, would be worst case and based on the highest sensitive receptor. Residual effects would reduce where there is intervening vegetation / built form and / or landform as well as distance from the array site and atmospheric conditions.

This figure presents the extent of residual effects with an underlying Theoretical Obstructed Zone of Theoretical Visibility (ZTV) (Blade Tip for WTG Layout Option B, (obstructed). The Obstructed ZTV is shown for presentation purposes. The Obstructed ZTV (as explained in EIAR Volume 4, Appendix 15.03 Seascape, Landscape and Visual Methodology) was based on Nextmap 25 DSM Data with a 25m resolution which includes topography, principal woodland, and settlements. It does not take account of any localised features such as small copses, hedgerows, individual trees or small structures and therefore gives an exaggerated impression of the extent of visibility. The actual extent of visibility on the ground would be less than suggested on this figure. The ZTV also does not account for atmospheric conditions which may obscure the array site for periods of time or distance away from the array site. The underlying obstructed ZTV (Option B) is based on WTG Layout Option B presenting taller turbines covering a slightly greater extent than WTG Layout Option A (EIAR Volume 4, Appendix 15.06 Viewpoint Assessment).





- Planning Application Boundary (PAB)
- SLVIA study area (50 km buffer of the array site / wind farm site)
- 10 km incremental buffers of array site / wind farm site
- National ferry routes
- Rail routes

Significance of Effect

- Significant-Moderate (significant)
- Moderate (not significant)
- Slight (not significant)
- Not Significant (not significant)
- Not Significant-Imperceptible (not significant)
- Scoped out
- Section breaks along route

Blade tip height Zone of Theoretical Visibility (ZTV) (obstructed)

Number of turbines theoretically visible to blade tip height:

- 1 - 15
- 15 - 30
- 30 - 45
- 45 - 60
- No theoretical visibility

Data sources: CWP; Tailte Éireann – National Mapping Division; Marine Institute.
Background: © OpenStreetMap contributors.
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Project: Codling Wind Park

Contractor: LDĀDESIGN www.lda-design.co.uk

Figure 5b: Summary of residual effects associated with Rail /Ferry routes with Theoretical Obstructed ZTV (Blade Tip for Option B) - North

CWP doc. number: CWP-LDA-ENG-08-01-MAP-2035

Internal descriptive code:

Size: A3
Scale: 1:150,000

CRS: EPSG 25830

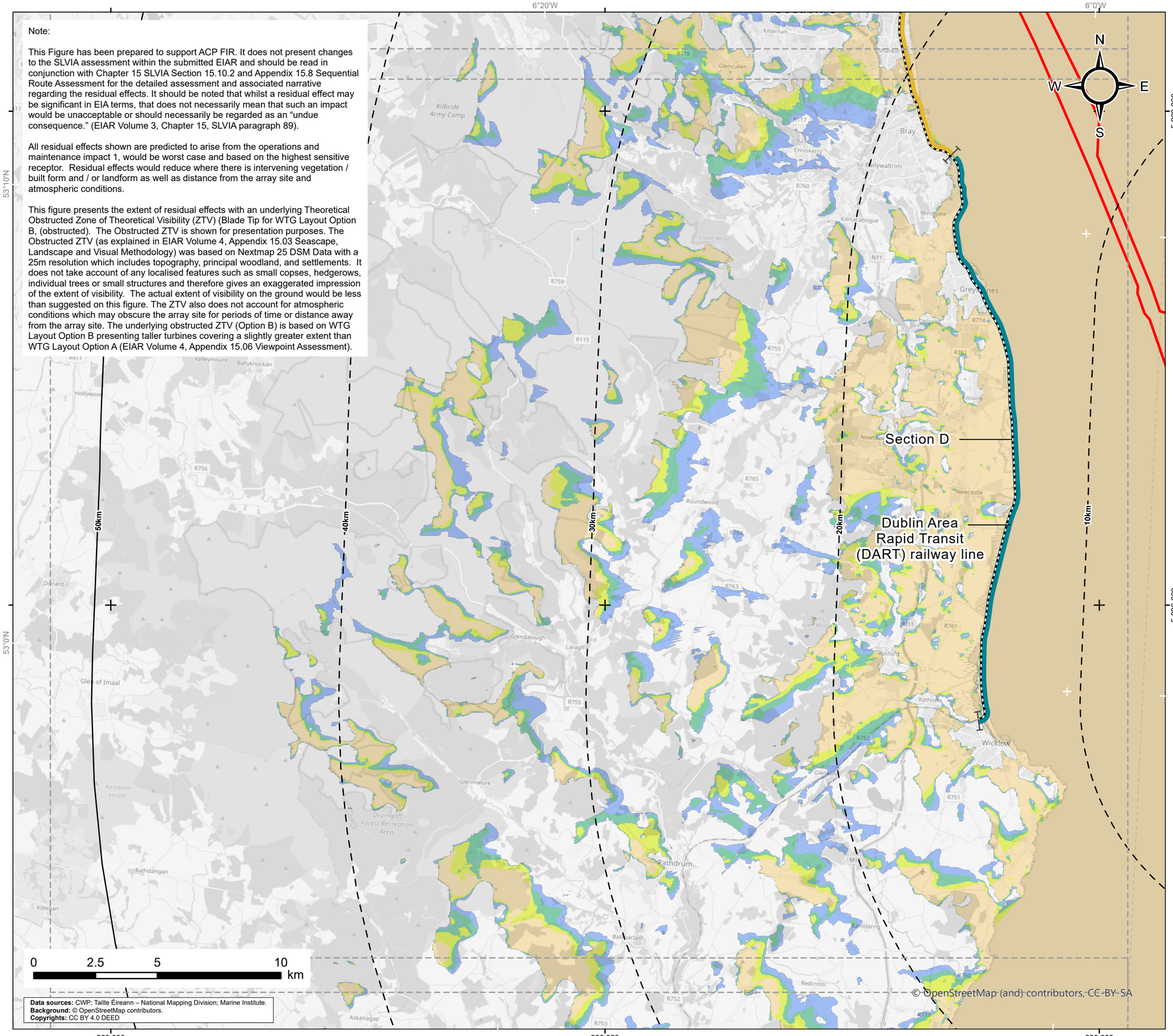
Rev.	Description	Date	By	Chk'd	App'd
A	First issue	2026/01/06	SG	KSo	MBo

Note:

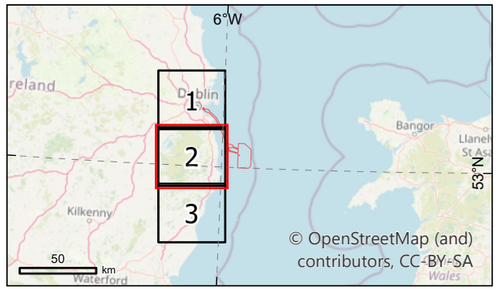
This Figure has been prepared to support ACP FIR. It does not present changes to the SLVIA assessment within the submitted EIAR and should be read in conjunction with Chapter 15 SLVIA Section 15.10.2 and Appendix 15.8 Sequential Route Assessment for the detailed assessment and associated narrative regarding the residual effects. It should be noted that whilst a residual effect may be significant in EIA terms, that does not necessarily mean that such an impact would be unacceptable or should necessarily be regarded as an "undue consequence." (EIAR Volume 3, Chapter 15, SLVIA paragraph 89).

All residual effects shown are predicted to arise from the operations and maintenance impact 1, would be worst case and based on the highest sensitive receptor. Residual effects would reduce where there is intervening vegetation / built form and / or landform as well as distance from the array site and atmospheric conditions.

This figure presents the extent of residual effects with an underlying Theoretical Obstructed Zone of Theoretical Visibility (ZTV) (Blade Tip for WTG Layout Option B, (obstructed). The Obstructed ZTV is shown for presentation purposes. The Obstructed ZTV (as explained in EIAR Volume 4, Appendix 15.03 Seascape, Landscape and Visual Methodology) was based on Nextmap 25 DSM Data with a 25m resolution which includes topography, principal woodland, and settlements. It does not take account of any localised features such as small copses, hedgerows, individual trees or small structures and therefore gives an exaggerated impression of the extent of visibility. The actual extent of visibility on the ground would be less than suggested on this figure. The ZTV also does not account for atmospheric conditions which may obscure the array site for periods of time or distance away from the array site. The underlying obstructed ZTV (Option B) is based on WTG Layout Option B presenting taller turbines covering a slightly greater extent than WTG Layout Option A (EIAR Volume 4, Appendix 15.06 Viewpoint Assessment).



Data sources: CWP; Tailte Éireann – National Mapping Division; Marine Institute.
Background: © OpenStreetMap contributors.
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- Planning Application Boundary (PAB)
- SLVIA study area (50 km buffer of the array site / wind farm site)
- 10 km incremental buffers of array site / wind farm site
- National ferry routes
- Rail routes

Significance of Effect

- Significant-Moderate (significant)
- Moderate (not significant)
- Slight (not significant)
- Not Significant (not significant)
- Not Significant-Imperceptible (not significant)
- Scoped out
- Section breaks along route

Blade tip height Zone of Theoretical Visibility (ZTV) (obstructed)

Number of turbines theoretically visible to blade tip height:

- 1 - 15
- 15 - 30
- 30 - 45
- 45 - 60
- No theoretical visibility

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Project: Codling Wind Park

Contractor: LDĀDESIGN www.lda-design.co.uk

Figure 5c: Summary of residual effects associated with Rail /Ferry routes with Theoretical Obstructed ZTV (Blade Tip for Option B) - Central

Page 2 of 3

CWP doc. number: CWP-LDA-ENG-08-01-MAP-2036

Internal descriptive code:

Size: A3

Scale: 1:150,000

CRS: EPSG 25830

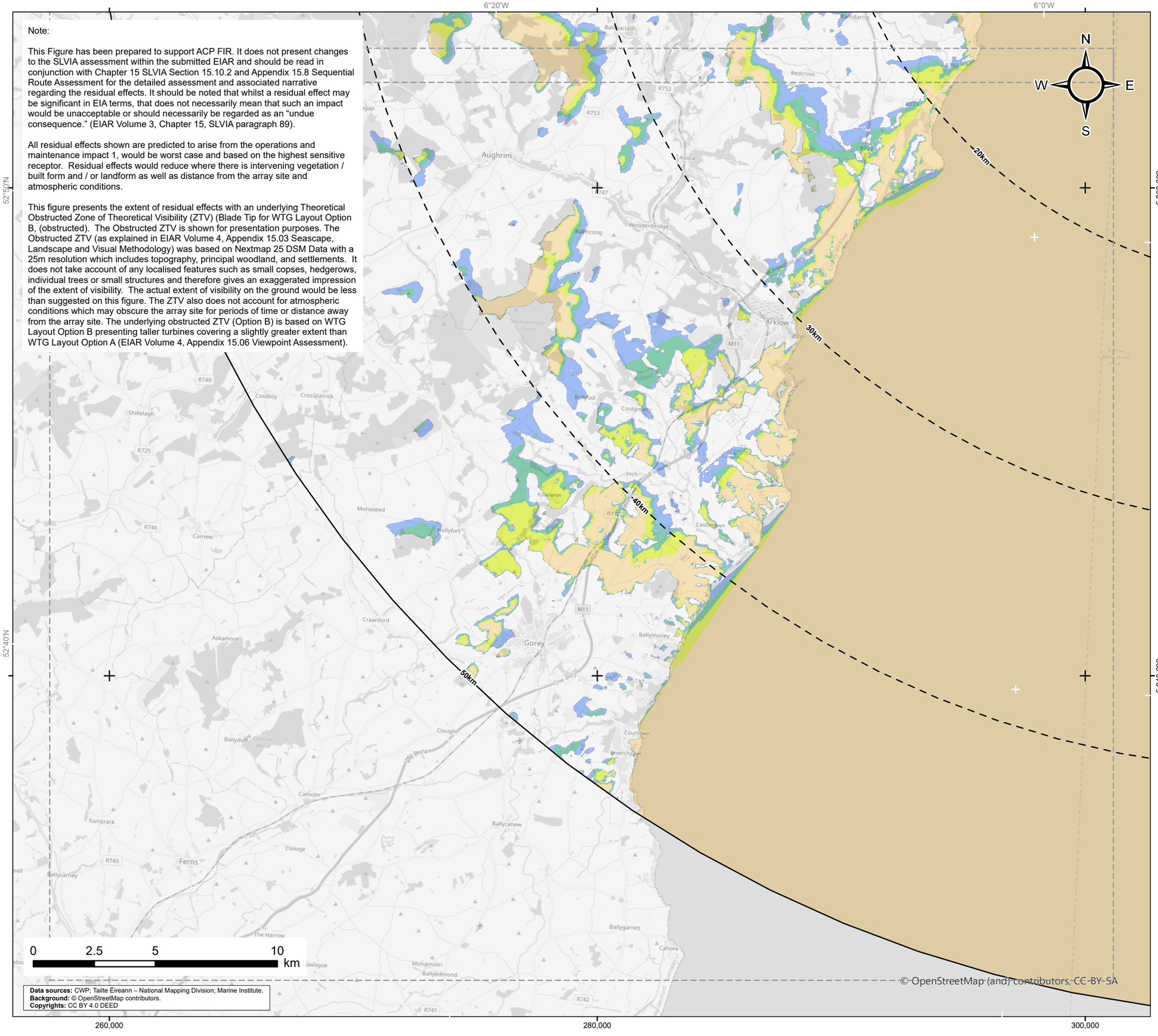
Rev.	Description	Date	By	Chk'd	App'd
A	First issue	2026/01/06	SG	KSo	MBo

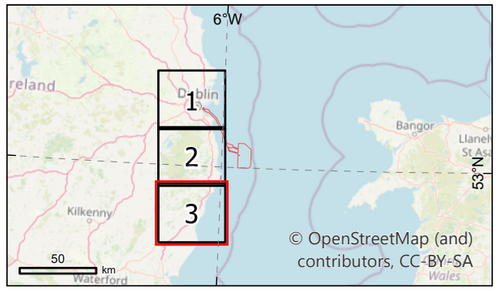
Note:

This Figure has been prepared to support ACP FIR. It does not present changes to the SLVIA assessment within the submitted EIAR and should be read in conjunction with Chapter 15 SLVIA Section 15.10.2 and Appendix 15.8 Sequential Route Assessment for the detailed assessment and associated narrative regarding the residual effects. It should be noted that whilst a residual effect may be significant in EIA terms, that does not necessarily mean that such an impact would be unacceptable or should necessarily be regarded as an "undue consequence." (EIAR Volume 3, Chapter 15, SLVIA paragraph 89).

All residual effects shown are predicted to arise from the operations and maintenance impact 1, would be worst case and based on the highest sensitive receptor. Residual effects would reduce where there is intervening vegetation / built form and / or landform as well as distance from the array site and atmospheric conditions.

This figure presents the extent of residual effects with an underlying Theoretical Obstructed Zone of Theoretical Visibility (ZTV) (Blade Tip for WTG Layout Option B, (obstructed). The Obstructed ZTV is shown for presentation purposes. The Obstructed ZTV (as explained in EIAR Volume 4, Appendix 15.03 Seascape, Landscape and Visual Methodology) was based on Nextmap 25 DSM Data with a 25m resolution which includes topography, principal woodland, and settlements. It does not take account of any localised features such as small copses, hedgerows, individual trees or small structures and therefore gives an exaggerated impression of the extent of visibility. The actual extent of visibility on the ground would be less than suggested on this figure. The ZTV also does not account for atmospheric conditions which may obscure the array site for periods of time or distance away from the array site. The underlying obstructed ZTV (Option B) is based on WTG Layout Option B presenting taller turbines covering a slightly greater extent than WTG Layout Option A (EIAR Volume 4, Appendix 15.06 Viewpoint Assessment).





- Planning Application Boundary (PAB)
- SLVIA study area (50 km buffer of the array site / wind farm site)
- 10 km incremental buffers of array site / wind farm site
- National ferry routes
- Rail routes

Significance of Effect

- Significant-Moderate (significant)
- Moderate (not significant)
- Slight (not significant)
- Not Significant (not significant)
- Not Significant-Imperceptible (not significant)
- Scoped out
- Section breaks along route

Blade tip height Zone of Theoretical Visibility (ZTV) (obstructed)

Number of turbines theoretically visible to blade tip height:

- 1 - 15
- 15 - 30
- 30 - 45
- 45 - 60
- No theoretical visibility

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Project: Codling Wind Park

Contractor: LDA DESIGN www.lda-design.co.uk

Figure 5d: Summary of residual effects associated with Settlements with Theoretical Obstructed ZTV (Blade Tip for Option B) - South

Page 3 of 3

CWP doc. number: CWP-LDA-ENG-08-01-MAP-2037

Internal descriptive code:

Size: A3

Scale: 1:150,000

CRS: EPSG 25830

Rev.	Description	Date	By	Chk'd	App'd
A	First issue	2026/01/06	SG	KSo	MBo

ID	South Dublin LCAs	Effect
SD1	Liffey Valley	SO
SD2	Newcastle Lowlands	SO
SD3	Athgoe and Saggart Hills	SO
SD4	River Dodder and Glensamole Valley	NS (ns)
SD5	Urban	SO

ID	Dun Laoghaire TCAs	Effect
DLT1	Booterstown / Blackrock	SO
DLT2	Dún Laoghaire / Monkstown	NS (ns)
DLT3	Sandycove	SO
DLT4	Dalkey	S (ns)
DLT6	Killiney Bay	M (ns)
DLT7	Shankill	M (ns)
DLT8	Loughlinstown Commons / Ballybrack	NS (ns)
DLT9	Carrick Mines Wood	I (ns)
DLT10	Woodside / Ballyogan	NS (ns)

ID	Wicklow LAs	Effect
WiL1a	The Mountain Uplands	M-S (ns)
WiL1b	The Blessington Lakes Area	SO
WiL1c	The Bray Mountain Group	S (s)
WiL1d	The North Eastern Valley	M (ns)
WiL2a	The Northern Coastal Area	S (s)
WiL2b	The Southern Coastal Area	S (s)
WiL3a	North East Mountain Lowlands	M (ns)
WiL3b	South East Mountain Lowlands	M (ns)
WiL3c	Southern Hills	M-S (ns)
WiL3e	Transitional Lands	SO
WiL4a	NR11	S (ns)
WiL4b	N81	SO
WiL5	Rolling Lowland Areas 1-6	S (ns)

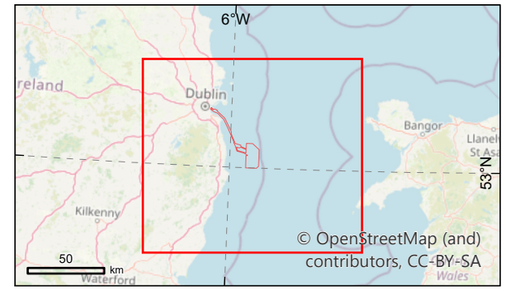
ID	Wexford LCUs	Effect
W1	Uplands	S (ns)
W2	Lowlands	M-S (ns)
W4	Coastal	S (ns)
W5a	Distinctive Landscape (Kilmichael Point)	S (ns)
W5b	Distinctive Landscape (Ask Hill)	S (ns)
W5c	Distinctive Landscape (Tara Hill)	S (ns)
W5d	Distinctive Landscape (Ballyminaun Hill)	S (ns)

ID	Wicklow TCAs	Effect
WiT6a	Urban - Greystones	M (ns)
WiT6b	Urban - Kilcoole	S (ns)
WiT6c	Urban - Newcastle	S (ns)
WiT6d	Urban - Wicklow	M (ns)
WiT6e	Urban - Blessington	SO
WiT6f	Urban - Roundwood	SO
WiT6g	Urban - Newton Mount Kennedy	SO
WiT6j	Urban - Tinahely	SO
WiT6k	Urban - Aughrim	SO
WiT6l	Urban - Arklow	NS (ns)
WiT6m	Urban - Avoca	SO
WiT6n	Urban - Rathdrum	SO
WiT6r	Urban - Ashford	SO
WiT6s	Urban - Laragh	SO
WiT6t	Urban - Killmanogue	SO
WiT6u	Urban - Enniskerry	SO
WiT6v	Urban - Bray	NS (ns)

ID	Dublin TCAs	Effect
D1	Clontarf	SO
D2	Dublin Docklands	I (ns)
D3	East Wall	SO
D4	South Docklands, Irishtown and Ringsend	SO
D6	North Bull Island	M-S (ns)
D7	Poolbeg Peninsula	NS (ns)
D8	Sandymount	S (ns)
D9	Kilbarrack and Baldoyle	SO
D10	St Anne's Park	S (ns)
D11	River Liffey	SO
D12	Phoenix Park	SO

ID	Fingal LCAs	Effect
F1a	Coastal (Rush)	NS (ns)
F1b	Coastal (Portrane)	NS (ns)
F1c	Coastal (Portmarnock)	NS (ns)
F1d	Coastal (Howth)	M-S (ns)
F1e	Coastal (Irelands Eye)	M-S (ns)
F1f	Coastal (Lambay Island)	S (ns)
F2a	Estuary (Rogerstown)	NS (ns)
F2b	Estuary (Swords / Malahide)	NS (ns)
F2c	Estuary (Baldoyle)	NS (ns)
F3	High Lying Agricultural Land	NS (ns)
F4a	Low Lying Agricultural Land (Dublin airport)	I (ns)
F4b	Low Lying Agricultural (Lusk)	I (ns)
F5	Rolling Hills with Tree Belts	NS (ns)
F6	River Valleys / Canals (Tolka and Liffey Valleys)	NS (ns)

ID	Dun Laoghaire LCAs	Effect
DLL1	Kilmashogue Valley	SO
DLL2	Western Half of Kellystown Road	SO
DLL3	Ticknock Road	SO
DLL4	Marlay Park	SO
DLL5	Kiltiernan Plain	S (ns)
DLL6	Ballycorus	S (ns)
DLL7	Glencullen Valley	S (ns)
DLL8	Glendoo Valley	S (ns)
DLL9	Barnacullia	NS (ns)
DLL10	Rathmichael	M (ns)
DLL11	Ballyman	M (ns)
DLL12	Shanganagh	M (ns)
DLL13	Carrickmines	I (ns)
DLL14	Cherrywood/Rathmichael	NS (ns)



- Planning Application Boundary (PAB)
- SLVIA study area (50 km buffer of the array site / wind farm site)
- 10 km incremental buffers of array site / wind farm site

Significance of Effect

- Significant (significant) / S (s)
- Moderate (not significant) / M (ns)
- Moderate-Slight (not significant) / M-S (ns)
- Slight (not significant) / S (ns)
- Not Significant (not significant) / NS (ns)
- Imperceptible (not significant) / I (ns)
- Scoped out / SO

Note:

This Figure has been prepared to support ACP FIR. It does not present changes to the SLVIA assessment within the submitted EIAR and should be read in conjunction with Chapter 15 SLVIA Section 15.10.2 and Appendix 15.5 Landscape Character Assessment for the detailed assessment and associated narrative regarding the residual effects. It should be noted that whilst a residual effect may be significant in EIA terms, that does not necessarily mean that such an impact would be unacceptable or should necessarily be regarded as an "undue consequence." (EIAR Volume 3, Chapter 15, SLVIA paragraph 89).

All residual effects shown are predicted to arise from the operations and maintenance impact 1, would be worst case and based on the highest sensitive receptor. Residual effects would reduce where there is intervening vegetation / built form and / or landform as well as distance from the array site and atmospheric conditions.

Data sources: CWP; Tailte Éireann – National Mapping Division; Fingal County Council; Dún Laoghaire-Rathdown County Council; Wicklow County Council; Wexford County Council
Background: © OpenStreetMap contributors.
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codling wind park

Project: Codling Wind Park

Contractor: LDĀDESIGN www.lda-design.co.uk

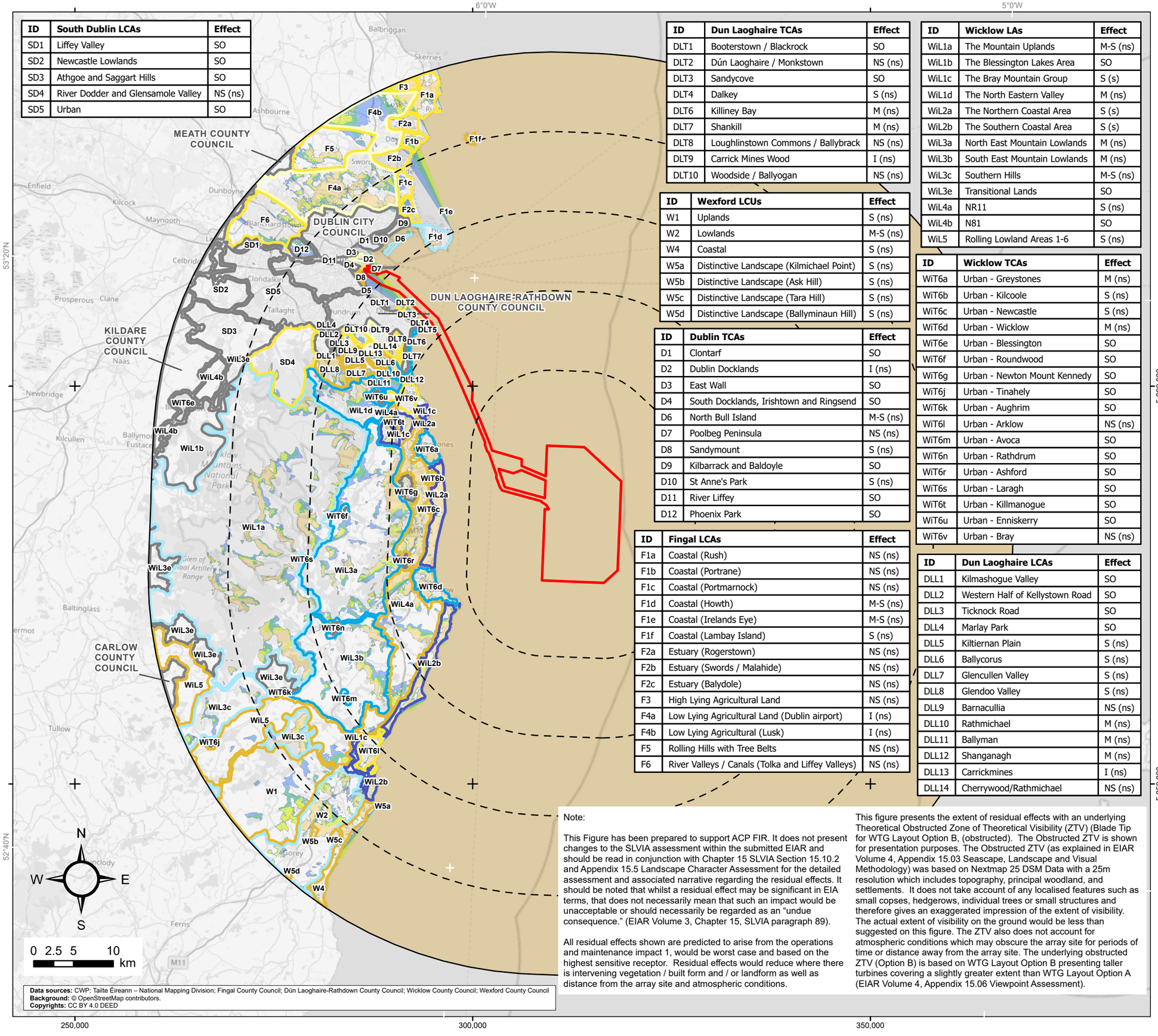
Figure 6: Summary of residual effects associated with Landscape and Townscape Character

CWP doc. number: CWP-LDA-ENG-08-01-MAP-2038

Internal descriptive code: ALL - PAB, WF.BUFF.50km. LCAs.TCAs.460K - EIAR.FIG.15.05

Size: A3 *Scale:* 1:460,000 *CRS:* EPSG 25830

Rev.	Description	Date	By	Chk'd	App'd
A	First issue	2026/01/06	SG	KSo	MBo



ID	South Dublin LCAs	Effect
SD1	Liffey Valley	SO
SD2	Newcastle Lowlands	SO
SD3	Athgoe and Saggart Hills	SO
SD4	River Dodder and Glensamole Valley	NS (ns)
SD5	Urban	SO

ID	Dun Laoghaire TCAs	Effect
DLT1	Booterstown / Blackrock	SO
DLT2	Dún Laoghaire / Monkstown	NS (ns)
DLT3	Sandycove	SO
DLT4	Dalkey	S (ns)
DLT6	Killiney Bay	M (ns)
DLT7	Shankill	M (ns)
DLT8	Loughlinstown Commons / Ballybrack	NS (ns)
DLT9	Carrick Mines Wood	I (ns)
DLT10	Woodside / Ballyogan	NS (ns)

ID	Wicklow LAs	Effect
WiL1a	The Mountain Uplands	M-S (ns)
WiL1b	The Blessington Lakes Area	SO
WiL1c	The Bray Mountain Group	S (s)
WiL1d	The North Eastern Valley	M (ns)
WiL2a	The Northern Coastal Area	S (s)
WiL2b	The Southern Coastal Area	S (s)
WiL3a	North East Mountain Lowlands	M (ns)
WiL3b	South East Mountain Lowlands	M (ns)
WiL3c	Southern Hills	M-S (ns)
WiL3e	Transitional Lands	SO
WiL4a	NR11	S (ns)
WiL4b	N81	SO
WiL5	Rolling Lowland Areas 1-6	S (ns)

ID	Wexford LCUs	Effect
W1	Uplands	S (ns)
W2	Lowlands	M-S (ns)
W4	Coastal	S (ns)
W5a	Distinctive Landscape (Kilmichael Point)	S (ns)
W5b	Distinctive Landscape (Ask Hill)	S (ns)
W5c	Distinctive Landscape (Tara Hill)	S (ns)
W5d	Distinctive Landscape (Ballyminaun Hill)	S (ns)

ID	Wicklow TCAs	Effect
WiT6a	Urban - Greystones	M (ns)
WiT6b	Urban - Kilcoole	S (ns)
WiT6c	Urban - Newcastle	S (ns)
WiT6d	Urban - Wicklow	M (ns)
WiT6e	Urban - Blessington	SO
WiT6f	Urban - Roundwood	SO
WiT6g	Urban - Newton Mount Kennedy	SO
WiT6j	Urban - Tinahely	SO
WiT6k	Urban - Aughrim	SO
WiT6l	Urban - Arklow	NS (ns)
WiT6m	Urban - Avoca	SO
WiT6n	Urban - Rathdrum	SO
WiT6r	Urban - Ashford	SO
WiT6s	Urban - Laragh	SO
WiT6t	Urban - Killmanogue	SO
WiT6u	Urban - Enniskerry	SO
WiT6v	Urban - Bray	NS (ns)

ID	Dublin TCAs	Effect
D1	Clontarf	SO
D2	Dublin Docklands	I (ns)
D3	East Wall	SO
D4	South Docklands, Irishtown and Ringsend	SO
D6	North Bull Island	M-S (ns)
D7	Poolbeg Peninsula	NS (ns)
D8	Sandymount	S (ns)
D9	Kilbarrack and Baldoyle	SO
D10	St Anne's Park	S (ns)
D11	River Liffey	SO
D12	Phoenix Park	SO

ID	Fingal LCAs	Effect
F1a	Coastal (Rush)	NS (ns)
F1b	Coastal (Portrane)	NS (ns)
F1c	Coastal (Portmarnock)	NS (ns)
F1d	Coastal (Howth)	M-S (ns)
F1e	Coastal (Irelands Eye)	M-S (ns)
F1f	Coastal (Lambay Island)	S (ns)
F2a	Estuary (Rogerstown)	NS (ns)
F2b	Estuary (Swords / Malahide)	NS (ns)
F2c	Estuary (Baldoyle)	NS (ns)
F3	High Lying Agricultural Land	NS (ns)
F4a	Low Lying Agricultural Land (Dublin airport)	I (ns)
F4b	Low Lying Agricultural (Lusk)	I (ns)
F5	Rolling Hills with Tree Belts	NS (ns)
F6	River Valleys / Canals (Tolka and Liffey Valleys)	NS (ns)

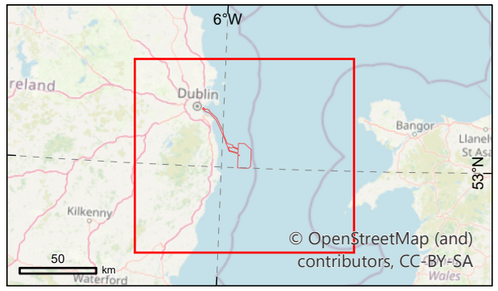
ID	Dun Laoghaire LCAs	Effect
DLL1	Kilmashogue Valley	SO
DLL2	Western Half of Kellystown Road	SO
DLL3	Ticknock Road	SO
DLL4	Marlay Park	SO
DLL5	Kiltiernan Plain	S (ns)
DLL6	Ballycorus	S (ns)
DLL7	Glencullen Valley	S (ns)
DLL8	Glendoo Valley	S (ns)
DLL9	Barnacullia	NS (ns)
DLL10	Rathmichael	M (ns)
DLL11	Ballyman	M (ns)
DLL12	Shanganagh	M (ns)
DLL13	Carrickmines	I (ns)
DLL14	Cherrywood/Rathmichael	NS (ns)

Note:

This Figure has been prepared to support ACP FIR. It does not present changes to the SLVIA assessment within the submitted EIAR and should be read in conjunction with Chapter 15 SLVIA Section 15.10.2 and Appendix 15.5 Landscape Character Assessment for the detailed assessment and associated narrative regarding the residual effects. It should be noted that whilst a residual effect may be significant in EIA terms, that does not necessarily mean that such an impact would be unacceptable or should necessarily be regarded as an "undue consequence." (EIAR Volume 3, Chapter 15, SLVIA paragraph 89).

All residual effects shown are predicted to arise from the operations and maintenance impact 1, would be worst case and based on the highest sensitive receptor. Residual effects would reduce where there is intervening vegetation / built form and / or landform as well as distance from the array site and atmospheric conditions.

This figure presents the extent of residual effects with an underlying Theoretical Obstructed Zone of Theoretical Visibility (ZTV) (Blade Tip for WTG Layout Option B, (obstructed). The Obstructed ZTV is shown for presentation purposes. The Obstructed ZTV (as explained in EIAR Volume 4, Appendix 15.03 Seascape, Landscape and Visual Methodology) was based on Nextmap 25 DSM Data with a 25m resolution which includes topography, principal woodland, and settlements. It does not take account of any localised features such as small copses, hedgerows, individual trees or small structures and therefore gives an exaggerated impression of the extent of visibility. The actual extent of visibility on the ground would be less than suggested on this figure. The ZTV also does not account for atmospheric conditions which may obscure the array site for periods of time or distance away from the array site. The underlying obstructed ZTV (Option B) is based on WTG Layout Option B presenting taller turbines covering a slightly greater extent than WTG Layout Option A (EIAR Volume 4, Appendix 15.06 Viewpoint Assessment).



Planning Application Boundary (PAB)

SLVIA study area (50 km buffer of the array site / wind farm site)

10 km incremental buffers of array site / wind farm site

Significance of Effect

- Significant (significant) / S (s)
- Moderate (not significant) / M (ns)
- Moderate-Slight (not significant) / M-S (ns)
- Slight (not significant) / S (ns)
- Not Significant (not significant) / NS (ns)
- Imperceptible (not significant) / I (ns)
- Scoped out / SO

Blade tip height Zone of Theoretical Visibility (ZTV) (obstructed)

Number of turbines theoretically visible to blade tip height:

- 1 - 15
- 15 - 30
- 30 - 45
- 45 - 60
- No theoretical visibility

Data sources: CWP; Tailte Éireann – National Mapping Division; Fingal County Council; Dún Laoghaire-Rathdown County Council; Wicklow County Council; Wexford County Council
Background: © OpenStreetMap contributors.
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Contractor: LDĀDESIGN www.lda-design.co.uk

Figure 6a: Summary of residual effects associated with Landscape and Townscape Character with Theoretical Obstructed ZTV (Blade Tip for Option B)

CWP doc. number: CWP-LDA-ENG-08-01-MAP-2039

Internal descriptive code: ALL - PAB..WF.BUFF.50km..LCAs.TCAs.460K - EIAR.FIG.15.05

Size: A3

Scale: 1:460,000

CRS: EPSG 25830

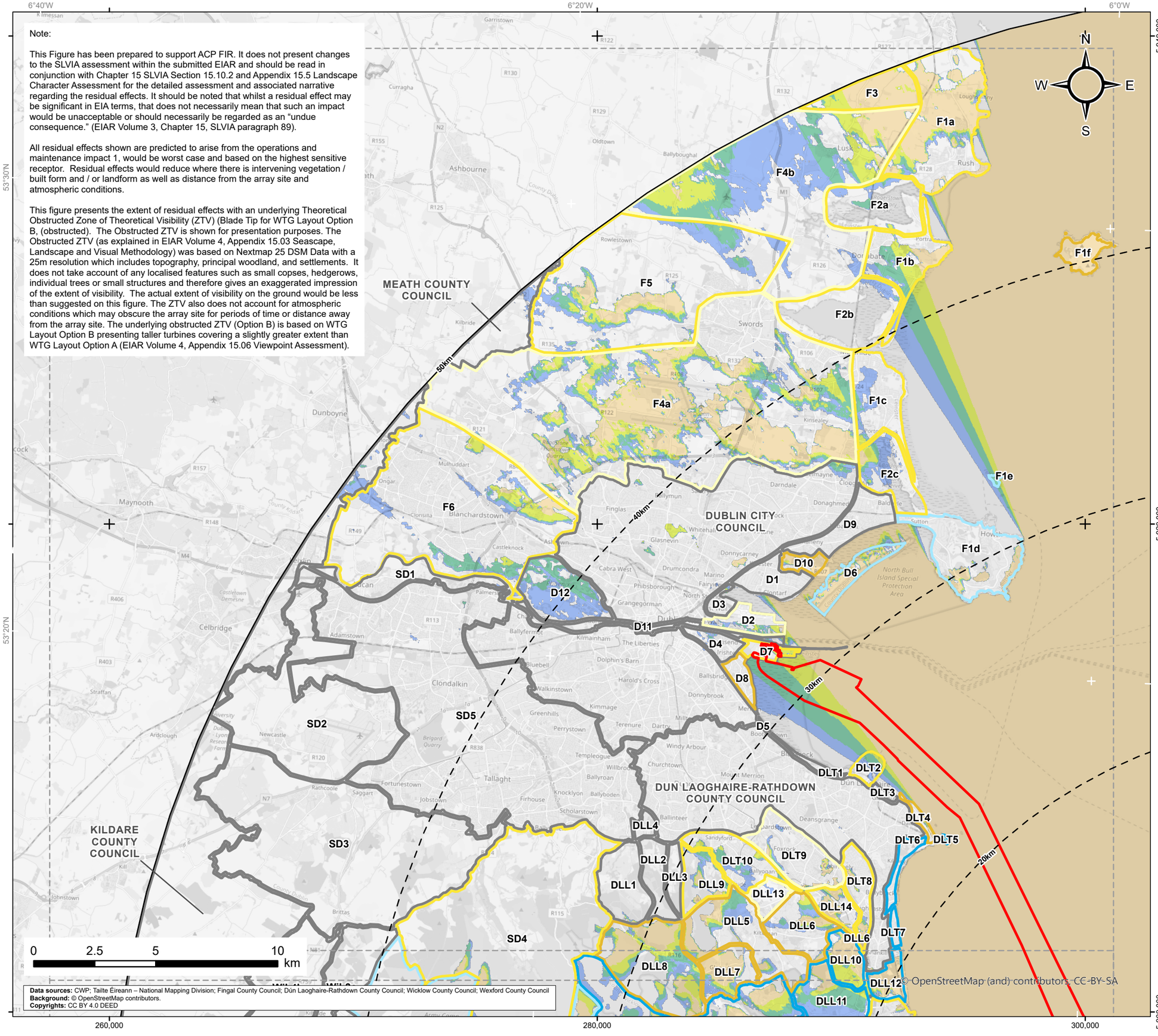
Rev.	Description	Date	By	Chk'd	App'd
A	First issue	2026/01/06	SG	KSo	MBo

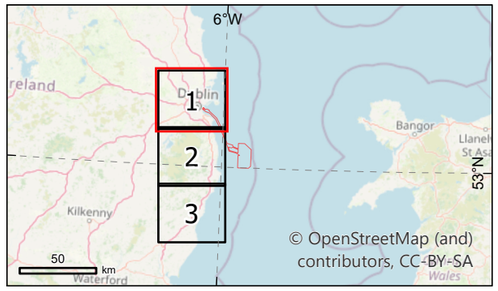
Note:

This Figure has been prepared to support ACP FIR. It does not present changes to the SLVIA assessment within the submitted EIAR and should be read in conjunction with Chapter 15 SLVIA Section 15.10.2 and Appendix 15.5 Landscape Character Assessment for the detailed assessment and associated narrative regarding the residual effects. It should be noted that whilst a residual effect may be significant in EIA terms, that does not necessarily mean that such an impact would be unacceptable or should necessarily be regarded as an "undue consequence." (EIAR Volume 3, Chapter 15, SLVIA paragraph 89).

All residual effects shown are predicted to arise from the operations and maintenance impact 1, would be worst case and based on the highest sensitive receptor. Residual effects would reduce where there is intervening vegetation / built form and / or landform as well as distance from the array site and atmospheric conditions.

This figure presents the extent of residual effects with an underlying Theoretical Obstructed Zone of Theoretical Visibility (ZTV) (Blade Tip for WTG Layout Option B, (obstructed). The Obstructed ZTV is shown for presentation purposes. The Obstructed ZTV (as explained in EIAR Volume 4, Appendix 15.03 Seascape, Landscape and Visual Methodology) was based on Nextmap 25 DSM Data with a 25m resolution which includes topography, principal woodland, and settlements. It does not take account of any localised features such as small copses, hedgerows, individual trees or small structures and therefore gives an exaggerated impression of the extent of visibility. The actual extent of visibility on the ground would be less than suggested on this figure. The ZTV also does not account for atmospheric conditions which may obscure the array site for periods of time or distance away from the array site. The underlying obstructed ZTV (Option B) is based on WTG Layout Option B presenting taller turbines covering a slightly greater extent than WTG Layout Option A (EIAR Volume 4, Appendix 15.06 Viewpoint Assessment).





Planning Application Boundary (PAB)

SLVIA study area (50 km buffer of the array site / wind farm site)

10 km incremental buffers of array site / wind farm site

Landscape and townscape character

- Significant (significant) / S (s)
- Moderate (not significant) / M (ns)
- Moderate-Slight (not significant) / M-S (ns)
- Slight (not significant) / S (ns)
- Not Significant (not significant) / NS (ns)
- Imperceptible (not significant) / I (ns)
- Scoped out / SO

Blade tip height Zone of Theoretical Visibility (ZTV) (obstructed)

Number of turbines theoretically visible to blade tip height:

- 1 - 15
- 15 - 30
- 30 - 45
- 45 - 60
- No theoretical visibility

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Figure 6b: Summary of residual effects associated with Landscape and Townscape Character with Theoretical Obstructed ZTV (Blade Tip for Option B) - North

CWP doc. number: CWP-LDA-ENG-08-01-MAP-2040

Internal descriptive code: ONSH.ALL - PAB..WF.BUFF.50km..LCAs.TCAs.150K - EIAR.FIG.15.06

Size: A3

Scale: 1:150,000

CRS: EPSG 25830

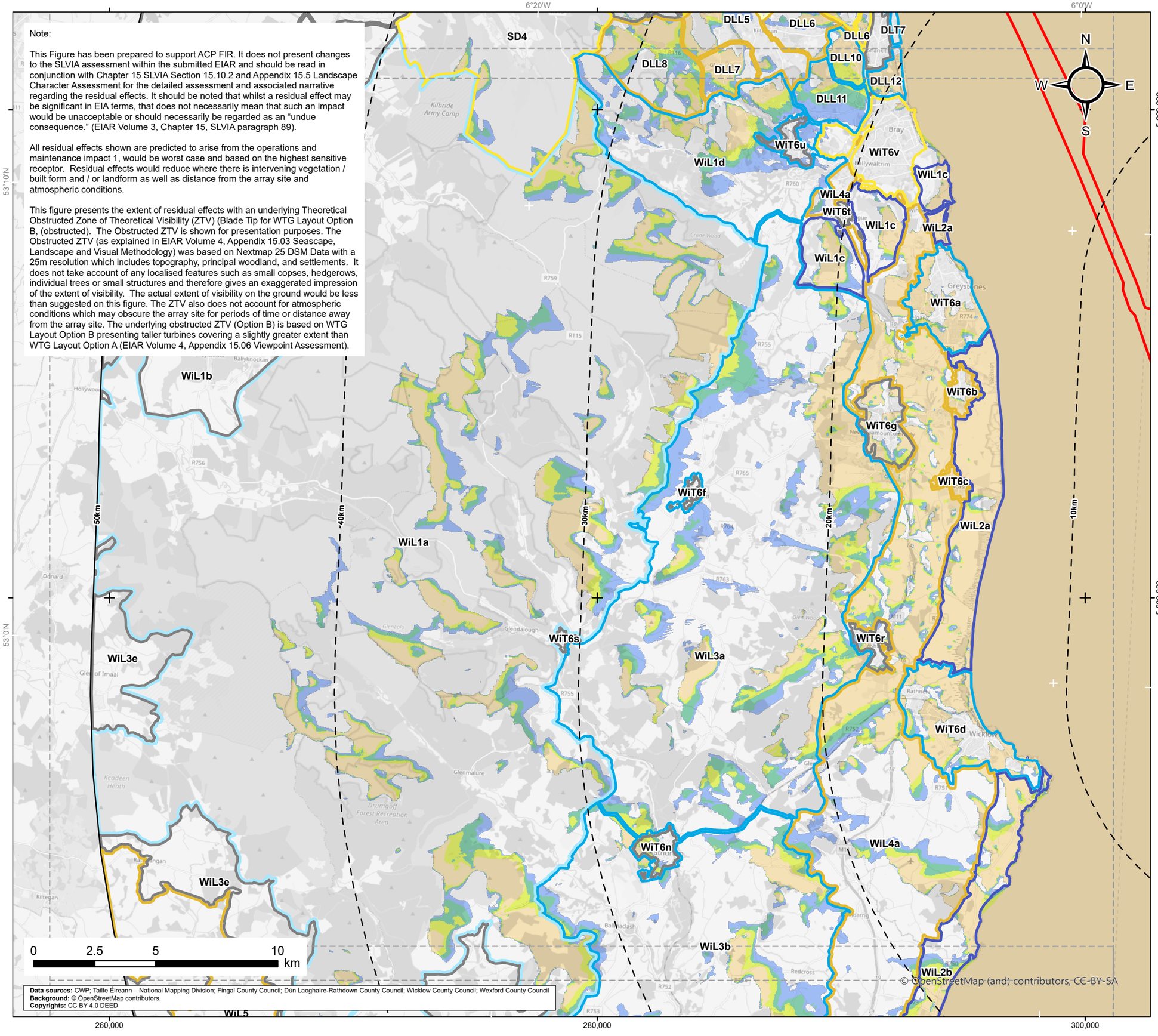
Rev.	Description	Date	By	Chk'd	App'd
A	First issue	2026/01/06	SG	KSo	MBo

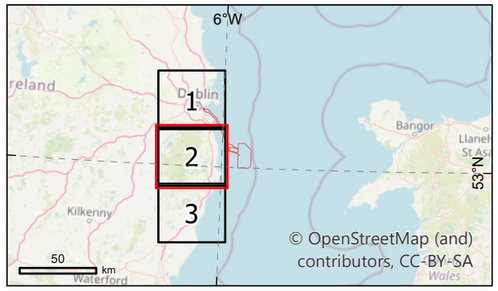
Note:

This Figure has been prepared to support ACP FIR. It does not present changes to the SLVIA assessment within the submitted EIAR and should be read in conjunction with Chapter 15 SLVIA Section 15.10.2 and Appendix 15.5 Landscape Character Assessment for the detailed assessment and associated narrative regarding the residual effects. It should be noted that whilst a residual effect may be significant in EIA terms, that does not necessarily mean that such an impact would be unacceptable or should necessarily be regarded as an "undue consequence." (EIAR Volume 3, Chapter 15, SLVIA paragraph 89).

All residual effects shown are predicted to arise from the operations and maintenance impact 1, would be worst case and based on the highest sensitive receptor. Residual effects would reduce where there is intervening vegetation / built form and / or landform as well as distance from the array site and atmospheric conditions.

This figure presents the extent of residual effects with an underlying Theoretical Obstructed Zone of Theoretical Visibility (ZTV) (Blade Tip for WTG Layout Option B, (obstructed). The Obstructed ZTV is shown for presentation purposes. The Obstructed ZTV (as explained in EIAR Volume 4, Appendix 15.03 Seascape, Landscape and Visual Methodology) was based on Nextmap 25 DSM Data with a 25m resolution which includes topography, principal woodland, and settlements. It does not take account of any localised features such as small copses, hedgerows, individual trees or small structures and therefore gives an exaggerated impression of the extent of visibility. The actual extent of visibility on the ground would be less than suggested on this figure. The ZTV also does not account for atmospheric conditions which may obscure the array site for periods of time or distance away from the array site. The underlying obstructed ZTV (Option B) is based on WTG Layout Option B presenting taller turbines covering a slightly greater extent than WTG Layout Option A (EIAR Volume 4, Appendix 15.06 Viewpoint Assessment).





- Planning Application Boundary (PAB)
- SLVIA study area (50 km buffer of the array site / wind farm site)
- 10 km incremental buffers of array site / wind farm site

Landscape and townscape character
- Significant (significant) / S (s)
- Moderate (not significant) / M (ns)
- Moderate-Slight (not significant) / M-S (ns)
- Slight (not significant) / S (ns)
- Not Significant (not significant) / NS (ns)
- Imperceptible (not significant) / I (ns)
- Scoped out / SO

Blade tip height Zone of Theoretical Visibility (ZTV) (obstructed)

Number of turbines theoretically visible to blade tip height:
- 1 - 15
- 15 - 30
- 30 - 45
- 45 - 60
- No theoretical visibility

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Figure 6c: Summary of residual effects associated with Landscape and Townscape Character with Theoretical Obstructed ZTV (Blade Tip for Option B) - Central

CWP doc. number: CWP-LDA-ENG-08-01-MAP-2041

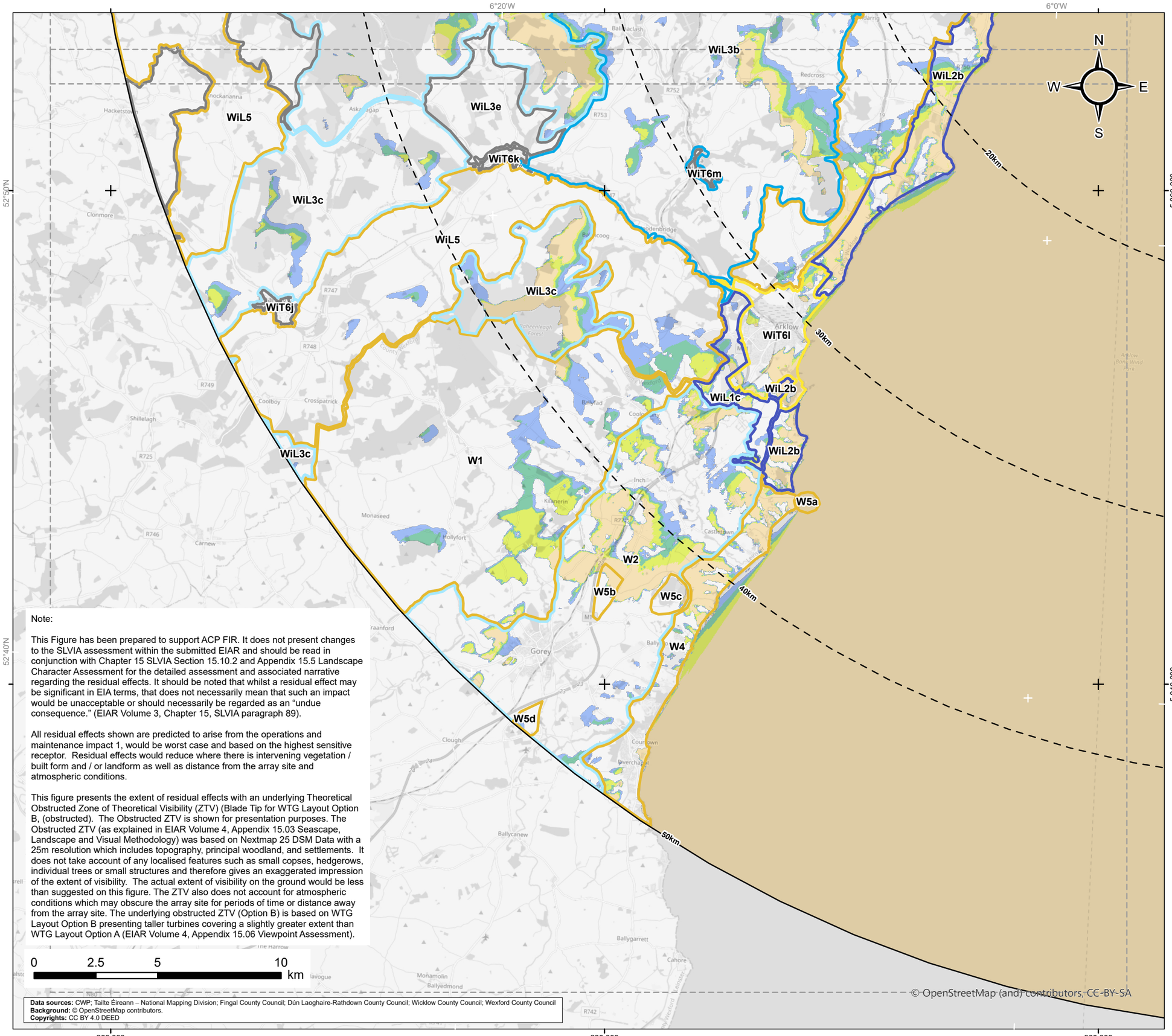
Internal descriptive code: ONSH.ALL - PAB..WF.BUFF.50km..LCAs.TCAs.150K - EIAR.FIG.15.06

Size: A3

Scale: 1:150,000

CRS: EPSG 25830

Rev.	Description	Date	By	Chk'd	App'd
A	First issue	2026/01/06	SG	KSo	MBo



Note:

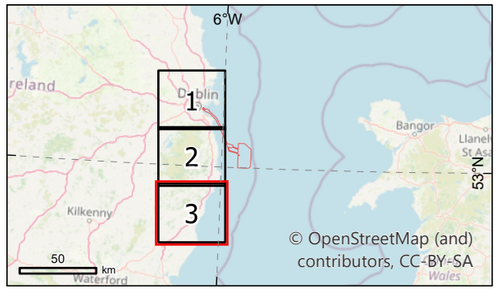
This Figure has been prepared to support ACP FIR. It does not present changes to the SLVIA assessment within the submitted EIAR and should be read in conjunction with Chapter 15 SLVIA Section 15.10.2 and Appendix 15.5 Landscape Character Assessment for the detailed assessment and associated narrative regarding the residual effects. It should be noted that whilst a residual effect may be significant in EIA terms, that does not necessarily mean that such an impact would be unacceptable or should necessarily be regarded as an "undue consequence." (EIAR Volume 3, Chapter 15, SLVIA paragraph 89).

All residual effects shown are predicted to arise from the operations and maintenance impact 1, would be worst case and based on the highest sensitive receptor. Residual effects would reduce where there is intervening vegetation / built form and / or landform as well as distance from the array site and atmospheric conditions.

This figure presents the extent of residual effects with an underlying Theoretical Obstructed Zone of Theoretical Visibility (ZTV) (Blade Tip for WTG Layout Option B, (obstructed). The Obstructed ZTV is shown for presentation purposes. The Obstructed ZTV (as explained in EIAR Volume 4, Appendix 15.03 Seascape, Landscape and Visual Methodology) was based on Nextmap 25 DSM Data with a 25m resolution which includes topography, principal woodland, and settlements. It does not take account of any localised features such as small copses, hedgerows, individual trees or small structures and therefore gives an exaggerated impression of the extent of visibility. The actual extent of visibility on the ground would be less than suggested on this figure. The ZTV also does not account for atmospheric conditions which may obscure the array site for periods of time or distance away from the array site. The underlying obstructed ZTV (Option B) is based on WTG Layout Option B presenting taller turbines covering a slightly greater extent than WTG Layout Option A (EIAR Volume 4, Appendix 15.06 Viewpoint Assessment).

Data sources: CWP; Tailte Éireann – National Mapping Division; Fingal County Council; Dún Laoghaire-Rathdown County Council; Wicklow County Council; Wexford County Council
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- Planning Application Boundary (PAB)
- SLVIA study area (50 km buffer of the array site / wind farm site)
- 10 km incremental buffers of array site / wind farm site

Landscape and townscape character
- Significant (significant) / S (s)
- Moderate (not significant) / M (ns)
- Moderate-Slight (not significant) / M-S (ns)
- Slight (not significant) / S (ns)
- Not Significant (not significant) / NS (ns)
- Imperceptible (not significant) / I (ns)
- Scoped out / SO

Blade tip height Zone of Theoretical Visibility (ZTV) (obstructed)

Number of turbines theoretically visible to blade tip height:
- 1 - 15
- 15 - 30
- 30 - 45
- 45 - 60
- No theoretical visibility

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Project: Codling Wind Park

Contractor: LDĀDESIGN www.lda-design.co.uk

Figure 6d: Summary of residual effects associated with Landscape and Townscape Character with Theoretical Obstructed ZTV (Blade Tip for Option B) - South

CWP doc. number: CWP-LDA-ENG-08-01-MAP-2042

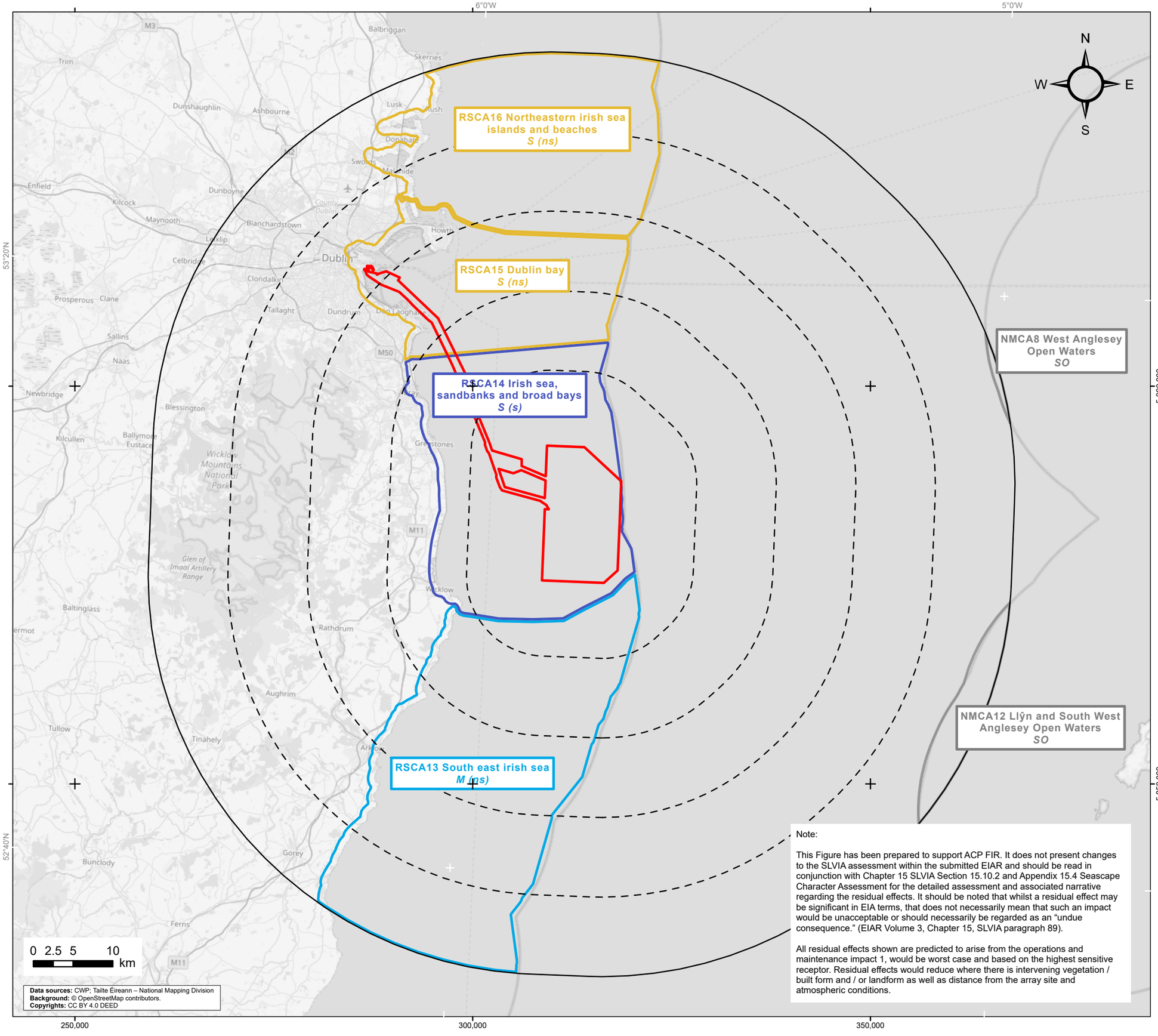
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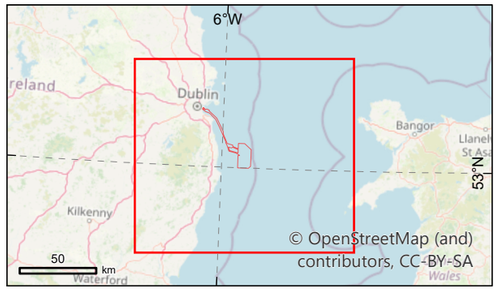
Size: A3

Scale: 1:150,000

CRS: EPSG 25830

Rev.	Description	Date	By	Chk'd	App'd
A	First issue	2026/01/06	SG	KSo	MBo





- Planning Application Boundary (PAB)
- SLVIA study area (50 km buffer of the array site / wind farm site)
- 10 km incremental buffers of array site / wind farm site

Significance of Effect

- Significant (significant) / S (s)
- Moderate (not significant) / M (ns)
- Slight (not significant) / S (ns)
- Scoped out / SO

Note:

This Figure has been prepared to support ACP FIR. It does not present changes to the SLVIA assessment within the submitted EIAR and should be read in conjunction with Chapter 15 SLVIA Section 15.10.2 and Appendix 15.4 Seascape Character Assessment for the detailed assessment and associated narrative regarding the residual effects. It should be noted that whilst a residual effect may be significant in EIA terms, that does not necessarily mean that such an impact would be unacceptable or should necessarily be regarded as an "undue consequence." (EIAR Volume 3, Chapter 15, SLVIA paragraph 89).

All residual effects shown are predicted to arise from the operations and maintenance impact 1, would be worst case and based on the highest sensitive receptor. Residual effects would reduce where there is intervening vegetation / built form and / or landform as well as distance from the array site and atmospheric conditions.

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Project: Codling Wind Park

Contractor: LDĀDESIGN www.lda-design.co.uk

Figure 7: Summary of residual effects associated with Regional Seascape Character

CWP doc. number: CWP-LDA-ENG-08-01-MAP-2043

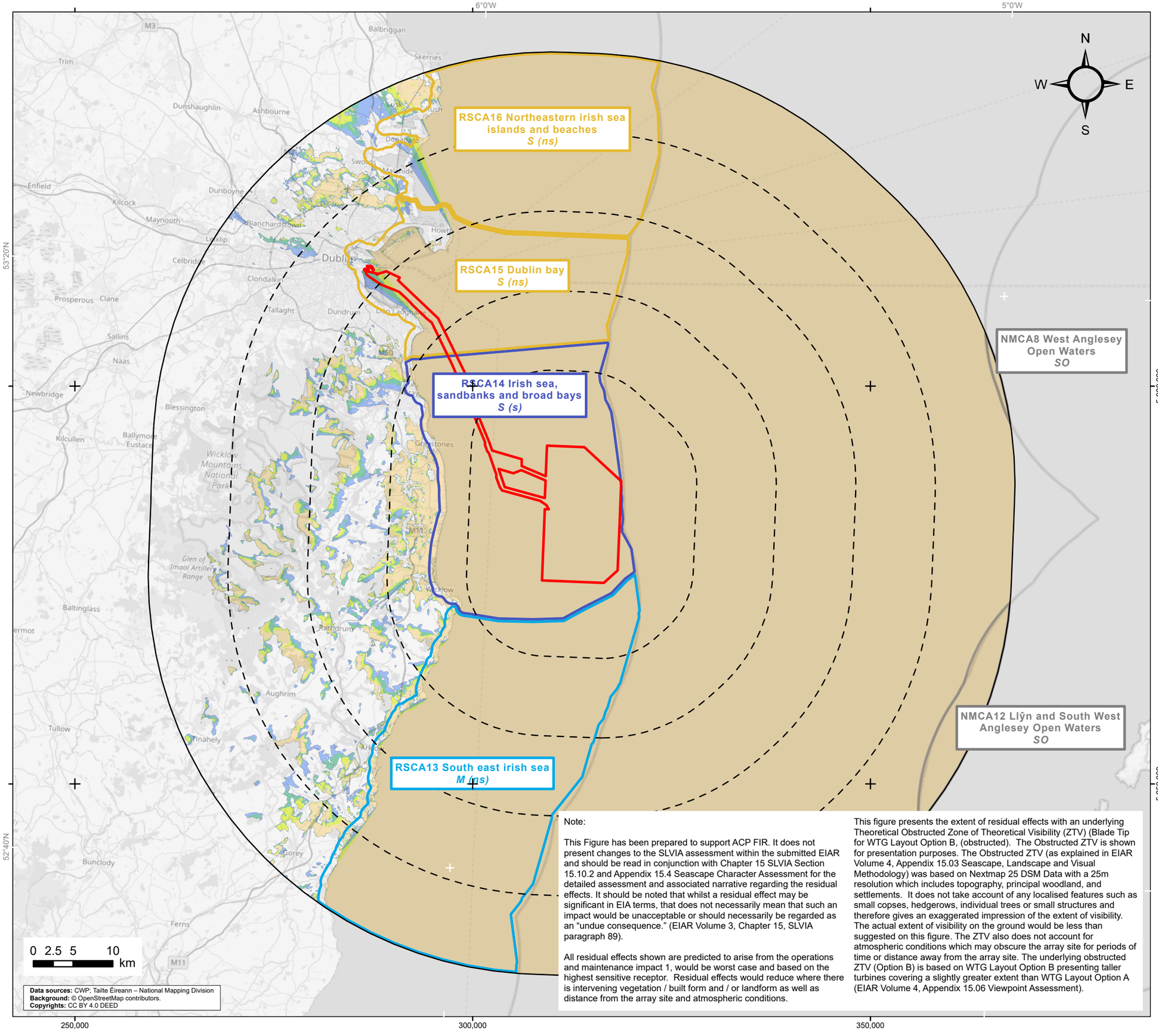
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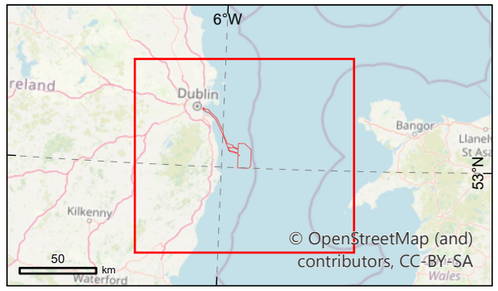
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CRS: EPSG 25830

Rev.	Description	Date	By	Chk'd	App'd
A	First issue	2026/01/06	SG	KSo	MBo





- Planning Application Boundary (PAB)
- SLVIA study area (50 km buffer of the array site / wind farm site)
- 10 km incremental buffers of array site / wind farm site

Significance of Effect

- Significant (significant) / S (s)
- Moderate (not significant) / M (ns)
- Slight (not significant) / S (ns)
- Scoped out / SO

Blade tip height Zone of Theoretical Visibility (ZTV) (obstructed)

Number of turbines theoretically visible to blade tip height:

- 1 - 15
- 15 - 30
- 30 - 45
- 45 - 60
- No theoretical visibility

Note:

This Figure has been prepared to support ACP FIR. It does not present changes to the SLVIA assessment within the submitted EIAR and should be read in conjunction with Chapter 15 SLVIA Section 15.10.2 and Appendix 15.4 Seascape Character Assessment for the detailed assessment and associated narrative regarding the residual effects. It should be noted that whilst a residual effect may be significant in EIA terms, that does not necessarily mean that such an impact would be unacceptable or should necessarily be regarded as an "undue consequence." (EIAR Volume 3, Chapter 15, SLVIA paragraph 89).

All residual effects shown are predicted to arise from the operations and maintenance impact 1, would be worst case and based on the highest sensitive receptor. Residual effects would reduce where there is intervening vegetation / built form and / or landform as well as distance from the array site and atmospheric conditions.

This figure presents the extent of residual effects with an underlying Theoretical Obstructed Zone of Theoretical Visibility (ZTV) (Blade Tip for WTG Layout Option B, (obstructed). The Obstructed ZTV is shown for presentation purposes. The Obstructed ZTV (as explained in EIAR Volume 4, Appendix 15.03 Seascape, Landscape and Visual Methodology) was based on Nextmap 25 DSM Data with a 25m resolution which includes topography, principal woodland, and settlements. It does not take account of any localised features such as small copses, hedgerows, individual trees or small structures and therefore gives an exaggerated impression of the extent of visibility. The actual extent of visibility on the ground would be less than suggested on this figure. The ZTV also does not account for atmospheric conditions which may obscure the array site for periods of time or distance away from the array site. The underlying obstructed ZTV (Option B) is based on WTG Layout Option B presenting taller turbines covering a slightly greater extent than WTG Layout Option A (EIAR Volume 4, Appendix 15.06 Viewpoint Assessment).

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Project: Codling Wind Park

Contractor: LDĀDESIGN www.lda-design.co.uk

Figure 7a: Summary of residual effects associated with Regional Seascape Character with Theoretical Obstructed ZTV (Blade Tip for Option B)

CWP doc. number: CWP-LDA-ENG-08-01-MAP-2044

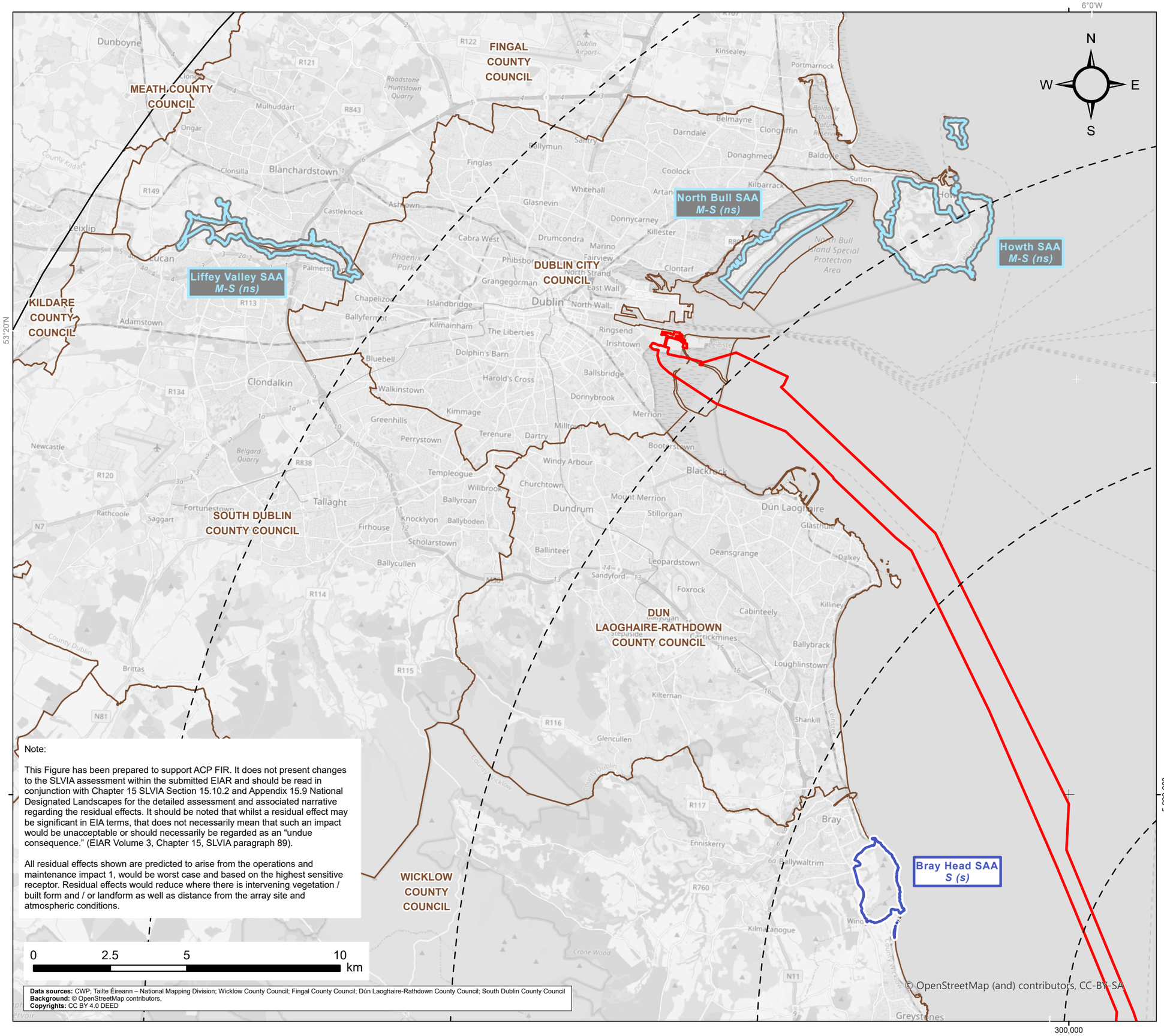
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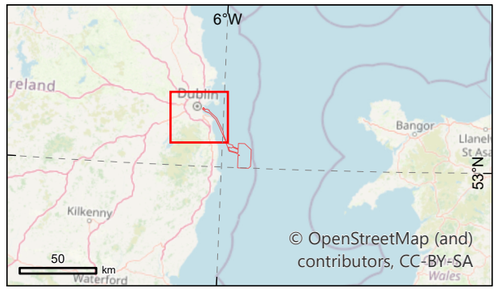
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CRS: EPSG 25830

Rev.	Description	Date	By	Chk'd	App'd
A	First issue	2026/01/06	SG	KSo	MBo





- Planning Application Boundary (PAB)
- SLVIA study area (50 km buffer of the array site / wind farm site)
- 10 km incremental buffers of array site / wind farm site
- County Council/City Council (named on plan)

Significance of Effect

- Significant (significant) / S (s)
- Moderate-Slight (not significant) / M-S (ns)

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Figure 8: Summary of residual effects associated with Landscape Designations (Special Amenity Area) - Landscape

CWP doc. number: CWP-LDA-ENG-08-01-MAP-2045

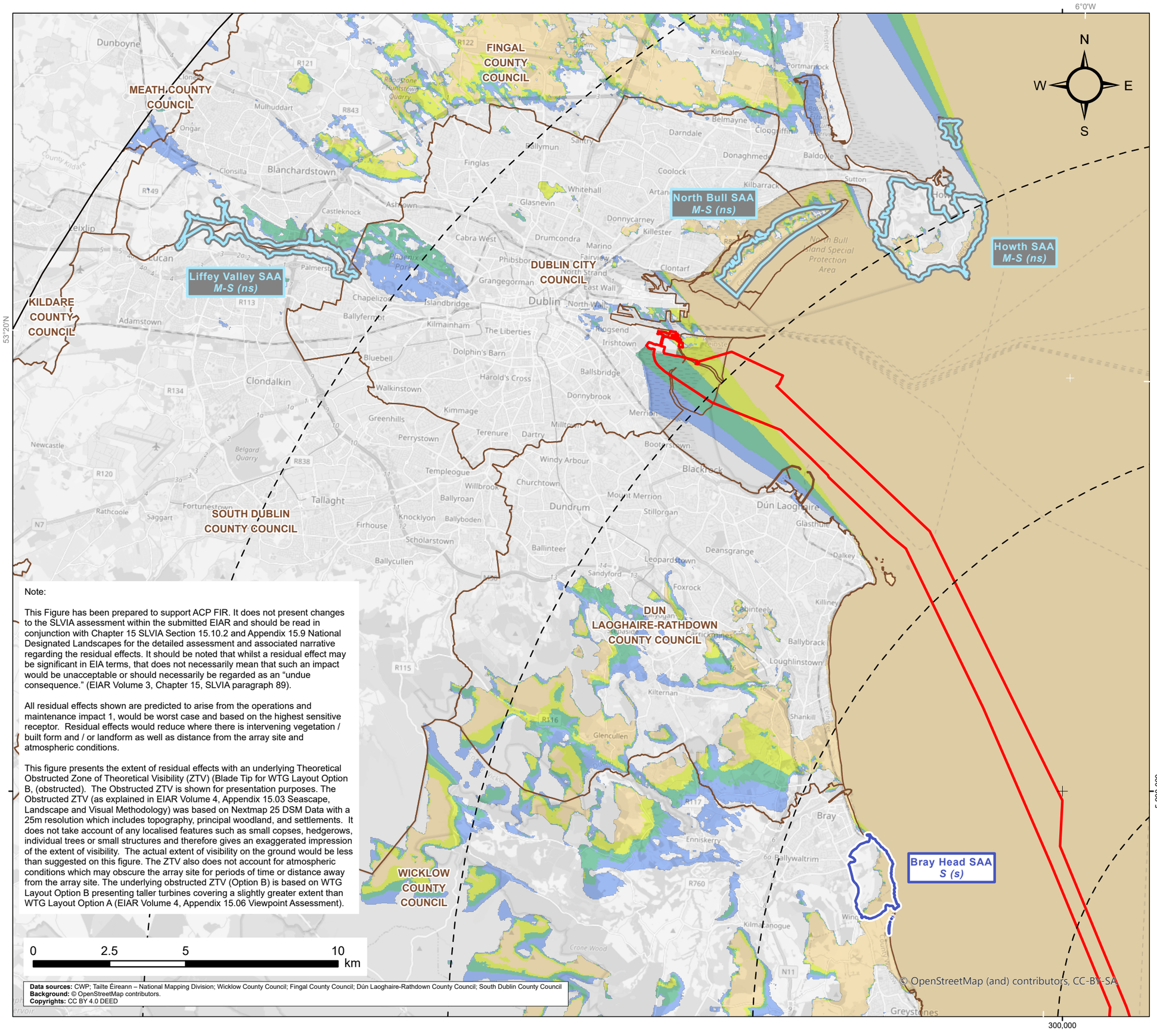
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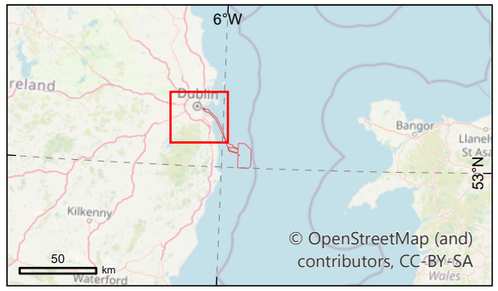
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Scale: 1:120,000

CRS: EPSG 25830

Rev.	Description	Date	By	Chk'd	App'd
A	First issue	2026/01/06	SG	KSo	MBo





Note:

This Figure has been prepared to support ACP FIR. It does not present changes to the SLVIA assessment within the submitted EIAR and should be read in conjunction with Chapter 15 SLVIA Section 15.10.2 and Appendix 15.9 National Designated Landscapes for the detailed assessment and associated narrative regarding the residual effects. It should be noted that whilst a residual effect may be significant in EIA terms, that does not necessarily mean that such an impact would be unacceptable or should necessarily be regarded as an "undue consequence." (EIAR Volume 3, Chapter 15, SLVIA paragraph 89).

All residual effects shown are predicted to arise from the operations and maintenance impact 1, would be worst case and based on the highest sensitive receptor. Residual effects would reduce where there is intervening vegetation / built form and / or landform as well as distance from the array site and atmospheric conditions.

This figure presents the extent of residual effects with an underlying Theoretical Obstructed Zone of Theoretical Visibility (ZTV) (Blade Tip for WTG Layout Option B, (obstructed). The Obstructed ZTV is shown for presentation purposes. The Obstructed ZTV (as explained in EIAR Volume 4, Appendix 15.03 Seascape, Landscape and Visual Methodology) was based on Nextmap 25 DSM Data with a 25m resolution which includes topography, principal woodland, and settlements. It does not take account of any localised features such as small copses, hedgerows, individual trees or small structures and therefore gives an exaggerated impression of the extent of visibility. The actual extent of visibility on the ground would be less than suggested on this figure. The ZTV also does not account for atmospheric conditions which may obscure the array site for periods of time or distance away from the array site. The underlying obstructed ZTV (Option B) is based on WTG Layout Option B presenting taller turbines covering a slightly greater extent than WTG Layout Option A (EIAR Volume 4, Appendix 15.06 Viewpoint Assessment).

- Planning Application Boundary (PAB)
- SLVIA study area (50 km buffer of the array site / wind farm site)
- 10 km incremental buffers of array site / wind farm site
- County Council/City Council (named on plan)

Significance of Effect

- Significant (significant) / S (s)
- Moderate-Slight (not significant) / M-S (ns)

Blade tip height Zone of Theoretical Visibility (ZTV) (obstructed)

Number of turbines theoretically visible to blade tip height:

- 1 - 15
- 15 - 30
- 30 - 45
- 45 - 60
- No theoretical visibility

Data sources: CWP; Tailte Éireann – National Mapping Division; Wicklow County Council; Fingal County Council; Dún Laoghaire-Rathdown County Council; South Dublin County Council
Background: © OpenStreetMap contributors.
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Project: Codling Wind Park

Contractor: LDĀDESIGN www.lda-design.co.uk

Figure 8a: Summary of residual effects associated with Landscape Designations (Special Amenity Area) - Landscape with Theoretical Obstructed ZTV (Blade Tip for Option B)

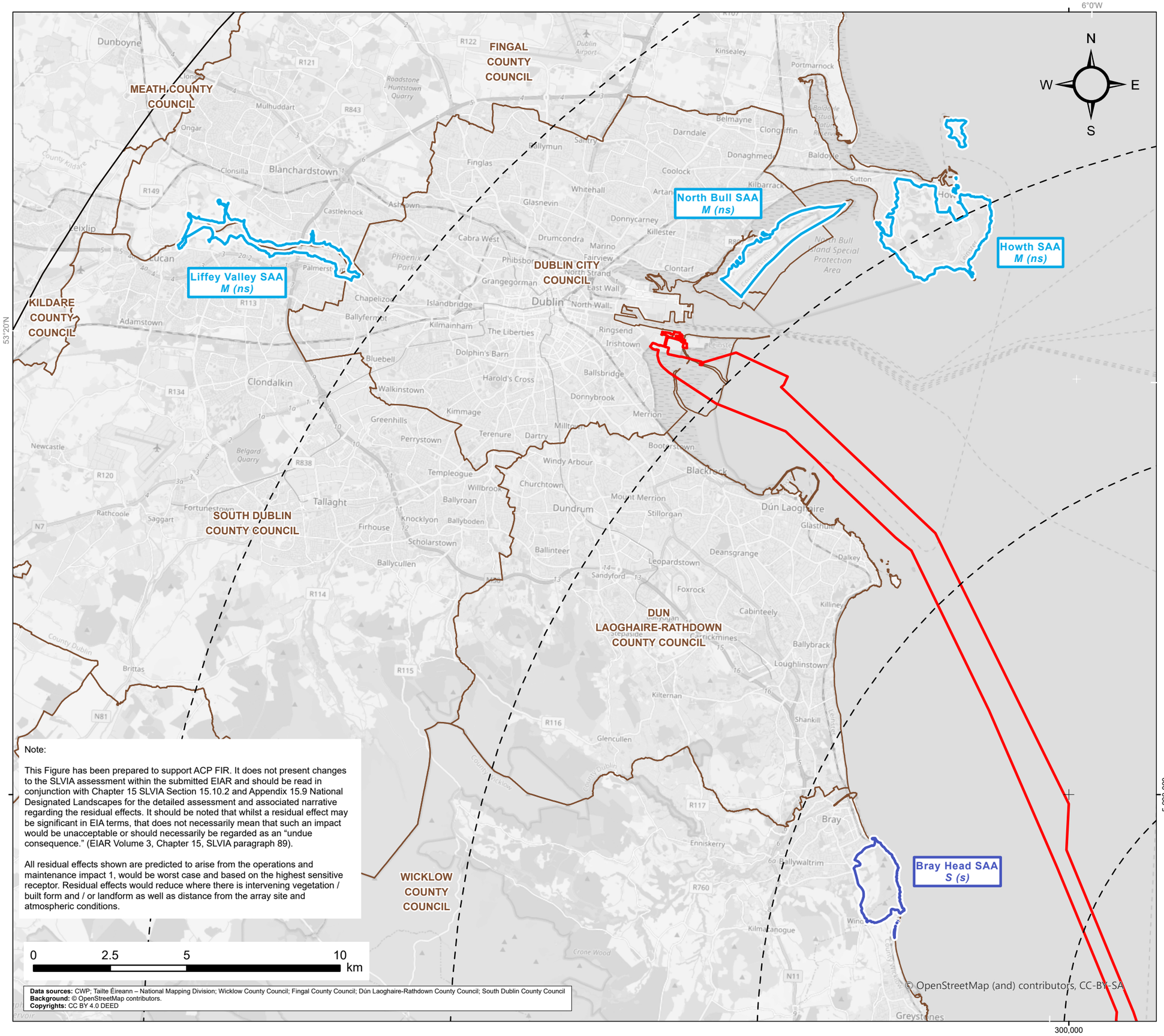
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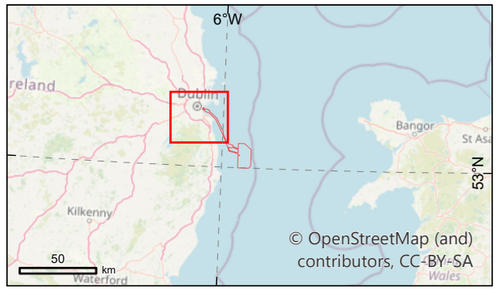
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Rev.	Description	Date	By	Chk'd	App'd
A	First issue	2026/01/06	SG	KSo	MBo





Planning Application Boundary (PAB)

SLVIA study area (50 km buffer of the array site / wind farm site)

10 km incremental buffers of array site / wind farm site

County Council/City Council (named on plan)

Significance of Effect

Significant (significant) / S (s)

Moderate (not significant) / M (ns)

Note:

This Figure has been prepared to support ACP FIR. It does not present changes to the SLVIA assessment within the submitted EIAR and should be read in conjunction with Chapter 15 SLVIA Section 15.10.2 and Appendix 15.9 National Designated Landscapes for the detailed assessment and associated narrative regarding the residual effects. It should be noted that whilst a residual effect may be significant in EIA terms, that does not necessarily mean that such an impact would be unacceptable or should necessarily be regarded as an "undue consequence." (EIAR Volume 3, Chapter 15, SLVIA paragraph 89).

All residual effects shown are predicted to arise from the operations and maintenance impact 1, would be worst case and based on the highest sensitive receptor. Residual effects would reduce where there is intervening vegetation / built form and / or landform as well as distance from the array site and atmospheric conditions.

Data sources: CWP; Tailte Éireann – National Mapping Division; Wicklow County Council; Fingal County Council; Dún Laoghaire-Rathdown County Council; South Dublin County Council
Background: © OpenStreetMap contributors.
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Project: Codling Wind Park

Contractor: LDĀDESIGN www.lda-design.co.uk

Figure 9: Summary of residual effects associated with Landscape Designations (Special Amenity Area) – Visual

CWP doc. number: CWP-LDA-ENG-08-01-MAP-2047

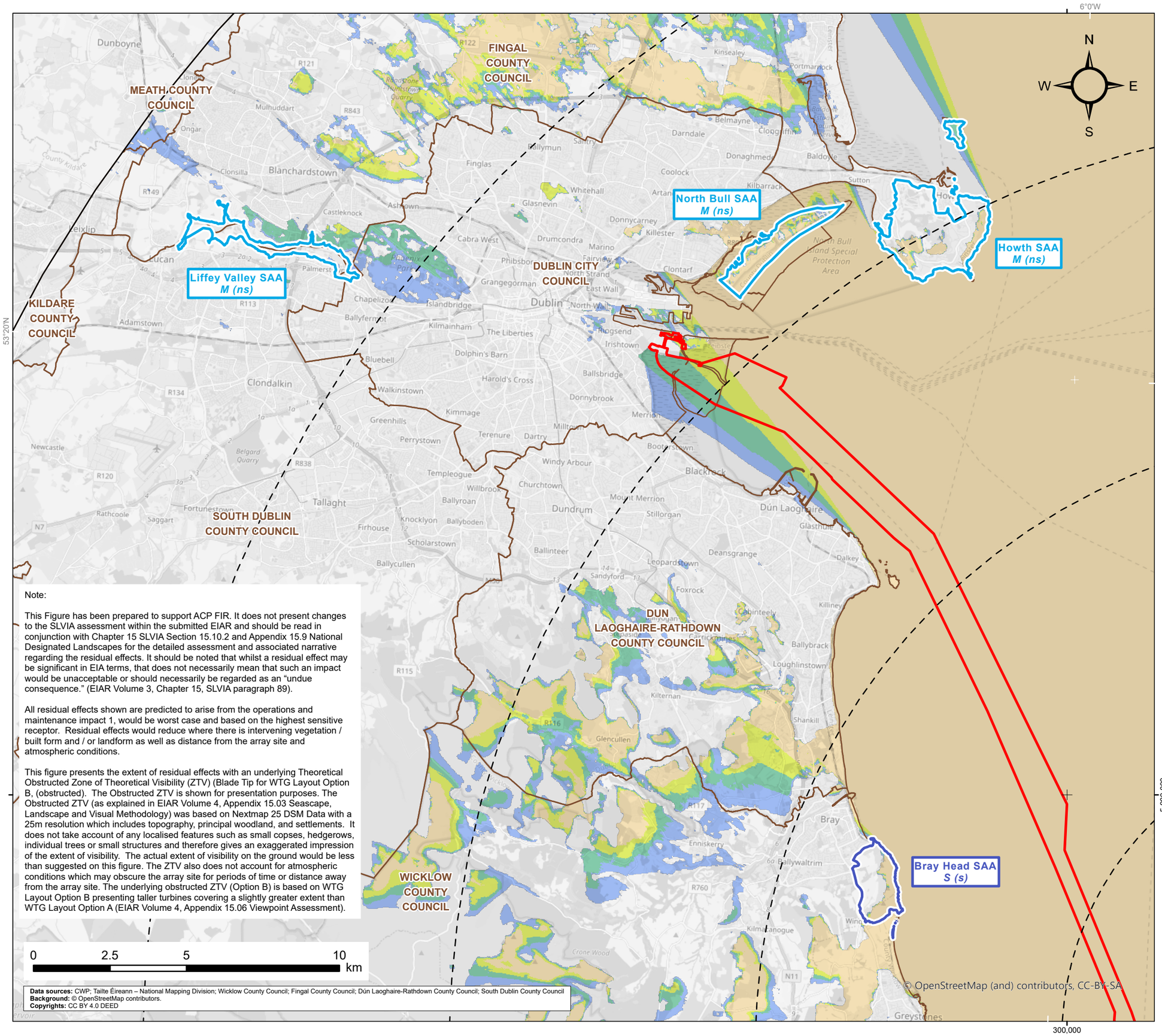
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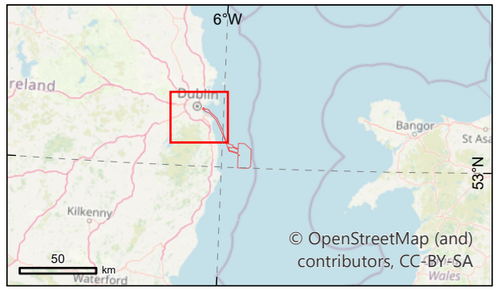
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Rev.	Description	Date	By	Chk'd	App'd
A	First issue	2026/01/06	SG	KSo	MBo





Note:

This Figure has been prepared to support ACP FIR. It does not present changes to the SLVIA assessment within the submitted EIAR and should be read in conjunction with Chapter 15 SLVIA Section 15.10.2 and Appendix 15.9 National Designated Landscapes for the detailed assessment and associated narrative regarding the residual effects. It should be noted that whilst a residual effect may be significant in EIA terms, that does not necessarily mean that such an impact would be unacceptable or should necessarily be regarded as an "undue consequence." (EIAR Volume 3, Chapter 15, SLVIA paragraph 89).

All residual effects shown are predicted to arise from the operations and maintenance impact 1, would be worst case and based on the highest sensitive receptor. Residual effects would reduce where there is intervening vegetation / built form and / or landform as well as distance from the array site and atmospheric conditions.

This figure presents the extent of residual effects with an underlying Theoretical Obstructed Zone of Theoretical Visibility (ZTV) (Blade Tip for WTG Layout Option B, (obstructed). The Obstructed ZTV is shown for presentation purposes. The Obstructed ZTV (as explained in EIAR Volume 4, Appendix 15.03 Seascape, Landscape and Visual Methodology) was based on Nextmap 25 DSM Data with a 25m resolution which includes topography, principal woodland, and settlements. It does not take account of any localised features such as small copses, hedgerows, individual trees or small structures and therefore gives an exaggerated impression of the extent of visibility. The actual extent of visibility on the ground would be less than suggested on this figure. The ZTV also does not account for atmospheric conditions which may obscure the array site for periods of time or distance away from the array site. The underlying obstructed ZTV (Option B) is based on WTG Layout Option B presenting taller turbines covering a slightly greater extent than WTG Layout Option A (EIAR Volume 4, Appendix 15.06 Viewpoint Assessment).

- Planning Application Boundary (PAB)
- SLVIA study area (50 km buffer of the array site / wind farm site)
- 10 km incremental buffers of array site / wind farm site
- County Council/City Council (named on plan)

Significance of Effect

- Significant (significant) / S (s)
- Moderate (not significant) / M (ns)

Blade tip height Zone of Theoretical Visibility (ZTV) (obstructed)

Number of turbines theoretically visible to blade tip height:

- 1 - 15
- 15 - 30
- 30 - 45
- 45 - 60
- No theoretical visibility

Data sources: CWP; Tailte Éireann – National Mapping Division; Wicklow County Council; Fingal County Council; Dún Laoghaire-Rathdown County Council; South Dublin County Council
Background: © OpenStreetMap contributors.
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Project: Codling Wind Park

Contractor: LDĀDESIGN www.lda-design.co.uk

Figure 9a: Summary of residual effects associated with Landscape Designations (Special Amenity Area) – Visual with Theoretical Obstructed ZTV (Blade Tip for Option B)

CWP doc. number: CWP-LDA-ENG-08-01-MAP-2048

Internal descriptive code:

Size: A3
Scale: 1:120,000

CRS: EPSG 25830

Rev.	Description	Date	By	Chk'd	App'd
A	First issue	2026/01/06	SG	KSo	MBo

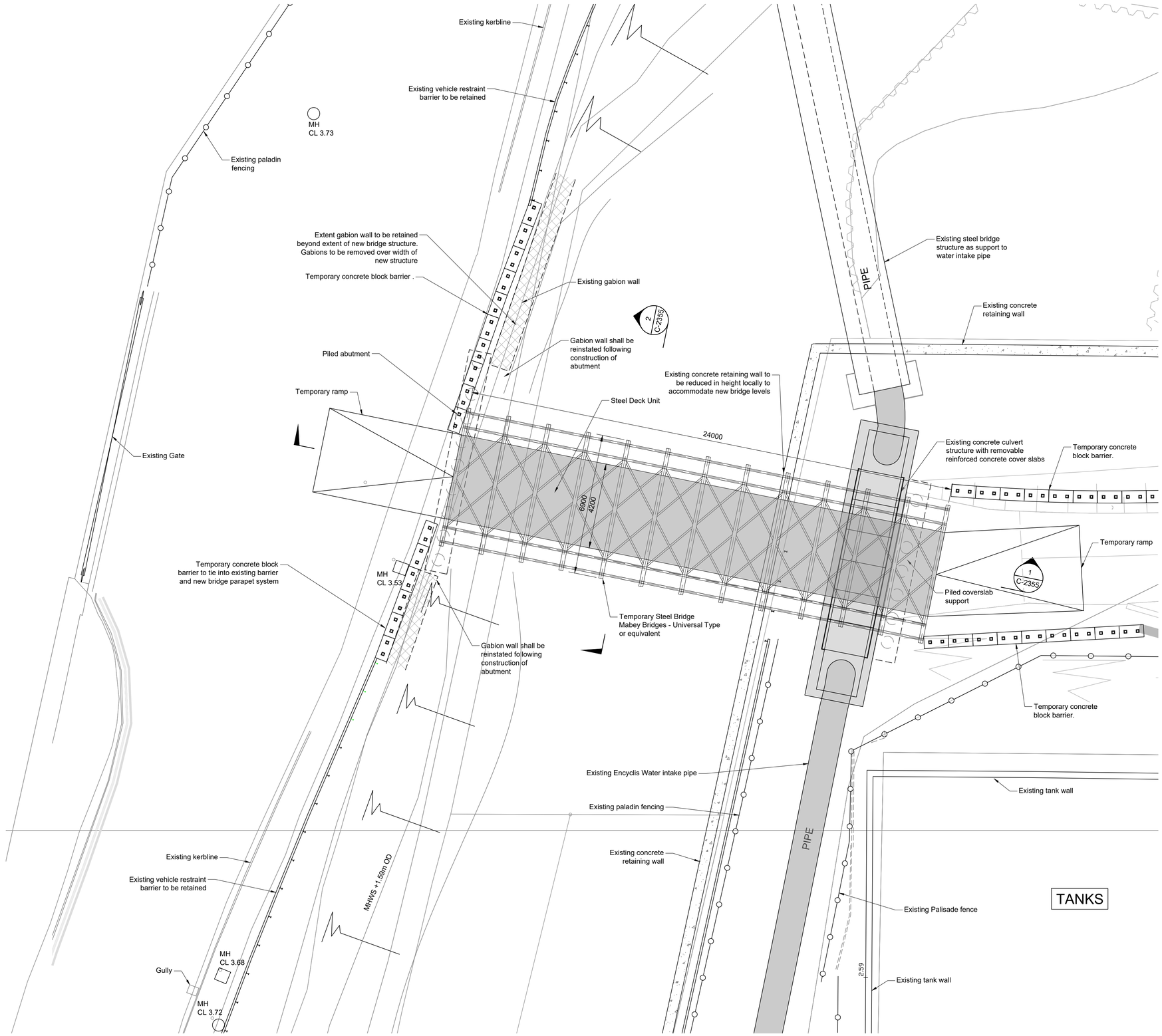


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FIR

FIR Response Document

Appendix P - Temporary bailey bridge drawings



Plan
Scale 1:100

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OS Mapping Reference:
OS3265-06, OS3265-11
OS3264-10, OS3264-15

Notes

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3. All dimensions are in millimetres.
4. All levels are in metres above Ordnance Datum Malin (ODM).
5. All proposed elements to have Category 1 design working life as per Table 2.1 of IS EN 1990.
6. The piles and abutment shall be designed to accommodate the full permanent bridge loadings associated with the final bridge structure.

Key Plan



Key to Symbols

Safety, Health and Environmental Information

References

CWP-E12-MMD-ONS-DR-C-2355-01- Onshore Substation Site - Temporary Western Bridge - Elevation and Sections

Rev	Date	Description	Drawn	Ch'k'd	App'd
P1	28/01/2026	For Information	RS	SKI	DM

MOTT MACDONALD
South Block
Rockfield
Dundrum
Dublin 16
Ireland
T +353 (0)1 291 6700
F
W www.mottmac.com

Client

CODLING WIND PARK

Title

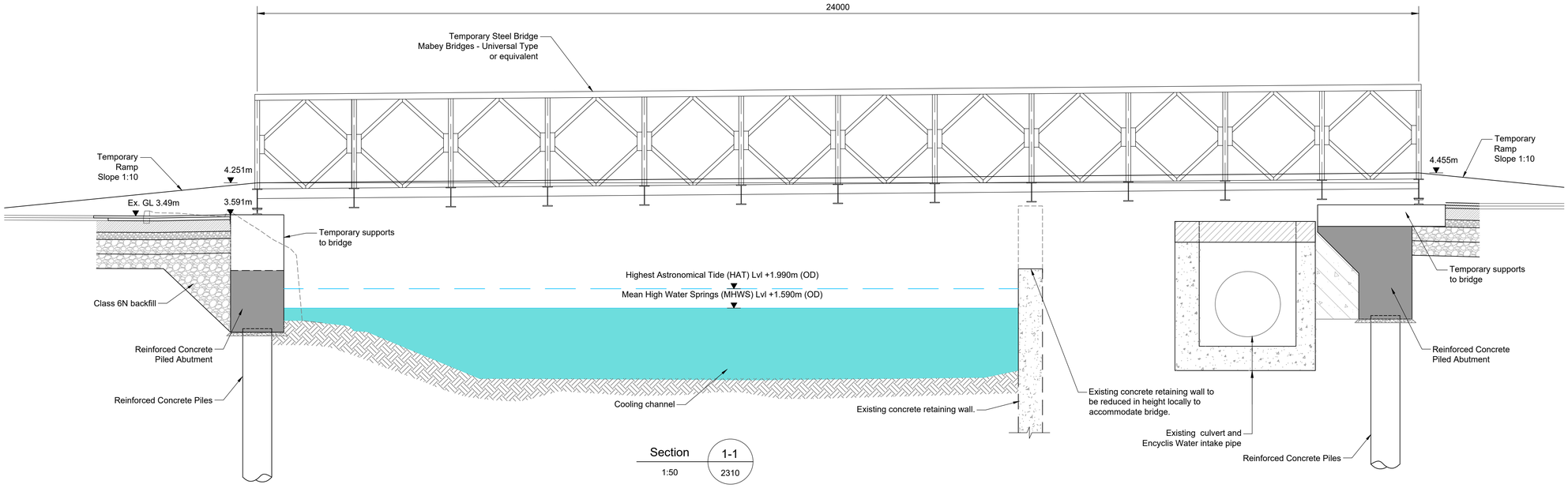
Onshore Substation Site
Temporary Western Bridge

Plan

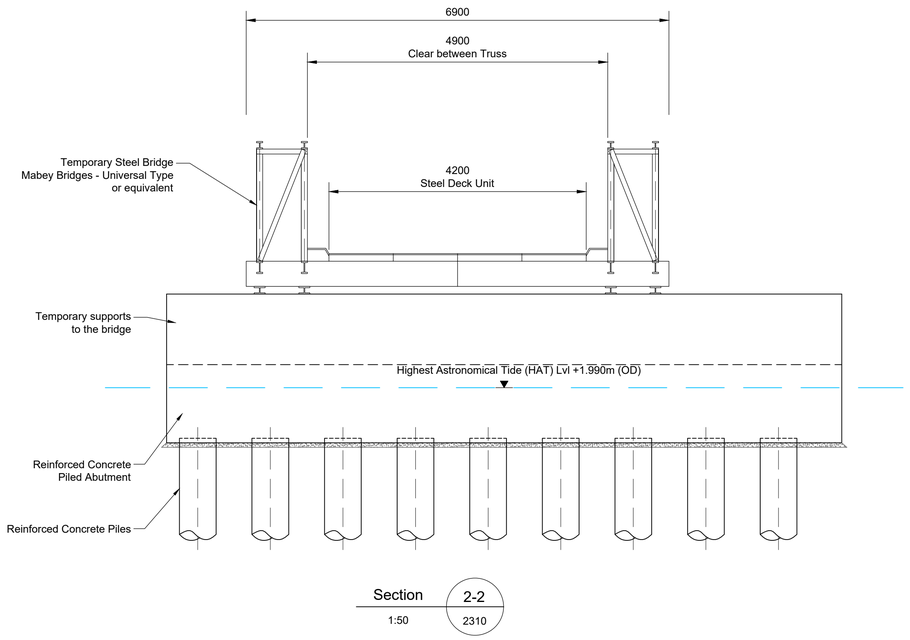
CWP Drawing Number
CWP-E12-MMD-ONS-DR-C-2310-01

Scale at A1	MM Status	MM Rev	MM Security
1:100	PRE	P1	STD

MM Drawing Number
229101147-MMD-01-XX-DR-C-2310



Section 1-1 (2310)
1:50



Section 2-2 (2310)
1:50

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1:50 0 2.5m 5m

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2. For Planning purposes only. Not for construction.
3. All dimensions are in millimetres.
4. All levels are in metres above Ordnance Datum Malin (ODM).
5. All proposed elements to have Category 1 design working life as per Table 2.1 of IS EN 1990.
6. The piles and abutment shall be designed to accommodate the full permanent bridge loadings associated with the final bridge structure.

Key Plan

Key to Symbols

Safety, Health and Environmental Information

References

CWP-E12-MMD-ONS-DR-C-2310-01-Onshore Substation Site - Temporary Western Bridge - Plan

Rev	Date	Description	Drawn	Ch'k'd	App'd
P1	28/01/2026	Issued for Client Review	RS	SKI	DM

MOTT MACDONALD
South Block
Rockfield
Dundrum
Dublin 16
Ireland
T +353 (0)1 291 6700
F
W www.mottmac.com

Client

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Title

Onshore Substation Site
Temporary Western Bridge

Elevations & Sections

CWP Drawing Number
CWP-E12-MMD-ONS-DR-C-2355-01

Scale at A1	MM Status	MM Rev	MM Security
Shown	PRE	P1	STD

MM Drawing Number
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