



codling
wind park



Cumulative Effects Assessment (CEA) Report

Part 2

Offshore Topics (Chapters 6 to
18 of the EIAR)



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Abbreviations

Abbreviation	Term in Full
CEA	Cumulative Effects Assessment
CEMP	Construction Environmental Management Plan
CWP	Codling Wind Park
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EMF	Electromagnetic Field
EVMP	Ecological Vessel Management Plan
DPC	Dublin Port Company
FHC	Fisheries Harbour Centre
FIR	Further Information Request
FMMMS	Fisheries Management Mitigation Plan
GDG	Greater Dublin Drainage
IFI	Inland Fisheries Ireland
IPPEMP	In Principle Project Monitoring Plan
IRCG	Irish Coastguard
LMP	Lighting & Marking Plan
MLWS	Mean Low Water Springs
MMO	Marine Management Organisation
NPS	National Policy Statement
NSP	Navigational Safety Plan
NSIP	Nationally Significant Infrastructure Project
NSL	Noise Sensitive Location
OECE	Offshore Export Cable Corridor
OEMP	Operational Environment Management Plan
OTI	Onshore Transmission Works
OWF	Offshore wind farm
O&M	Operations and maintenance
PINS	Planning Inspectorate
PTS	Permanent Threshold Shift

Abbreviation	Term in Full
SAR	Search and Rescue
SSC	Suspended Sediment Concentration
TII	Transport Infrastructure Ireland
TJB	Transition joint bay
TMO	Traffic Management Officer
TRSA	Tourism Recreational Study Area
TTS	Temporary Threshold Shift
TTA	Traffic Transport Assessment
UXO	Unexploded Ordnance
VMP	Vessel Management Plan
WEI	Wind Energy Ireland
WTG	Wind turbine generator
WWTP	Waste Water Treatment Plant

INTRODUCTION

1. This document forms **Part 2** of the **Cumulative Effects Assessment (CEA) Report**. The document responds to Item 5 of the Commission's FIR by providing a revised, standalone CEA for the CWP Project. The purpose of the **CEA Report** is to present the applied CEA methodology for the CWP Project EIA (**CEA Report (Part 1)**) and the findings of the updated CEAs for each EIA topic (**CEA Report Part 2** and **Part 3**) whereby project alone effects are assessed alongside the effects of other existing, approved or planned development.
2. The **CEA Report** is structured as follows:
 - Part 1:
 - Section 1: Introduction to the CEA with details on relevant legislation and guidance
 - Section 2: CEA methodology and approach
 - Part 2 (**this document**) presents the CEAs for the following EIA topics:
 - Section 3 Marine Geology, Sediments and Coastal Processes
 - Section 4 Marine Water Quality
 - Section 5 Subtidal and Intertidal Ecology
 - Section 6 Fish, Shellfish and Turtle Ecology
 - Section 7 Ornithology (Offshore)
 - Section 8 Ornithology (Estuarine/Liffey and onshore)
 - Section 9 Marine Mammals
 - Section 10 Commercial Fisheries
 - Section 11 Offshore Bats
 - Section 12 Marine Archaeology and Cultural Heritage
 - Section 13 Seascape, Landscape and Visual Impact
 - Section 14 Shipping and Navigation
 - Section 15 Aviation, Military and Radar
 - Section 16 Material Assets – Marine Infrastructure
 - Part 3 presents the CEA assessments for the following topics:
 - Section 17 Land, Soils and Geology
 - Section 18 Hydrology and Hydrogeology
 - Section 19 Onshore Biodiversity
 - Section 20 Onshore Archaeological, Architectural and Cultural Heritage
 - Section 21 Landscape and Visual Impact Assessment (LVIA)
 - Section 22 Noise and Vibration
 - Section 23 Air Quality
 - Section 24 Material Assets Built Services
 - Section 25 Traffic and Transport
 - Section 26 Climate
 - Section 27 Population
 - Section 28 Human Health
 - Section 29 Waste and Resource Management
 - Section 30 Risk of Major Accidents and Disasters
3. The **CEA Report** presents cumulative assessments in accordance with the guidance on Nationally Significant Infrastructure Projects (NSIP): Advice on Cumulative Effects Assessment (Planning Inspectorate (PINS), 2024), hereafter referred to as the 'PINS CEA Guidance (2024)'.
4. Reference is made throughout this document to **Appendix 1** of **Part 1** of the **CEA Report** which presents Stages 1 and 2 of the CEA in line with PINS CEA Guidance (2024). This includes establishing the long list of other development (Stage 1) and long list screening (Stage 2) to establish a short list



of other development for each EIA topic. The shortlists are presented in each topic specific section of the CEA (**Part 2** and **Part 3** of the **CEA Report**).

3 MARINE GEOLOGY, SEDIMENTS AND COASTAL PROCESSES

3.1 Introduction

5. This section of the CEA Report presents the findings of the CEA for Marine Geology, Sediments and Coastal Processes, which considers the residual effects presented in **Volume 3, Chapter 6 Marine Geology, Sediments and Coastal Processes** alongside the potential effects of other proposed and reasonably foreseeable development. Cumulative effects are considered in this document across the construction and operation and maintenance phases of the CWP Project.
6. Updates to the project alone assessment for Marine Geology, Sediments and Coastal Processes as a consequence of ACPs FIR are presented in **Section 6** of the **EIAR Addendum**. This updated CEA incorporates relevant updates from the project alone assessment and has been updated in response to the requests made in item 5 of the FIR.

3.2 Consultation

7. Stakeholder feedback received during the consultation process that is relevant to the marine geology, sediments and coastal processes impact assessment is provided in **Volume 3, Chapter 6 Marine Geology, Sediments and Coastal Processes** of the EIAR.
8. No feedback specific to the CEA for marine geology, sediments and coastal processes was received during the pre-application consultation phase. Stakeholder feedback on the CEA in response to the CWP Project planning application has been responded to in the **FIR Response Document** and the **Observations Response Document**, including confirmation of any updates made in response to the feedback received.

3.3 CEA impact screening

9. The first step in the CEA for Marine Geology, Sediments and Coastal Processes is the identification of which residual impacts assessed for the CWP Project alone have the potential for a significant cumulative impact with other development (described as 'impact screening'). This screening exercise is set out in **Table 3-1** below.
10. Only potential impacts assessed in **Volume 3, Chapter 6 Marine Geology, Sediments and Coastal Processes** as Minor (Not Significant) or above are included in the CEA (i.e. those assessed as 'imperceptible' are not taken forward as there is no potential for them to contribute to a cumulative effect).

Table 3-1 Impacts and potential for cumulative effect

Impact	CWP Project alone residual effect	Potential for significant cumulative effect – screened into the CEA (Yes / No)
Construction		
Impact 1: Temporary disturbance of the seabed resulting from pre-installation methods and effects, cable and monopile installation leading to	Not Significant	Yes

Impact	CWP Project alone residual effect	Potential for significant cumulative effect – screened into the CEA (Yes / No)
increases in suspended sediment concentrations and associated deposition.		
Impact 2: Temporary disturbance of the seabed resulting from pre-sweeping / sandwave levelling activities leading to increases in suspended sediment concentrations and associated deposition.	Not Significant	Yes
Impact 3: Alteration to seabed and intertidal morphology during seabed preparation and cable installation activities.	Not Significant	Yes
Impact 4: Localised alteration to the hydrodynamic, wave and sediment regimes and coastal processes.	Not Significant	Yes
Operation		
Impact 1: Localised alteration of hydrodynamic and wave conditions across the site and effects on the sediment transport regime and coastal processes.	Not Significant	Yes
Impact 2: Scour around installed structures and associated sediment transportation and deposition leading to changes in seabed composition, structure or morphology.	Not Significant	Yes
Impact 3: Operation and maintenance	Not Significant	Yes
Decommissioning		
Impact 1: Temporary increases in suspended sediment concentration during removal of foundations and / or cables.	The detail and scope of the decommissioning works for the CWP Project will be determined by the relevant legislation and guidance at the time of decommissioning. Project alone impacts during the decommissioning phase of the CWP Project are assessed in Chapter 6 Marine Geology, Sediments and Coastal Processes. It is anticipated that the impacts will be no greater than those identified for the construction phase, and therefore no separate assessment of cumulative impacts during the decommissioning phase is presented within this CEA.	
Impact 2: Localised alteration of hydrodynamic and wave conditions across the site and effects on the sediment transport regime and coastal processes.		

3.4 Stage 3: Information gathering and ‘other development’ screening

11. Stage 2 of the CEA is presented in **Appendix 1** of **Part 1** of the **CEA Report**. This exercise established a shortlist of other development for Marine Geology, Sediments and Coastal Processes using set screening criteria.
12. The shortlist of other development screened into the CEA for Marine Geology, Sediments and Coastal Processes at Stage 2 are listed below.
 - SSE Renewables - Arklow Bank Wind Park 2 (OWF_01);
 - RWE - Dublin Array (OWF_02);
 - Dublin Port Company - Maintenance Dredging in Dublin Port (CA_40 / DAS_04);
 - Dublin Port Company - Dredging and Dumping at Sea arising from the Dublin Harbour Capital Dredging Project (DAS_19);
 - DLRCC (formerly Dún Laoghaire Harbour Company) - Mooring Maintenance (CA_19);
 - Dublin Port Company - Dumping at Sea arising from capital dredging works under the MP2 Project (DAS_03);
 - Dublin Port Company - MP2 Project (CA_16);
 - Dublin Port Company – 3FM Project (CA_33);
 - Microsoft - SOBR1 subsea fibre optic cable (SC_03);
 - MaresConnect Limited - MaresConnect Interconnector (SC_11);
 - Minister for Agriculture, Food and the Marine - Development at Howth Fishery Harbour Centre (dredging and reclamation works) (CA_11); and
 - Irish Water - Greater Dublin Drainage Project (CA_45).
13. Information gathering (Stage 3 of the CEA) has enabled a further review of the other development shortlist for Marine Geology, Sediments and Coastal Processes, including a more detailed consideration of the location, nature and scale of the development, the timing of construction and operation activities, the information available to inform a CEA and the likelihood of a significant effect.
14. This information has been used to screen the Stage 2 shortlist to establish a final list of other development for detailed assessment at Stage 4 of the CEA. The results of the exercise are presented in **Table 3-2** below.
15. The location of these other developments, which have been screened-in, relative to the CWP Project is shown on a map of the area in **Figure 1**.

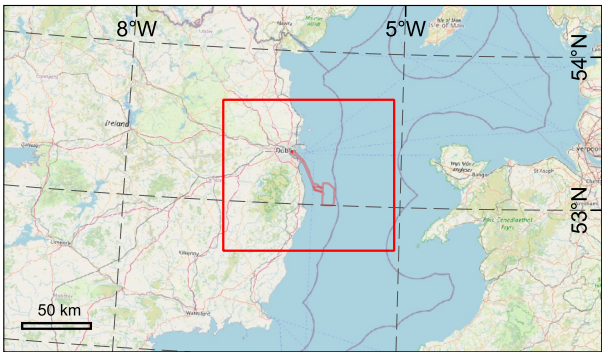
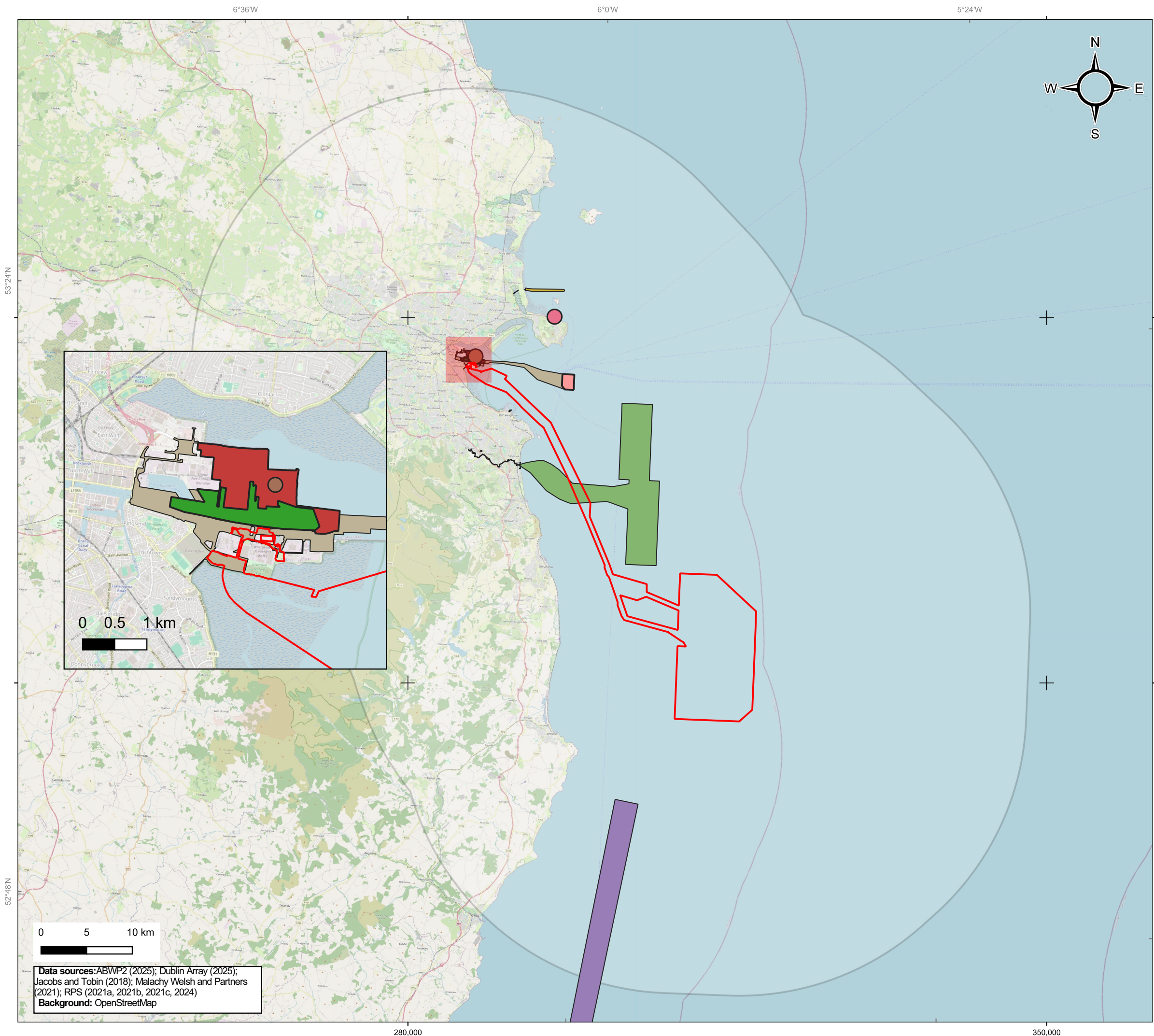
Table 3-2 Summary of other development screened into the CEA for Marine Geology, Sediments and Coastal Processes

Development	Distance from the array site (km)	Distance from the export cable corridor	Tier	Included in the CEA (Yes/No)	Rationale
Ref: OWF_01 Project: Arklow Bank Wind Park 2 Developer: SSE Renewables Planning Ref: OA27.319864	9.3	17.6	1	Yes	Screened into the CEA.
Ref: OWF_02 Project: Dublin Array Developer: RWE Planning Ref: OA06D.321992	2.8	0	1	Yes	Screened into the CEA.
Ref: CA_40 / DAS_04 Project: Maintenance Dredging in Dublin Port Developer: Dublin Port Company Planning Ref: FS007132 and S0004-03	32.2	0.8	1	Yes	Screened into the CEA.
Ref: DAS_19 Project: Dredging and Dumping at Sea	23.2	3.7	1	Yes	Screened into the CEA.

Development	Distance from the array site (km)	Distance from the export cable corridor	Tier	Included in the CEA (Yes/No)	Rationale
arising from the Dublin Harbour Capital Dredging Project Developer: Dublin Port Company Planning Ref: S0033-01 and FS007164					
Ref: CA_19 Project: Mooring Maintenance Developer: DLRCC (formerly Dún Laoghaire Harbour Company) Planning Ref: FS006713	25.6	0	1	No	No construction works associated with the development are anticipated to impact on the Physical and Coastal Processes environment (Department of Housing, Local Government and Heritage, 2017): Screened out of the assessment.
Ref: DAS_03 Project: Dumping at Sea arising from capital dredging works under the MP2 Project Developer: Dublin Port Company	23.2	3.7	1	Yes	Screened into the CEA.

Development	Distance from the array site (km)	Distance from the export cable corridor	Tier	Included in the CEA (Yes/No)	Rationale
Planning Ref: S0024-02					
Ref: CA_16 Project: MP2 Project Developer: Dublin Port Company Planning Ref: PA29N.304888	25.1	4.2	1	Yes	Screened into the CEA.
Ref: CA_33 Project: 3FM Project Developer: Dublin Port Company Planning Ref: PA29N.320250	31.3	0.6	1	Yes	Screened into the CEA.
Ref: SC_03 Project: SOBR1 subsea fibre optic cable Developer: Microsoft Planning Ref: N/A	27	1.1	3	No	Inadequate information is available for appropriate screening into the CEA: Screened out of the assessment.
Ref: SC_11 Project: MaresConnect Interconnector Developer: MaresConnect	43.2	19.6	3	No	Inadequate information is available for appropriate screening into the CEA: Screened out of the assessment.

Development	Distance from the array site (km)	Distance from the export cable corridor	Tier	Included in the CEA (Yes/No)	Rationale
Limited Planning Ref: N/A					Screened out of the assessment
Ref: CA_11 Project: Development at Howth Fishery Harbour Centre (dredging and reclamation works) Developer: Minister for Agriculture, Food and the Marine Planning Ref: PL06F.314487	22.4	8	1	Yes	Screened into the CEA.
Ref: CA_45 Project: Greater Dublin Drainage Project Developer: Irish Water Planning Ref: FS006843	33.1	9.9	1	Yes	Screened into the CEA.



Legend

- Planning application boundary
- Buffer considered for the purpose of the CEA (30 km)
- The offshore dredge disposal site used by the Dublin Port Company for the disposal works associated with the MP2 development, maintenance dredging, capital dredging project and 3FM project
- MP2 planning boundary
- Dublin port capital dredging project boundaries
- 3FM Planning Boundary
- Greater Dublin Drain Outfall
- Dublin port company
- Howth FHC
- Offshore wind farms**
- Arklow Bank Phase 2
- Dublin Array

		Project: Codling Wind Park		Contractor: Partrac.com 	
Figure 1: Other developments screened in the CEA for the marine geology, sediments and coastal processes assessment.					
CWP doc. number: CWP-PAR-ENG-08-01-MAP-0671					
Internal descriptive code: CWP-NP-02-CEA0001-REV01			Size: A3 Scale: 1:400,000	CRS: EPSG 25830	
Rev.	Updates		Date	By	Chk'd App'd
Rev01	Second issue		2026/03/06	AS	MW MW

3.5 Stage 4: Assessment of cumulative effects

3.5.1 Construction phase

Cumulative Impact 1: Temporary disturbance of the seabed resulting from pre-installation methods and effects, cable and monopile installation leading to increases in suspended sediment concentrations and associated deposition

16. As described in **Chapter 6 Marine Geology, Sediments and Coastal Processes Section 6.10**, a Minor impact resulting from an increase in suspended sediment concentration (SSC) levels is anticipated for all marine geology, sediments and coastal processes receptors during the construction phase when the CWP Project is considered separately.
17. The Dublin Harbour Capital Dredging Project at Dublin Port is being proposed for consent as part of the Dublin Port Masterplan 2018 (Department of Housing, Local Government and Heritage, 2022). In total, 500,000 m³ of material is to be dredged during an eight-year dredging programme. The sediments to be dredged are mixed, comprising clays, silts, sands and gravels with occasional cobbles. The proposed areas to be dredged are all within the inner Dublin Port Harbour and the dumping is planned for the offshore dump site presented in **Figure 1**, under EPA Dumping at Sea Permit S0004-03 (2022–2029). As part of the EIAR submitted in support of the foreshore licence and dumping at sea permit (RPS, 2021a), an assessment of impacts on coastal processes receptors was completed. Dublin Port Company (DPC) carries out routine maintenance dredging of the navigation channel, basins and berthing pockets in order to maintain accepted charted depths and provide safe navigation for vessels to and from the Port. The dredged material mostly consists of silt and sand, with elements of clay. The campaigns utilise a trailer suction dredger to dredge a maximum of 300,000 m³ per annum. The dredge arisings are disposed of within the bounds of an existing licenced offshore disposal site (shown in **Figure 1**). To assess the potential impacts of the dredge and disposal activities on coastal processes, a Coastal Processes Risk Assessment was completed as part of the planning application (RPS, 2021b). The modelling exercises, performed to assess the impacts of the capital dredging works and the maintenance dredging works, concluded that the dredging operations will not result in any significant impact to water quality in terms of suspended sediments, and elevated suspended sediment concentrations arising from the disposal works will not extend beyond 750 m of the dumping site (RPS, 2021a, 2021b).
18. A similar modelling exercise was performed for the MP2 Project at Dublin Port, which was consented for development in accordance with the Dublin Port Master Plan 2018 (Department of Housing, Local Government and Heritage, 2022). The exercise concluded that dredging and disposal activities will not result in any significant increases to the background level of suspended sediments and will not impact on the existing water quality in the greater Dublin Bay area (RPS, 2021c), with only localised effects anticipated (circa <1 km from dredge / disposal activities).
19. The Dublin Port 3FM development comprises quay works, terminal reconfiguration, and associated marine activities within the inner harbour. Any dredging required for berth deepening or quay wall construction will involve removal of mixed sands, silts, and clays from confined harbour areas. As part of the EIAR submitted, the potential impact of the 3FM Project on the coastal processes within the Dublin Port and Dublin Bay areas were assessed (RPS, 2024). The EIAR confirms that dredged material will be transported to Dublin Port's existing licensed offshore disposal site, located west of Burford Bank (see **Figure 1**). Numerical modelling undertaken as part of the EIAR shows disposal plumes at this site remain highly localised, with the majority of sediment settling within several hundred metres (< 750 m North / South) of the release location, and finer fractions dispersing rapidly under

semi-diurnal tidal currents. Dredging activities conducted within the Port Area are anticipated to be confined within the Navigation Channels; suspended sediment plumes did not extend beyond the corner of Capital Dock.

20. Greater Dublin Drainage (GDD) project, which in the marine offshore environment comprises of a marine outfall pipeline and diffuser. The GDD marine section comprises circa 5.2 km of outfall from the townland of Burrow, into the Irish Sea, circa 1 km north-east of Ireland's Eye (see **Figure 1**). The submitted EIAR (Jacobs and Tobin, 2018) and 2023 Addendum (Jacobs, 2023) assess trenching / lay operations and diffuser installation, concluding short-lived SSC increases during trenching and placement, with rapid dispersion by ebb / flood tidal currents, and no significant residual deposition beyond the immediate works footprint. Additionally, all of the plume discharge is predicted to disperse to the north (i.e., away from the CWP Project) of the proposed outfall pipeline route following a controlled discharge. Planning consent was granted July 2025, and the marine foreshore application records the detailed route, construction method, and mitigation.
21. Howth Fishery Harbour Centre (FHC) dredging and reclamation will remove approximately 240,000 m³ of sediment from the harbour to restore safe depths; treated dredge material will then be reused to create 4.8 ha of reclaimed land behind a rock-armoured perimeter. EIAR assessments (Malachy Walsh and Partners, 2021) report that SSC elevations during dredging are largely contained within the harbour, with minimal egress beyond the mouth, any potential suspended sediment which is present beyond the mouth is anticipated to be transported westward (i.e., away from the CWP Project), and no significant off-site deposition once stabilised materials are placed within the reclamation cell.
22. Dublin Array Offshore Wind Farm is located circa 10 km off the Dublin / Wicklow coast, with its offshore export cable corridor making landfall near Shanganagh. Due to its proximity to the CWP Project, an overlap in construction works could result in elevated SSC levels within the MAC application boundary and across the region. Physical processes modelling undertaken for the EIAR (BOWL and KOWL, 2025), predicts that SSC plumes generated during foundation installation or cable trenching remain highly localised, typically extending only a few hundred metres from the activity footprint. Importantly, any cumulative interaction is only predicted if the installation of the Dublin Array export cable occurs concurrently with CWP works, as SSC and associated deposition from these activities are highly transient and spatially confined. The seabed in this area is dominated by coarse sands and gravels, meaning coarse material settles rapidly while finer fractions disperse and dilute under the semi-diurnal tidal regime. Consequently, SSC elevations would be short-lived, with concentrations returning to baseline within days to weeks following disturbance. Interaction between Dublin Array construction plumes and CWP activities is therefore expected to be minimal and temporary, with no measurable plume coalescence.
23. Arklow Bank Phase 2 (ABWP2) is located approximately 10 km east of Arklow in County Wicklow. Due to the separation distance associated with ABWP2 and the CWP Project (> 10 km), significant interaction of suspended sediment plumes with the CWP Project is considered highly unlikely. Modelling undertaken for the EIAR submission (SSE Renewables, 2024) indicates that SSC plumes generated during foundation installation or cable burial remain localised, with maximum extents observed up to 8 km from the point of disturbance. Furthermore, the prevailing tidal regime strongly influences plume advection, with SSC transported northward on flood tides and southward on ebb tides. This alternating alignment inhibits plume coalescence between projects, even under conservative assumptions of temporal overlap. Combined with the coarse-grained nature of the seabed, which promotes rapid settling of disturbed material, any SSC elevation would be short-lived and spatially confined. This potential increase is likely to be transient and spatially limited because the seabed is dominantly comprised of coarse sediments, meaning most sediments liberated during construction would deposit locally. Finer sediments, which remain in suspension longer and thus have a greater likelihood of interacting with plumes generated by construction activities at Dublin Array OWF, will be quickly dispersed by the prevailing tidal regime, resulting in SSCs returning to baseline levels over a period of days to weeks following completion of the construction activities.

24. Given the findings described above, should offshore construction works for the CWP Project coincide with disposal activities associated with Dublin Port maintenance dredging or capital dredging works under the MP2 development, the Dublin Harbour Capital Dredging programme, the Dublin 3FM Project, Greater Dublin Drainage marine outfall works, Howth Fishery Harbour Centre dredging and reclamation, or construction of Dublin Array and Arklow Bank Phase 2 offshore wind farms, it is highly unlikely that this would lead to significant cumulative impacts. For dredging projects, the distance between most dredging works or offshore disposal areas and the CWP array site or offshore export cable corridor is substantial, far exceeding the predicted lateral extent of sediment plumes (typically < 1 km) from dredging activities. For Dublin Array, any overlap in SSC is only predicted if export cable installation occurs concurrently with CWP works, as SSC and associated deposition from these activities are highly transient and spatially confined; foundation installation plumes are not expected to interact. If such overlap were to occur, SSC elevations would remain short-lived and localised, rapidly dissipating following cessation of activities, and would not result in measurable plume coalescence or any increase in effect magnitude beyond that of the standalone projects. Considering Arklow Bank Phase 2, the separation distance (> 10 km) and tidal alignment inhibit coalescence. Across all projects, SSC elevations would be temporary, with concentrations returning to baseline within days to weeks following disturbance. Consequently, considering the cumulative effects on SSC and associated deposition from CWP in combination with the other developments, no significant cumulative effects are anticipated.

Cumulative Impact 2: Temporary disturbance of the seabed resulting from pre-sweeping / sandwave levelling activities leading to increases in suspended sediment concentrations and associated deposition.

25. As described in **Chapter 6 Marine Geology, Sediments and Coastal Processes Section 6.10**, a Minor impact resulting from an increase in SSC levels is anticipated for marine geology, sediments and coastal processes receptors during the construction phase when the Proposed Development is considered separately.
26. As the physical mechanism for Impact 2 is analogous to Impact 1, the cumulative assessment draws on the same evidence base; across all developments, SSC elevations would be temporary, with concentrations returning to baseline within days to weeks following disturbance. Consequently, considering the cumulative effects on SSC and associated deposition from CWP pre-sweeping in combination with other developments, no significant cumulative effects are anticipated.

Cumulative Impact 3: Alteration to seabed and intertidal morphology during seabed preparation and cable installation activities.

27. As described in **Chapter 6 Marine Geology, Sediments and Coastal Processes Section 6.10**, a Minor impact resulting from localised alteration to the hydrodynamic, wave and sediment regimes and coastal processes is anticipated for marine geology, sediments and coastal processes receptors during the construction phase when the Proposed Development is considered separately.
28. Given the highly localised nature of effects associated with alteration to seabed morphology resulting from seabed preparation during the construction phase when the project is considered separately (see **Section 6.6.5** and **Section 6.10** of **Chapter 6** of the EIAR), and the similar conclusions drawn with regard the adjacent Dublin Array and Arklow Bank Phase 2 OWF projects (BOWL and KOWL, 2025; SSE Renewables, 2024), there is no likelihood of interaction between these projects. For dredging projects such as Dublin Port Capital Dredging, MP2, Dublin 3FM, Greater Dublin Drainage, and Howth Fishery Harbour Centre, morphological changes are restricted to harbour basins or the immediate offshore disposal site footprint, with no measurable influence on intertidal areas beyond the works (Jacobs and Tobin, 2018; Malachy Walsh and Partners, 2021; RPS, 2021a; RPS, 2021c; RPS, 2024).

Therefore, there is no significant cumulative effects anticipated for the combination of other developments with the CWP Project.

Cumulative Impact 4: Localised alteration to the hydrodynamic, wave and sediment regimes and coastal processes.

29. As described in **Chapter 6 Marine Geology, Sediments and Coastal Processes Section 6.10**, a Minor impact resulting from localised alteration to the hydrodynamic, wave and sediment regimes and coastal processes is anticipated for marine geology, sediments and coastal processes receptors during the construction phase when the Proposed Development is considered separately.
30. Effects related to the alteration of the hydrodynamic, wave and sediment regimes are highly localised and occur primarily around individual foundation footprints and cable installation corridors, where flow acceleration or sheltering can temporarily modify near-bed currents and sediment transport. For adjacent offshore wind farms such as Dublin Array and Arklow Bank Phase 2, similar localised changes are predicted during construction, but modelling and hydrodynamic assessments undertaken for Codling and the respective projects indicate that these changes dissipate rapidly within a few hundred metres of the structures and do not propagate at scales that would influence regional tidal or wave regimes (BOWL and KOWL, 2025; SSE Renewables, 2024). Given the separation distances between projects (> 10 km for Arklow Bank Phase 2 and several kilometres for Dublin Array) and the alternating north - south tidal alignment along the Eastern Irish Seaboard, there is no realistic potential for interaction of these localised flow modifications. For dredging projects such as Dublin Port Capital Dredging, MP2, Dublin 3FM, Greater Dublin Drainage, and Howth Fishery Harbour Centre, hydrodynamic modelling confirms that changes to flow patterns are confined to harbour basins or the immediate vicinity of the offshore disposal site, with no measurable influence on regional tidal or wave regimes (Jacobs and Tobin, 2018; Malachy Walsh and Partners, 2021; RPS, 2021a; RPS, 2021c; RPS, 2024). Consequently, even under conservative assumptions of temporal overlap, there are no significant cumulative effects on hydrodynamics, wave climate, sediment transport pathways, and coastal processes anticipated during construction.

3.5.2 Operation and maintenance phase

Cumulative Impact 1: Localised alteration of hydrodynamic and wave conditions across the site and effects on the sediment transport regime and coastal processes.

31. As discussed in **Chapter 6 Marine Geology, Sediments and Coastal Processes Section 6.10**, a Minor impact resulting from alteration to the hydrodynamic, wave and sediment regimes and coastal processes is anticipated for marine geology, sediments and coastal processes receptors when the CWP Project is considered separately.
32. For cumulative assessment, the relevant projects during operation are Dublin Array and Arklow Bank Phase 2 offshore wind farms. Both developments introduce turbine foundations and associated infrastructure that can create wake effects and minor changes to flow patterns. Physical process modelling for Dublin Array (BOWL and KOWL, 2025) indicates that wake-induced turbulence persists for several hundred metres to a few kilometres downstream of individual turbines or turbine rows but dissipates rapidly under the semi-diurnal tidal regime. Given the alignment of rectilinear tides along the Eastern Irish Seaboard (see **Section 6.6.2 of Chapter 6** of the EIAR, and **Section 1.6** of BOWL and KOWL, 2025) and the spatial separation between arrays, cumulative wake effects are expected to be minor and confined locally, with no significant alteration to the regional tidal regime. Similarly, for Arklow Bank Phase 2, the > 10 km separation from CWP further limit any interaction of wake zones. These effects are localised and transient, and modelling (SSE Renewables, 2024) supports that they

do not propagate at scales that would influence regional hydrodynamics or sediment transport pathways.

33. In regard to the potential for restricted sediment supply impacting the regional and local sediment regime and seabed and sandbank morphology, composition and structure, it is important to consider the contemporary sediment supply which maintains the majority of sand banks along the eastern Irish Seaboard. Banks are maintained in dynamic equilibrium dominantly by reworked sediments, with smaller contributions from the coast and fluvial sources. When the origin and maintenance hypotheses for linear sandbanks suggested by Dyer and Huntley (1999) is considered, it is reasonable to conclude that the contemporary supply of sediment from the coastline and from reworked marine sediments is broadly limited and that the region, in terms of sediment supply / loss is in broad equilibrium. Across the lifetime of the CWP Project, where sediment supply is maintained and the local hydrodynamic regime broadly remains the same (a conclusion which is supported by project specific modelling and the broader evidence base), there is no evidence to suggest that the sediment transport regime, seabed morphology and large-scale bathymetric patterns will significantly alter. The future long-term development of the sandbanks in the region is linked to changes in mean sea level, coastal recession (including anthropogenic response), sediment supply and flow interactions. As the cumulative effects of the CWP Project and other projects is anticipated to have a minor impact upon the prevailing tidal and wave regime, it is reasonable to conclude that the cumulative effects on sediment transport pathways, and the rate and magnitude of supply / loss from the wider system will remain broadly uninterrupted.
34. Though the presence of windfarm infrastructure across the region will have an effect on sediment transport, manifested at the turbine / seabed infrastructure scale by either blocking or enhancing sediment transport due to flow acceleration as the flow passes the structure, these effects are localised and are not anticipated to lead to more significant effects on the structure or composition of the seabed morphology and sandbanks across the region for the other developments in combination with the CWP Project.

Cumulative Impact 2: Scour around installed structures and associated sediment transportation and deposition leading to changes in seabed composition, structure or morphology.

35. As described in **Chapter 6 Marine Geology, Sediments and Coastal Processes Section 6.10**, a Minor impact resulting from scour around installed structures and associated sediment transportation and deposition leading to changes in seabed composition, structure or morphology is anticipated for marine geology, sediments and coastal processes receptors during the operational phase when the CWP Project is considered separately.
36. For cumulative assessment, the relevant projects are Dublin Array and Arklow Bank Phase 2 offshore wind farms. Scour effects occur within a highly localised radius around individual foundations (e.g., monopiles or jackets), where flow acceleration and turbulence can mobilise sediments and create small-scale scour pits. These changes are confined to the immediate footprint of each structure and do not propagate beyond a few tens of metres. Given the separation distances between arrays, there is no realistic potential for interaction of scour zones or associated sediment transport pathways, and no significant cumulative effects are anticipated for the other developments in combination with the CWP Project. Similarly at a regional scale the cumulative appearance of scour zones or associated sediment transport pathways are not anticipated to meaningfully change the regional sediment envelope, a key determinant of regional habitats.

Cumulative Impact 3: Operation and maintenance

37. As described in **Chapter 6 Marine Geology, Sediments and Coastal Processes Section 6.10**, a Minor impact resulting from operation and maintenance works is anticipated for marine geology, sediments and coastal processes receptors during the operational phase when the CWP Project is considered separately.
38. For dredging projects such as Dublin Port Capital Dredging, MP2, Dublin 3FM, Greater Dublin Drainage, and Howth Fishery Harbour Centre, operational phases do not involve continuous seabed disturbance beyond routine maintenance dredging within harbour limits, which is spatially separated from the CWP site. Consequently, there is no realistic potential for interaction between these activities and CWP maintenance works.
39. Similarly, given the transient nature of impacts resulting from operation and maintenance when the project is considered separately, and the similar conclusions drawn with regard to the proximal OWFs (Dublin Array and Arklow Bank Phase 2), there is no likelihood of interaction between these projects and thus no significant cumulative effects are anticipated. Consequently, no significant cumulative effects are anticipated for the other developments in combination with the CWP Project.

3.6 CEA summary

40. This CEA, which supports EIAR **Volume 3, Chapter 6** has assessed the potential cumulative effects on Marine Geology, Sediments and Coastal Processes from the construction and operation and maintenance phases of the CWP Project alongside other development.
41. **Table 3-3** below has been adopted from the PINS advice on CEA for NSIPs (PINS, 2024) as a means of summarising the potential adverse or beneficial cumulative effects of the CWP Project with other development. It summarises the outcomes of the detailed assessment provided above and sets out the proposed mitigation measures needed to address cumulative effects, if deemed necessary.
42. In summary, the CEA for Marine Geology, Sediments and Coastal Processes does not identify any significant cumulative effects resulting from the CWP Project alongside other development.

Table 3-3 Summary of cumulative effects assessment

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
Construction phase				
Cumulative Impact 1: Temporary disturbance of the seabed resulting from pre-installation methods and effects, cable and monopile installation leading to increases in suspended sediment concentrations and associated deposition				
OWF_01; OWF_02; CA_40 / DAS_04; DAS_19; DAS_03; DAS_16; CA_33; CA_11; and, CA_45.	1	Minor adverse (not significant in EIA terms)	No additional mitigation required	Minor adverse (not significant in EIA terms)
Cumulative Impact 2: Temporary disturbance of the seabed resulting from pre-sweeping / sandwave levelling activities leading to increases in suspended sediment concentrations and associated deposition.				
OWF_01; OWF_02; CA_40 / DAS_04; DAS_19; DAS_03; DAS_16;	1	Minor adverse (not significant in EIA terms)	No additional mitigation required	Minor adverse (not significant in EIA terms)

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
CA_33; CA_11; and, CA_45.				
Cumulative Impact 3: Alteration to seabed and intertidal morphology during seabed preparation and cable installation activities.				
OWF_01; OWF_02; CA_40 / DAS_04; DAS_19; DAS_03; DAS_16; CA_33; CA_11; and CA_45.	1	Minor adverse (not significant in EIA terms)	No additional mitigation required	Minor adverse (not significant in EIA terms)

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
Cumulative Impact 4: Localised alteration to the hydrodynamic, wave and sediment regimes and coastal processes				
OWF_01; OWF_02; CA_40 / DAS_04; DAS_19; DAS_03; DAS_16; CA_33; CA_11; and CA_45.	1	Minor adverse (not significant in EIA terms)	No additional mitigation required	Minor adverse (not significant in EIA terms)
Operation and maintenance phase				
Cumulative Impact 1: Localised alteration of hydrodynamic and wave conditions across the site and effects on the sediment transport regime and coastal processes.				
OWF_01; and OWF_02.	1	Minor adverse (not significant in EIA terms)	No additional mitigation required	Minor adverse (not significant in EIA terms)
Cumulative Impact 2: Scour around installed structures and associated sediment transportation and deposition leading to changes in seabed composition, structure or morphology.				
OWF_01; and OWF_02.	1	Minor adverse (not significant in EIA terms)	No additional mitigation required	Minor adverse (not significant in EIA terms)
Cumulative Impact 3: Operation and maintenance				

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
OWF_01; OWF_02; CA_40 / DAS_04; DAS_19; DAS_03; DAS_16; CA_33; CA_11; and CA_45.	1	Minor adverse (not significant in EIA terms)	No additional mitigation required	Minor adverse (not significant in EIA terms)

3.7 References

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4 MARINE WATER QUALITY

4.1 Introduction

54. This section of the **CEA Report** presents the findings of the CEA for **Chapter 7 Marine Water Quality**, which considers the residual effects presented in **EIAR Volume 3, Chapter 7 Marine Water Quality** alongside the potential effects of other proposed and reasonably foreseeable development. Cumulative effects are considered in this document across the construction and operation and maintenance phases of the CWP Project.
55. Updates to the project alone assessment for **Chapter 7 Marine Water Quality** as a consequence of ACPs FIR are presented in Section 7 of the **EIAR Addendum**. This updated CEA incorporates relevant updates from the project alone assessment and has been updated in response to the requests made in item 5 of the FIR.

4.2 Consultation

56. Stakeholder feedback received during the consultation process that is relevant to the marine water quality impact assessment is provided in **Volume 3, Chapter 7 Marine Water Quality** of the EIAR.
57. No feedback specific to the CEA for marine water quality was received during the pre-application consultation phase. Stakeholder feedback on the CEA in response to the CWP Project planning application has been responded to in the **FIR Response Document** and the **Observations Response Document**, including confirmation of any updates made in response to the feedback received.

4.3 CEA impact screening

58. The first step in the CEA for marine water quality is the identification of which residual impacts assessed for the CWP Project alone have the potential for a cumulative impact with other development (described as 'impact screening'). This screening exercise is set out in **Table 4-1** below.
59. Only potential impacts assessed in **Volume 3, Chapter 7 Marine Water Quality** as 'not significant' or above are included in the CEA (i.e. those assessed as 'imperceptible' are not taken forward as there is no potential for them to contribute to a cumulative effect).

Table 4-1 Impacts and potential for cumulative effect

Impact	CWP Project alone residual effect	Potential for significant cumulative effect – screened into the CEA (Yes / No)
Construction		
Direct temporary disturbance resulting in temporary increases in SSC	Not significant.	Yes
Direct disturbance resulting in resuspension of contaminated sediments	Not significant.	Yes

Impact	CWP Project alone residual effect	Potential for significant cumulative effect – screened into the CEA (Yes / No)
Accidental pollution events	Negligible	No
Operation		
Direct temporary disturbance resulting in temporary increases in SSC	Not significant.	Yes
Direct disturbance resulting in resuspension of contaminated sediments	Not significant.	Yes
Accidental pollution events	Negligible	No
Decommissioning		
Direct temporary disturbance resulting in temporary increases in SSC	The detail and scope of the decommissioning works for the CWP Project will be determined by the relevant legislation and guidance at the time of decommissioning. Project alone impacts during the decommissioning phase of the CWP Project are assessed in Chapter 7 Marine Water Quality. It is anticipated that the impacts will be no greater than those identified for the construction phase, and therefore no separate assessment of cumulative impacts during the decommissioning phase is presented within this CEA.	
Direct disturbance resulting in resuspension of contaminated sediments		
Accidental pollution events		

4.4 Stage 3: Information gathering and ‘other development’ screening

60. Stage 2 of the CEA is presented in **Appendix 1** of **Part 1** of the **CEA Report**. This exercise established a shortlist of other development for marine water quality using set screening criteria.
61. The shortlist of other development screened into the CEA for marine water quality at Stage 2 are listed below.
- SSE Renewables – Arklow Bank Wind Park 2 OWF Phase 2 (OWF_01);
 - RWE Renewables – Dublin Array (OWF_02);
 - Dublin Port Company – Dredging and Dumping at Sea arising from the Dublin Harbour Capital Dredging Project (DAS_19);
 - Dublin Port Company – MP2 Project (CA_16);
 - Dublin Port Company - Dumping at Sea arising from capital dredging works under the MP2 Project (DAS_03);
 - Dublin Port Company - 3FM Project (CA_33);
 - Statkraft – North Irish Sea Array (OWF_04);
 - Sure Partners Limited - Arklow Bank Wind Park 2 O&M Facility (CA_30);
 - Minister for Agriculture, Food and the Marine - Development at Howth Fishery Harbour Centre (dredging and reclamation works) (CA_11);
 - Irish Water - Greater Dublin Drainage Project (CA_45);
 - Microsoft – SOBR1 subsea fibre optic cable (SC_03);
 - Microsoft - SOBR2 subsea fibre optic cable (SC_06); and

- MaresConnect Limited - MaresConnect Interconnector (SC_11).

62. Information gathering (Stage 3 of the CEA) has enabled a further review of the other development shortlist for marine water quality, including a more detailed consideration of the location, nature and scale of the development, the timing of construction and operation activities, the information available to inform a CEA and the likelihood of a significant effect.
63. This information has been used to screen the Stage 2 shortlist to establish a final list of other development for detailed assessment at Stage 4 of the CEA. The results of the exercise are presented in **Table 4-2** below.

Table 4-2 Summary of other development screened into the CEA for marine water quality

Development	Distance from the array site (km)	Distance from the export cable corridor	Tier	Included in the CEA (Yes/No)	Rationale
Ref: OWF_01 Project: Arklow Bank Wind Park 2 Developer: SSE Renewables Planning Ref: OA27.319864	9.3	17.6	1	Yes	Site investigations Offshore wind farm installation Potential cumulative impact exists – screened in
Ref: OWF_02 Project: Dublin Array Developer: RWE Planning Ref: OA06D.321992	2.8	0	1	Yes	Offshore wind development Potential cumulative impact exists – screened in
Ref: DAS_19 Project: Dredging and Dumping at Sea arising from the Dublin Harbour Capital Dredging Project Developer: Dublin Port Company Planning Ref: S0033-01 and FS007164	23.2	3.7	1	Yes	Dredge and disposal works Potential cumulative impact exists – screened in
Ref: DAS_03 Project: Dumping at Sea arising from capital dredging works under the MP2 Project Developer: Dublin Port Company Planning Ref: S0024-02	23.2	3.7	1	Yes	Dredge disposal works Potential cumulative impact exists – screened in

Development	Distance from the array site (km)	Distance from the export cable corridor	Tier	Included in the CEA (Yes/No)	Rationale
Ref: CA_16 Project: MP2 Project Developer: Dublin Port Company Planning Ref: PA29N.304888	25.1	4.2	1	Yes	Port development works (including dredging) Potential cumulative impact exists – screened in
Ref: CA_33 Project: 3FM Project Developer: Dublin Port Company Planning Ref: PA29N.320250	31.3	0.6	1	No	Onshore building work only. Assume suitable mitigation applied to ensure no impact on marine water quality
Ref:OWF_04 Project: North Irish Sea Array Developer: Statkraft Planning Ref: OA29N.319866	51	35.7	1	Yes	Site investigations Offshore wind farm development Potential cumulative impact exists – screened in
Ref: SC_03 Project: SOBR1 subsea fibre optic cable Developer: Microsoft Planning Ref: N/A	27	1.1	3	No	Proposed project with no fixed timeline Screened out
Ref: SC_06 Project: SOBR2 subsea fibre optic cable Developer: Microsoft Planning Ref: N/A	35	10.9	3	No	Proposed project with no fixed timeline Screened out
Ref: SC_11 Project: MaresConnect Interconnector Developer: MaresConnect Limited	43.2	19.6	3	No	Construction expected to be complete in 2029 No temporal overlap

Development	Distance from the array site (km)	Distance from the export cable corridor	Tier	Included in the CEA (Yes/No)	Rationale
Planning Ref: N/A					Screened out
Ref: CA_30 Project: Arklow Bank Wind Park 2 O&M Facility Developer: Sure Partners Limited Planning Ref: WCC 211316	30.8	33.1	1	Yes	Port development works (including dredging) Potential cumulative impact exists – screened in
Ref: CA_40 / DAS_04 Project: Maintenance Dredging in Dublin Port Developer: Dublin Port Company Planning Ref: FS007132 and S0004-03	32.2	0.8	1	No	Dredging through 2022-2029 No temporal overlap – Screened out
Ref: CA_11 Project: Development at Howth Fishery Harbour Centre (dredging and reclamation works) Developer: Minister for Agriculture, Food and the Marine Planning Ref: PL06F.314487	22.4	8	1	Yes	Port development works (including dredging) Potential cumulative impact exists – screened in
Ref: CA_45 Project: Greater Dublin Drainage Project Developer: Irish Water Planning Ref: PL06F.314488	33.1	9.9	1	Yes	Offshore infrastructure development works Potential cumulative impact exists – screened in

4.5 Stage 4: Assessment of cumulative effects

4.5.1 Construction phase

Cumulative Impact 1: Direct temporary disturbance resulting in temporary increases in SSC

64. This impact relates to seabed preparation for foundations and cables, jack-up and anchoring operations, and cable installation. Temporary increases in SSC have the potential to impact marine water quality within and outside of the offshore development area. The representative scenario is based upon the dredging / disposal and trenching works that will take place as part of the CWP Project. The greatest predicted impacts can be summarised as follows.

Dredging and dredge disposal

65. Suspended sediment plumes created during dredge disposal operations are predicted to enhance SSC levels in the near field (i.e. to the point of release) and far field (i.e. up to c. 7 km from the point of release).
66. The predicted transport of sediment plumes and subsequent deposition during dredge disposal activities within the offshore development area can be summarised as follows.
67. Modelled representative scenarios of dredge disposal activities within the array site indicated the predominant direction of travel for SSC plumes is north – south / slight eastward (away from shore). In one scenario, a maximum transient increase in SSC of 250 mg/L was predicted to travel a maximum of up to 7 km over c. 11 days. Modelled representative scenarios of dredge disposal activities within the OECC predicted: a maximum transient increase in SSC of 400 mg/L, travelling up to 6 km. A final scenario predicted a maximum increase in SSC of 125 mg/L, travelling a maximum of 4 km north - south.

Trenching

68. A consequence of cable installation will be the liberation of sediment into suspension within the water column, just above the seabed. Jetting results in greater sediment suspension, introducing the potential for distribution of greater volumes of material over a larger spatial area than other cable-laying techniques which may be employed during construction and thus is assessed as the representative scenario. This method involves fluidising the material to form a narrow trench into which the cable is laid.
69. Based upon the representative scenario, the predicted transport of sediment plumes generated during cable installation activities across the array site indicates the finest sediments will potentially be transported eastward up to 6 km at an increase of 80 mg/L. However, this plume is transient, rapidly decreasing as sand-sized sediments deposit to the bed and finer sediments are dispersed.
70. The predicted transport of sediment plumes generated during cable installation activities across the OECC were for a maximum increase in SSC of 140 mg/L being transported for up to 5 km north – south / slight eastward.

71. Enhanced SSC and the predicted deposition thickness would not be discernible above natural variation observed during storm events, with SSCs predicted, in the representative scenario, to reduce to baseline levels within c. 12 days following trenching operations.
72. When this impact was assessed for the CWP Project alone, the impact was assessed as imperceptible to slight / not significant for all water quality receptors, which is not significant in EIA terms.
73. Of the relevant projects, three are OWF developments of similar scale, five include dredge and disposal activities and one is an outfall pipeline. The other OWF developments are; Arklow Bank, Dublin Array and North Irish Sea Array, the dredge and disposal projects are the dredge and / or disposal projects in Dublin Port, Howth and one in Arklow (**Table 4-2**). Therefore, the impacts are likely to be similar to those predicted for the CWP Project. It was concluded for the CWP Project that, of all the modelled scenarios, the maximum increase in SSC will be 400 mg/L and the maximum duration before reducing to background levels is 12 days. As it is highly unlikely that the impacts from all projects will be occurring simultaneously, the short duration of increased levels of SSC and rapid redistribution of sediments ensures there will not be change in magnitude, and therefore significance, of the predicted impact from the cumulative impact of other developments. However, even if multiple developments all undertook activities concurrently, there would still be a rapid settlement of sediments and the return to background SSC conditions predicted. Considering any increase in SSC arising from any or all developments will be short term, there will not be a change in the magnitude, and therefore significance, of the predicted impact.
74. Therefore, it is concluded that the magnitude of the impact will not be increased by the identified 'other' developments. As such, it is concluded that for the CWP Project and Tier 1 projects that the effect of increased SSC will be **Not Significant**. There are no Tier 3 projects of relevance, or for which there is adequate information to undertake a meaningful assessment. As such, there are anticipated to be no significant cumulative effects of CWP with Tier 3 projects; the same conclusion being drawn for Tier 1, Tier 2 and Tier 3 combined.

Cumulative Impact 2: Direct disturbance resulting in resuspension of contaminated sediments

75. Remobilisation of contaminated sediments can occur when such sediments are disturbed and enter the water column and are transported and redeposited elsewhere. As such, the area over which this may apply, and the marine water quality receptors, are considered analogous to that described above for direct disturbance resulting in temporary increases in SSC.
76. In the CWP Project baseline site-specific survey, contaminated sediment results showed low levels of chemical contaminants at stations sampled within the CWP Project area. The majority of contaminants levels at sampled stations were below the Irish lower action level (AL) and Cefas AL1 (**Appendix 8.3 Benthic Baseline Report, Appendix 8-A 2025 Benthic Baseline Report, and Appendix 8-B Landfall and Intertidal Survey Report 2025**).
77. When this impact was assessed for the CWP Project alone the impact was assessed as imperceptible to not significant for all water quality receptors, which is not significant in EIA terms.
78. Contaminated sediment levels in and around other relevant Tier 1 OWF, dredging and dredge disposal projects are likely to be of the same low levels as found at the CWP Project, although higher levels may exist in the coastal project areas, as the main source of contaminants to the Irish Sea is largely from riverine discharges (Cefas, 2005).
79. The Irish Water outfall pipeline project is also a Tier 1 project but involves a much smaller area due to the nature of the projects and does not involve dredge disposal. While activities will have the likelihood of increasing SSC and deposition, the likely increase in remobilisation of contaminated sediments, given the requirements to mitigate where elevated levels of contamination are present, combined with

the smaller area and highly dynamic marine environments ensures there will not be a change in the magnitude, and therefore significance, of the predicted impact.

80. Given the low levels of sediment deposition expected to occur as a result of temporary disturbance (most modelled scenarios show sediment deposition of 0.04 m or less), and the low levels of contaminated sediments present in the Irish Sea, it is concluded that the magnitude, and therefore significance, of the impact will not be increased by the identified 'other' developments.
81. Therefore, it is concluded that the significance of the impact will not be increased by the identified other developments. As such, it is concluded that for the CWP Project and Tier 1 projects that the effect of the remobilisation of contaminated sediments will be **Not Significant**. There are no Tier 3 projects of relevance, or for which there is adequate information to undertake a meaningful assessment. As such, there are anticipated to be no significant cumulative effects with CWP cumulatively with Tier 3 projects; the same conclusion being drawn for Tier 1, Tier 2 and Tier 3 combined.

4.5.2 Operation and maintenance phase

Cumulative Impact 3: Direct temporary disturbance resulting in temporary increases in SSC

82. Only those developments, such as OWFs (Arklow Bank, Dublin Array and North Irish Sea Array), which require operational maintenance, have the potential to contribute to this cumulative effect. The scale of operational works that may increase SSC across all developments will be significantly reduced compared to construction, which for the other offshore wind projects will consist of annual WTG maintenance and cable inspections. Only operations requiring large component repair or replacement at OWFs are anticipated to result in increases in SSC, which would be local to the repair site and short in duration. Cable repairs, reburial or maintenance are not likely to be required for any project, though any required reburial will utilise similar methodology to installation but will only be required in discrete sections. As such, it is considered that the impact across all screened-in projects will remain localised, and considerably lower than that during construction. The magnitude, and therefore significance, is not considered to increase, based upon the cumulative assessment over that determined for the project alone.
83. As such, it is concluded that for the CWP Project and Tier 1 projects the effect of direct temporary disturbance resulting in temporary increases in SSC will be **Not Significant**. There are no Tier 3 project of relevance, or for which there is adequate information to undertake a meaningful assessment. As such, there are anticipated to be **no significant** cumulative effects with CWP cumulatively with Tier 3 projects; the same conclusion being drawn for Tier 1, Tier 2 and Tier 3 combined.

Cumulative Impact 4: Direct disturbance resulting in resuspension of contaminated sediments

84. This impact is related to the cumulative impact of temporary increases in SSC during the operational phase. As such, it is considered that the impact across all screened in projects will remain localised, and considerably lower than that during construction. The magnitude, and therefore significance, is not considered to increase based upon the cumulative assessment over that determined for the project alone.
85. As such, it is concluded that for the CWP Project and Tier 1 projects the effect of direct disturbance resulting in resuspension of contaminated sediments will be **Not Significant**. There are no Tier 3 projects of relevance, or for which there is adequate information to undertake a meaningful assessment. As such there are anticipated to be no significant cumulative effects with CWP cumulatively with Tier 3 projects; the same conclusion being drawn for Tier 1, Tier 2 and Tier 3 combined.

4.6 CEA summary

86. This CEA, which supports EIAR **Volume 3, Chapter 7 Marine Water Quality** has assessed the potential cumulative effects on marine water quality from the construction and operation and maintenance phases of the CWP Project alongside other development.
87. **Table 4-3** below has been adopted from the PINS advice on CEA for NSIPs (PINS, 2024) as a means of summarising the potential adverse or beneficial cumulative effects of the CWP Project with other development. It summarises the outcomes of the detailed assessment provided above and sets out the proposed mitigation measures needed to address cumulative effects, if deemed necessary.
88. In summary, the CEA for marine water quality does not identify any significant cumulative effects resulting from the CWP Project alongside other development.

Table 4-3 Summary of other development screened into the CEA for marine water quality

ID	Tier	Significance of cumulative effect		Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
Construction phase					
Cumulative Impact 1: Direct temporary disturbance resulting in temporary increases in SSC					
- OWF_01 - OWF_02 - DAS_19 - CA_16 - CA_03 - OWF_04 - CA_30 - CA_11 - CA_45	1	Offshore waters (>1 NM)	Not Significant	No additional mitigation required	Not Significant (not significant)
		WFD waterbodies (<1 NM)	Slight to Slight / Not Significant (not significant)	Use of Cofferdam	Slight to Slight / Not Significant (not significant)
Cumulative Impact 2: Direct disturbance resulting in resuspension of contaminated sediments					
- OWF_01 - OWF_02 - DAS_19 - CA_16 - CA_03 - OWF_04 - CA_30 - CA_11 - CA_45	1	Offshore waters (>1 NM)	Imperceptible (not significant)	No additional mitigation required	Imperceptible (not significant)
		WFD waterbodies (<1 NM)	Not Significant	No additional mitigation required	Not Significant (not significant)

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect	
Operation and maintenance phase					
Cumulative Impact 1: Direct temporary disturbance resulting in temporary increases in SSC					
- OWF_01 - OWF_02 - OWF_04	1	Offshore waters (>1 NM)	Not Significant	No additional mitigation required	Slight / not significant (not significant)
		WFD waterbodies (<1 NM)	Slight / Not significant (not significant)	No additional mitigation required	Not Significant (not significant)
Cumulative Impact 2: Direct disturbance resulting in resuspension of contaminated sediments					
- OWF_01 - OWF_02 - OWF_04	1	Offshore waters (>1 NM)	Not Significant	No additional mitigation required	Not Significant (not significant)
		WFD waterbodies (<1 NM)	Slight / Not Significant (not significant)	No additional mitigation required	Slight / not significant (not significant)

4.7 References

89. Cefas (2005). Contaminant Status of the Irish Sea. CEFAS Contract report C2436. Available at: https://assets.publishing.service.gov.uk/media/5a7ac9c040f0b66a2fc02ce0/SEA6_Contaminant_CEFAS.pdf [Accessed: 09/11/23].
90. Department of Housing, Local Government and Heritage (DHLGH) (2020). Marine Strategy Framework Directive 2008/56/EC Article 17 update to Ireland's Marine Strategy Part 1: Assessment (Article 8), Determination of Good Environmental Status (Article 9) and Environmental Targets (Article 10) June 2020. Available at: <https://www.gov.ie/en/publication/2fe6c-marine-strategy-framework-directive-200856ec-article-17-update-to-irelands-marine-strategy-part-1-assessment-article-8-determination-of-good-environmental-status-article-9-and-environmental-targets-article-10/> [Accessed 07/08/23].
91. EPA (2022). Guidelines on the Information to be Contained in Environmental Impact Assessment Reports.
92. European Commission (1999). Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions.
93. Planning Inspectorate (PINS) (2019). Advice Note 17: Cumulative effects assessment relevant to nationally significant infrastructure projects. Available at: <https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/advice-note-17/> [Accessed: 09/11/23].

5 SUBTIDAL AND INTERTIDAL ECOLOGY

5.1 Introduction

94. This section of the **CEA Report** presents the findings of the CEA for Subtidal and Intertidal Ecology, which considers the residual effects presented in **Volume 3, Chapter 8 Subtidal and Intertidal Ecology** alongside the potential effects of other proposed and reasonably foreseeable development. Cumulative effects are considered in this document across the construction and operation and maintenance phases of the CWP Project.
95. The detail and scope of the decommissioning works for the CWP Project will be determined by the relevant legislation and guidance at the time of decommissioning. Project alone impacts during the decommissioning phase of the CWP Project are assessed in EIAR **Volume 3, Chapter 8 Subtidal and Intertidal Ecology**. It is anticipated that the impacts will be no greater than those identified for the construction phase, and therefore no separate assessment of cumulative impacts during the decommissioning phase is presented within this CEA.
96. Updates to the project alone assessment for Subtidal and Intertidal Ecology as a consequence of ACPs FIR are presented in **Section 8** of the **EIAR Addendum**. This updated CEA incorporates relevant updates from the project alone assessment and has been updated in response to the requests made in item 5 of the FIR.

5.2 Consultation

97. Stakeholder feedback received during the consultation process that is relevant to the subtidal and intertidal ecology impact assessment is provided in **Volume 3, Chapter 8 Subtidal and Intertidal Ecology** of the EIAR.
98. Stakeholder feedback on the CEA in response to the CWP Project planning application has been responded to in the **FIR Response Document** and the **Observations Response Document**, including confirmation of any updates made in response to the feedback received.

5.3 CEA impact screening

99. The first step in the CEA for subtidal and intertidal ecology is the identification of which residual impacts assessed for the CWP Project alone have the potential for a cumulative impact with other development (described as 'impact screening'). This screening exercise is set out in **Table 5-1** below.
100. Only potential impacts assessed in **Volume 3, Chapter 8 Subtidal and Intertidal Ecology** as ['not significant'] or above are included in the CEA (i.e. those assessed as 'imperceptible' are not taken forward as there is no potential for them to contribute to a cumulative effect).
101. In summary, Table 3 shows that there is the potential for cumulative effects on subtidal and intertidal ecology as a result of all potential impacts assessed in **Chapter 8 Subtidal and Intertidal Ecology**. Introduction of INNS (invasive non-native species) and Accidental Pollution Events which were assessed as Negligible in terms of magnitude of impact are screened out as primary mitigation measures remove the potential route to impact. Therefore, there is no potential for cumulative impacts from Introduction of INNS or Accidental Pollution Events.

Table 5-1 Impacts and potential for cumulative effect

Impact	CWP Project alone residual effect	Potential for significant cumulative effect – screened into the CEA (Yes / No)
Construction		
Temporary habitat disturbance	Not significant	Yes
Temporary increase in suspended sediment concentration (SSC)	Not significant	Yes
Remobilisation of contaminated sediments	Not significant	Yes
Introduction of INNS	Not significant	No
Accidental pollution events	Not significant	No
Operation		
Long-term habitat loss	Not significant	Yes
Habitat creation (increased hard substrate)	Not significant	Yes
Temporary habitat disturbance	Not significant	Yes
Presence of Electromagnetic Field (EMF) and / or temperature changes	Not significant	Yes
Introduction of INNS	Not significant	No
Accidental pollution events	Not significant	No
Decommissioning		
Temporary habitat disturbance	The detail and scope of the decommissioning works for the CWP Project will be determined by the relevant legislation and guidance at the time of decommissioning. Project alone impacts during the decommissioning phase of the CWP Project are assessed in Chapter 8 Subtidal and Intertidal Ecology. It is anticipated that the impacts will be no greater than those identified for the construction phase, and therefore no separate assessment of cumulative impacts during the decommissioning phase is presented within this CEA.	
Temporary increase in SSC		
Remobilisation of contaminated sediments		
Long-term habitat loss		
Introduction of INNS		
Accidental pollution events		

5.4 Stage 3: Information gathering and ‘other development’ screening

102. Stage 2 of the CEA is presented in **Appendix 1** of **Part 1** of the **CEA Report**. This exercise established a shortlist of other development for subtidal and intertidal ecology using set screening criteria.
103. The shortlist of other development screened into the CEA for subtidal and intertidal ecology at Stage 2 are listed below.
- SSE Renewables - Arklow Bank Wind Park 2 (OWF_1);
 - RWE – Dublin Array (OWF_02);
 - Dublin Port Company – Dredging and Dumping at Sea arising from the Dublin Harbour Capital Dredging Project (DAS_19);
 - Drogheda Port Company – Maintenance dredging River Boyne, Drogheda (CA_68/DAS_06);
 - Dublin Port Company – MP2 Project (CA_16);
 - Statkraft – Site investigation activities to inform the development of the North Irish Sea Array OWF (SUR_24);
 - Statkraft – North Irish Sea Array (OWF_04);
 - Microsoft – SOBR1 subsea fibre optic cable (SC_03);
 - Microsoft – SOBR2 subsea fibre optic cable (SC_06);
 - MaresConnect Limited – MaresConnect Interconnector (SC_11);
 - Minister for Agriculture, Food and the Marine Planning – Development at Howth Fishery Harbour Centre (dredging and reclamation works) (CA_11);
 - Sure Partners Limited – 3FM Project (CA_33);
 - Dublin Port Company – Maintenance Dredging in Dublin Port (CA_40/DAS_04); and
 - Dublin Port Company – Dumping at Sea arising from capital dredging works under the MP2 Project (DAS_03).
104. Information gathering (Stage 3 of the CEA) has enabled a further review of the other development shortlist for subtidal and intertidal ecology, including a more detailed consideration of the location, nature and scale of the development, the timing of construction and operation activities, the information available to inform a CEA and the likelihood of a significant effect.
105. This information has been used to screen the Stage 2 shortlist to establish a final list of other development for detailed assessment at Stage 4 of the CEA. The results of the exercise are presented in **Table 5-2** below.

Table 5-2 Summary of other development screened into the CEA for subtidal and intertidal ecology

Development	Distance from the array site (km)	Distance from the export cable corridor (km)	Tier	Included in the CEA (Yes/No)	Rationale
Ref: OWF_01 Project: Arklow Bank Wind Park 2 Developer: SSE Renewables Planning Ref: OA27.319864	9.3	17.6	1	Yes	Potential cumulative impact exists as development will have all the same impacts as CWP – screened in.
Ref: OWF_02 Project: Dublin Array Developer: RWE Planning Ref: OA06D.321992	2.8	0.0	1	Yes	Potential cumulative impact exists as development will have similar impacts as CWP – screened in.
Ref: DAS_19 Project: Dredging and Dumping at Sea arising from the Dublin Harbour Capital Dredging Project Developer: Dublin Port Company Planning Ref: S0033-01 and FS007164	23.2	3.7	1	Yes	Potential cumulative impact exists as development will have similar impacts as CWP – screened in.

Development	Distance from the array site (km)	Distance from the export cable corridor (km)	Tier	Included in the CEA (Yes/No)	Rationale
Ref: CA_68 / DAS_06 Project: Maintenance dredging River Boyne, Dogheda Developer: Drogheda Port Company Planning Ref: FS007028 and S0015-03	69.1	42.7	1	Yes	Potential cumulative impact exists as development will have similar impacts as CWP – screened in.
Ref: CA_16 Project: MP2 Project Developer: Dublin Port Company Planning Ref: PA29N.304888	25.1	4.2	1	Yes	Potential cumulative impact exists as development will have similar impacts as CWP – screened in.
Ref: SUR_24 Project: Site investigation activities to inform the development of the North Irish Sea Array OWF Developer: Statkraft Planning Ref: LIC230001	62.0	41.7	1	Yes	Potential cumulative impact exists as development will have all the same impacts as CWP – screened in.

Development	Distance from the array site (km)	Distance from the export cable corridor (km)	Tier	Included in the CEA (Yes/No)	Rationale
Ref: OWF_04 Project: North Irish Sea Array Developer: Statkraft Planning Ref: OA29N.319866	51.0	35.7	1	Yes	Potential cumulative impact exists as development will have similar impacts as CWP – screened in.
Ref: SC_03 Project: SOBR1 subsea fibre optic cable Developer: Microsoft Planning Ref: N/A	27.0	1.1	3	Yes	Potential cumulative impact exists as development will have similar impacts as CWP – screened in.
Ref: SC_06 Project: SOBR2 subsea fibre optic cable Developer: Microsoft Planning Ref: N/A	35.0	10.9	3	Yes	Potential cumulative impact exists as development will have similar impacts as CWP – screened in.
Ref: SC_11 Project: MaresConnect Interconnector Developer: MaresConnect Limited	43.2	19.6	3	Yes	Potential cumulative impact exists as development will have similar impacts as CWP – screened in.

Development	Distance from the array site (km)	Distance from the export cable corridor (km)	Tier	Included in the CEA (Yes/No)	Rationale
Planning Ref: N/A					
Ref: CA_11 Project: Development at Howth Fishery Harbour Centre (dredging and reclamation works) Developer: Minister for Agriculture, Food and the Marine Planning Ref: PL06F.314487	24.0	8.0	1	Yes	Potential cumulative impact exists as development will have similar impacts as CWP – screened in.
Ref: CA_30 Project: Arklow Bank Wind Park 2 O&M Facility Developer: Sure Partners Limited Planning Ref: WCC 211316	30.8	33.1	1	Yes	Potential cumulative impact exists as development will have similar impacts as CWP – screened in.
Ref: CA_33 Project: 3FM Project Developer: Dublin Port Company Planning Ref: PA29N.320250	31.3	0.6	1	Yes	Potential cumulative impact exists as development will have similar impacts as CWP – screened in.

Development	Distance from the array site (km)	Distance from the export cable corridor (km)	Tier	Included in the CEA (Yes/No)	Rationale
Ref: CA_40 / DAS_04 Project: Maintenance Dredging in Dublin Port Developer: Dublin Port Company Planning Ref: FS007132 and S0004-03	32.2	0.8	1	Yes	Potential cumulative impact exists as development will have similar impacts as CWP — screened in.
Ref: CA_45 Project: Greater Dublin Drainage Project Developer: Irish Water Planning Ref: PL06F.314488	33.1	9.9	1	Yes	Potential cumulative impact exists as development will have similar impacts as CWP – screened in.
Ref: DAS_03 Project: Dumping at Sea arising from capital dredging works under the MP2 Project Developer: Dublin Port Company Planning Ref: S0024-02	23.2	3.7	1	Yes	Potential cumulative impact exists as development will have similar impacts as CWP – screened in.

5.5 Stage 4: Assessment of cumulative effects

5.5.1 Construction phase

Cumulative Impact 1: Temporary habitat disturbance

106. When considering this impact for the CWP Project alone it relates to seabed preparation activities, jack up and anchoring operations, and cable installation. The impact of temporary habitat disturbance is confined to the boundaries of the CWP Project and as such only habitats within the boundaries have the potential be impacted. Only a small proportion (4–7%) of subtidal and intertidal habitats within the offshore development area had the potential to be impacted and it was concluded to be of an imperceptible to slight significance for all benthic subtidal and intertidal habitats which is **Not Significant**.
107. The proportion of habitat with the potential to be impacted by temporary habitat disturbance by the CWP Project is expected to be representative of the other developments occurring in the area (noting that there is insufficient data available for the Tier 3 project to undertake a meaningful assessment), particularly the other offshore wind farm projects and it is likely the impact arising from activities from each of the other projects assessed will also be confined to the boundaries of each project. Were each of the other projects to impact c. 7% of the habitat within their project boundaries with temporary habitat disturbance this would account for c. 0.2% of the benthic habitats within the cumulative impact screening area. Furthermore, the habitats disturbed by the other relevant port projects are likely to be impacting habitats that are already heavily disturbed and as such have benthic communities adapted to temporary habitat disturbance, such as the habitats found within the River Liffey (**Chapter 8, Subtidal and Intertidal Ecology**).
108. The impact is short term and occurs over a relatively small spatial extent, while the recoverability of all receptors to this impact is assessed as high, which means full recovery is expected within two years of the impact (Tyler-Walters et al., 2023), **Chapter 8, Subtidal and Intertidal Ecology**). As such, the impact is considered negligible in the context of the wider availability of these subtidal and intertidal habitats.
109. Therefore, it is concluded that the magnitude of the impact will not be meaningfully increased by the surrounding developments and that the cumulative effect of temporary habitat disturbance. As such, there are anticipated to be no significant cumulative effects with CWP cumulatively with other projects.

Cumulative Impact 2: Temporary increase in suspended sediment concentrations (SSC)

110. This impact relates to seabed preparation for foundations and cables, jack up and anchoring operations, and cable installation. Temporary increases in SSC have the potential to impact subtidal and intertidal habitats within and out with the CWP Project boundaries. The representative scenario is based upon the dredging / disposal and trenching works that will take place as part of the CWP Project. The greatest predicted impacts can be summarised as follows:

Dredging and dredge disposal

111. Suspended sediment plumes created during dredge disposal operations are predicted to enhance SSC levels in the near field (i.e. to the point of release) and far field (i.e. up to c. 7 km) from the point of release).

112. The predicted transport of sediment plumes and subsequent deposition during dredge disposal activities within the CWP Project can be summarised as follows:
113. Modelled representative scenarios of dredge disposal activities within the array site indicated the predominant direction of travel for SSC plumes is North-South / slight East. In one scenario, a maximum transient increase in SSC of 250 mg/L was predicted to travel a maximum of 7 km over c.11 days resulting in a cumulative sediment deposition thickness of c. 3 cm. In another a maximum increase of 250 mg/L was predicted to travel up to 6 km over c. 11 days resulting in a cumulative sediment deposition thickness of c. 3 cm. Modelled representative scenarios of dredge disposal activities within the offshore export cable corridor (OECC) predicted: a maximum transient increase in SSC of 400 mg/L, travelling 6 km North-South / slight East resulting in a cumulative sediment deposition thickness of c. 4 cm, near the disposal location. In a final scenario, a maximum increase in SSC of 125 mg/L, travelling a maximum of 4 km North-South resulting in a cumulative sediment deposition thickness of c. 3 cm, near the disposal location.

Trenching

114. A consequence of cable installation will be the liberation of sediment into suspension within the water column, just above the seabed. Jetting results in greater sediment suspension, introducing the potential for distribution of greater volumes of material over a larger spatial area than other cable laying techniques which may be employed during construction and thus is assessed as the representative scenario. This method involves fluidising the material to form a narrow trench into which the cable is laid.
115. Based upon the representative scenario, the predicted transport of sediment plumes generated during cable installation activities across the array site indicates the finest sediments will potentially be transported North-South / slight East up to 6 km over c. 11 days, at an increase of 80 mg/L, resulting in a cumulative sediment deposition thickness of c. 1 cm, near the release location. However, these plumes are transient, rapidly decreasing as sand-sized sediments deposit to the bed and finer sediments are dispersed.
116. The predicted transport of sediment plumes generated during cable installation activities across the OECC were for a maximum increase in SSC of 140 mg/L being transported for up to 5 km North-South / slight East, over c. 12 days, resulting in a cumulative sediment deposition thickness of c. 1 cm, near the release location.
117. Background levels of SSC are considered to be between 5–15 mg/L within the CWP Project.
118. All habitat types within the study area are considered to have the potential to be impacted by increased SSC.
119. When this impact was assessed for the CWP Project alone, only a very small proportion of the subtidal and intertidal habitats had the potential to be impacted (when assuming an even distribution of impact across the habitats) and the magnitude of this impact for all subtidal and intertidal receptors were assessed as negligible or low. The impact was assessed as imperceptible to slight for all benthic habitat receptors, which is **Not Significant**.
120. Sediment plume modelling for the CWP Project alone suggests that only subtidal and intertidal sediment habitats have the potential to be impacted by increases in SSC. As such, should other wind farm projects such as the Tier 1 Arklow Bank and Dublin Array have the potential to impact reef habitats within the cumulative effects screening area, there is no potential for cumulative impacts on these habitats from impacts from CWP Project. Furthermore, the types of rocky reef habitat that occur in Wicklow Reef Special Area of Conservation (SAC) and Rockabill to Dalkey Island SAC have high tolerance and recoverability to increases in SSC and sediment deposition (up to 5cm) (Stamp *et al.*, 2023; Stamp, 2016).

121. The relevant other projects include offshore wind farm developments, subsea cable projects, and dredging programmes. Therefore, the impacts are likely to be relatively similar to those predicted for the CWP Project. It was concluded that the sediment thickness will be less than 1-3 cm within the immediate vicinity followed by rapid natural dispersal and sediment movement to reduce to background levels within 11-12 days. As it is highly unlikely that the impacts from all projects will be occurring simultaneously, the short duration of increased levels of SSC, and rapid redistribution of sediments ensures there will not be change in magnitude of the predicted impact from the cumulative impact of other developments.
122. The other projects include site investigation project which will impact a much smaller area due to the nature of the project and do not involve dredge disposal. While activities will have the likelihood of increasing SSC, the combination of smaller areas and highly dynamic marine environments ensures there will not be a change in the magnitude of the predicted impact.
123. Therefore, it is concluded that the magnitude of the impact will not be significantly increased by the surrounding developments and the cumulative effect. As such, there are anticipated to be no significant cumulative effects with CWP cumulatively with other projects.

Cumulative Impact 3: Remobilisation of contaminated sediments

124. Remobilisation of contaminated sediments can occur when such sediments are disturbed and enter the water column and are transported and redeposited elsewhere. As such, the area over which this may apply, and the subtidal and intertidal habitat receptors, are considered analogous to that described above for temporary increase in SSC.
125. In the CWP baseline site specific survey, contaminated sediment results showed low levels of chemical contaminants at stations sampled within the offshore development area. The majority of contaminants levels at sampled stations were below the Irish Lower AL and Cefas AL¹. In the River Liffey, testing of contaminants by DPC showed no contaminants were found at levels above those of Cefas AL1 or above Irish Lower Action Levels.
126. When this impact was assessed for the CWP Project alone, only a very small proportion of the subtidal and intertidal habitats had the potential to be impacted (when assuming an even distribution of impact across the habitats) and the magnitude of this impact for all subtidal and intertidal receptors were assessed as negligible or low. The impact was assessed as imperceptible to slight for all benthic habitat receptors, which is **Not Significant**.
127. Contaminated sediment levels in and around other relevant offshore wind farm projects are likely to be of the same low levels as found at the CWP Project, although higher levels may exist in the coastal project areas as the main source of contaminants to the Irish Sea are largely from riverine discharges (Cefas, 2005).
128. The other projects include site investigation projects which will impact a much smaller area due to the nature of the projects and do not involve dredge disposal. While activities will have the likelihood of increasing SSC, and deposition, the likely increase in remobilisation of contaminated sediments, given the requirements to mitigate where elevated levels of contamination are present, combined with smaller areas and highly dynamic marine environments ensures there will not be a change in the magnitude of the predicted impact.

¹ The purpose of the lower action levels is to be able to categorise sediment as essentially “clean” and to allow the disposal at sea of such material considered not to pose a risk through contamination to the marine environment. [Addendum-to-2006-Guidelines-\(Marine-Insitute-2019\).pdf](#)

129. Given the low levels of sediment deposition expected to occur as a result of temporary habitat disturbance and the low levels of contaminated sediments present in the Irish Sea, it is concluded that the magnitude of the impact will not be significantly increased by the surrounding developments.
130. Therefore, it is concluded that the magnitude of the impact will not be significantly increased by the surrounding developments and the cumulative effect. As such, there are anticipated to be no significant cumulative effects with CWP cumulatively with other projects.

5.5.2 Operation and maintenance phase

Cumulative Impact 1: Long-term habitat loss

131. This impact relates to the impact from the installation of structures in the seabed such as OSS and WTG monopile foundations, including scour and cable protection. The impact of long-term habitat loss is confined to the boundaries of the CWP Project and as such only habitats within the boundaries have the potential to be impacted. When this impact was assessed for the CWP Project alone, only a very small proportion (0.4%) of subtidal and intertidal habitats within the offshore development area, had the potential to be impacted and the magnitude of impact was assessed as negligible for all relevant habitats. The impact of long-term habitat loss was concluded to be slight for all benthic subtidal and intertidal habitats which is **Not Significant**.
132. The proportion of habitats with the potential to be impacted by long-term habitat loss by the CWP Project is expected to be representative of the other developments occurring in the area, in particular offshore wind projects, and the impact arising from activities from each of the other projects assessed will also be confined to the boundaries of that project. As such, the impact is considered negligible in the context of the wider availability of these subtidal and intertidal habitats.
133. The other projects include site investigation projects, which will impact a much smaller area due to the nature of the project and does not involve meaningful habitat loss with regard to the habitats found within the offshore area in which the CWP project is proposed. As such, there will not be a change in the magnitude of the predicted impact.
134. Therefore, it is concluded that the magnitude of the impact will not be increased by the surrounding developments. As such, there are anticipated to be no significant cumulative effects with CWP cumulatively with other projects.

Cumulative impact 2: Habitat creation (increase in hard substrate)

135. The habitat areas within the CWP Project and other relevant projects, which are adversely affected by long-term habitat loss, are likely to be positively impacted by habitat creation through the colonisation on the hard substrates introduced. As such, only habitats within the boundaries of each project have the potential to be positively impacted by habitat creation.
136. The impact assessment for this impact for CWP Project activities alone are the same as those of long-term habitat loss in terms of Sensitivity and Magnitude and therefore for Significance, though the impact is positive. The impact from the other relevant projects will also be the same as that of their long-term habitat loss impact.
137. Therefore, it is concluded that the magnitude of the impact will not be increased by the surrounding developments. As such, there are anticipated to be no significant cumulative effects with CWP cumulatively with other projects.

Cumulative impact 3: Temporary habitat disturbance

138. When considering this impact for the CWP Project alone it relates to maintenance and repair activities required during the operation and maintenance phase. The impact of temporary habitat disturbance is confined to the boundaries of the CWP Project and as such only habitats within the boundaries have the potential be impacted.
139. It is anticipated that the level of temporary habitat disturbance caused by the maintenance and repair activities during operation and maintenance activities will be no greater than that generated by the installation during construction. Given this, the potential effects of this impact on the subtidal and intertidal habitats will be less than, or equal to, those of temporary habitat disturbance during construction which have been assessed as not significant.
140. Only a small proportion (4–7%) of subtidal and intertidal habitats within the offshore development area had the potential to be impacted and therefore it was concluded to be of an imperceptible to slight significance for all benthic subtidal and intertidal habitats which is **Not Significant**.
141. The proportion of habitat with the potential to be impacted by temporary habitat disturbance by the CWP Project is expected to be representative of the other developments occurring in the area (noting that there is insufficient data available for the Tier 3 projects to undertake a meaningful assessment), particularly the other offshore wind farm projects and it is likely the impact arising from activities from each of the other projects assessed will also be confined to the boundaries of each project. Were each of the other projects to impact c. 7% of the habitat within their project boundaries with temporary habitat disturbance this would account for c. 0.2% of the benthic habitats within the cumulative impact screening area. Furthermore, the habitats disturbed by the other relevant port projects are likely to be impacting habitats that are already heavily disturbed and as such have benthic communities adapted to temporary habitat disturbance, such as the habitats found within the River Liffey (**Chapter 8, Subtidal and Intertidal Ecology**).
142. The impact is short term and occurs over a relatively small spatial extent, while the recoverability of all receptors to this impact is assessed as high, which means full recovery is expected within two years of the impact (Tyler-Walters et al., 2023), **Chapter 8, Subtidal and Intertidal Ecology**. As such, the impact magnitude is considered negligible in the context of the wider availability of these subtidal and intertidal habitats.
143. Therefore, it is concluded that the magnitude of the impact will not be meaningfully increased by the surrounding developments and that the cumulative effect of temporary habitat disturbance. As such, there are anticipated to be no significant cumulative effects with CWP cumulatively other projects.

Cumulative impact 4: Presence of EMF and / or temperature changes

144. Transmission of electricity through subsea cables will lead to the generation of EMF and / or temperature changes. As described in the impact assessment for the CWP Project alone, there is a lack of evidence of the impacts of EMF on benthic invertebrate species and habitats while benthic fauna are considered sensitive only to acute increases in temperature and the sensitivity of the receptors were assessed as low.
145. There is approximately 145.8 km of OECC cable, 8.6 km of inter-connector cable and 139 km of inter-array cabling for the CWP Project, all of which has the potential to generate EMF and the magnitude of impact was assessed as low. This is likely to be representative of the other windfarm developments.

146. As the other projects, Dublin Port Capital Dredging Project and Dublin Port Company MP2 Project, are not power-generating developments, there will be no associated EMF for any of these projects, and as such they will not contribute to the cumulative impact.
147. Cable burial or protection is an industry standard practice. For the CWP Project, EMF levels, specifically the magnetic field that is created by power transmitting cables, are already below the background levels of the earth's magnetic field, and burial of the cables will reduce the received levels at the seabed considerably. Marine benthic fauna are considered sensitive to acute increases in temperature, though they can tolerate an increase of 2°C. Increases of 5°C can however have lethal effects, particularly in summer conditions (Tillin and Tyler-Walters, 2014). The burial depth for the export and inter array cables is 1.5–3 m and is therefore expected to be consistent with these predictions for the majority of the route. At this burial depth, temperature increases can be expected to remain between 0°C and 2°C in most circumstances, with no discernible increase in water temperature anticipated. As the other Tier 1 offshore wind projects will utilise these standard industry practices, there will be no significant contribution of EMF and / or temperature changes to the marine environment and therefore no change in magnitude.
148. Therefore, it is concluded that the magnitude of the impact will not be significantly increased by the surrounding developments. As such, there are anticipated to be no significant cumulative effects with CWP cumulatively with other projects.

5.6 CEA summary

149. This CEA, which supports EIAR **Volume 3, Chapter 8 Subtidal and Intertidal Ecology** has assessed the potential cumulative effects on Subtidal and Intertidal Ecology from the construction and operation and maintenance phases of the CWP Project alongside other development.
150. Table 5-3 summarising the potential adverse or beneficial cumulative effects of the CWP Project with other development. It summarises the outcomes of the detailed assessment provided above and sets out the proposed mitigation measures needed to address cumulative effects, if deemed necessary.
151. In summary, the CEA for Subtidal and Intertidal Ecology does not identify any significant cumulative effects resulting from the CWP Project alongside other development.

Table 5-3 CEA Summary

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
Construction phase				
Cumulative Impact 1: Temporary habitat disturbance				
• OWF_01; • OWF_02; • DAS_19; • CA_68 / DAS_06; • CA_16; • SUR_24; • OWF_04; • SC_03; • SC_06; • SC_11; • CA_11; • CA_30; • CA_33; • CA_40 / DAS_04; • CA_45; and • DAS_03.	1 and 3	Not significant	No additional mitigation required	Not significant

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
Cumulative Impact 2: Temporary increase in suspended sediment concentration				
• OWF_01; • OWF_02; • DAS_19; • CA_68 / DAS_06; • CA_16; • SUR_24; • OWF_04; • SC_03; • SC_06; • SC_11; • CA_11; • CA_30; • CA_33; • CA_40 / DAS_04; • CA_45; and • DAS_03.	1 and 3	Not significant	No additional mitigation required	Not significant
Cumulative Impact 3: Remobilisation of contaminated sediments				
• OWF_01; • OWF_02; • DAS_19; • CA_68 / DAS_06; • CA_16; • SUR_24; • OWF_04; • SC_03; • SC_06;	1 and 3	Not significant	No additional mitigation required	Not significant

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
• SC_11; • CA_11; • CA_30; • CA_33; • CA_40 / DAS_04; • CA_45; and • DAS_03.				
Operation and maintenance phase				
Cumulative Impact 1: Long term habitat loss				
• OWF_01; • OWF_02; • DAS_19; • CA_68 / DAS_06; • CA_16; • SUR_24; • OWF_04; • SC_03; • SC_06; • SC_11; • CA_11; • CA_30; • CA_33; • CA_40 / DAS_04; • CA_45; and • DAS_03.	1 and 3	Not significant	No additional mitigation required	Not significant

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
Cumulative Impact 2: Habitat creation (increased hard substrates)				
• OWF_01; • OWF_02; • DAS_19; • CA_68 / DAS_06; • CA_16; • SUR_24; • OWF_04; • SC_03; • SC_06; • SC_11; • CA_11; • CA_30; • CA_33; • CA_40 / DAS_04; • CA_45; and • DAS_03.	1 and 3	Not significant	No additional mitigation required	Not significant
Cumulative Impact 3: Temporary habitat disturbance				
• OWF_01; • OWF_02; • DAS_19; • CA_68 / DAS_06; • CA_16; • SUR_24; • OWF_04;	1 and 3	Not significant	No additional mitigation required	Not significant

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
• SC_03; • SC_06; • SC_11; • CA_11; • CA_30; • CA_33; • CA_40 / DAS_04; • CA_45; and • DAS_03.				
Cumulative Impact 4: Presence of EMF and/or temperature changes				
• OWF_01; • OWF_02; • OWF_04; • SC_03; • SC_06; • SC_11; • CA_30; and • CA_33.	1 and 3	Not significant	No additional mitigation required	Not significant

5.7 References

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6 FISH, SHELLFISH AND TURTLE ECOLOGY

6.1 Introduction

161. This section of the **CEA Report** presents the findings of the CEA for fish, shellfish and turtle ecology, which considers the residual effects presented in **EIAR Volume 3, Chapter 9 Fish, Shellfish and Turtle Ecology** alongside the potential effects of other proposed and reasonably foreseeable development. Cumulative effects are considered in this document across the construction and operation and maintenance phases of the CWP Project.
162. Updates to the project alone assessment for fish, shellfish and turtle ecology as a consequence of the Commission's FIR are presented in **Section 9** of the **EIAR Addendum**. This updated CEA incorporates relevant updates from the project alone assessment and has been updated in response to the requests made in item 5 Cumulative Impacts of the FIR.

6.2 Consultation

163. **Table 6-1** provides a summary of stakeholder and regulator feedback received during the consultation process that is relevant to the CEA for fish, shellfish and turtle ecology.

Table 6-1 Consultation responses relevant to the CEA for fish, shellfish and turtle ecology

Consultee	Comment	How issues have been addressed
Scoping responses		
Inland Fisheries Ireland (IFI) 25 January 2021 & 18 June 2021	Inland Fisheries would like to bring the applicant's attention to the potential for migratory species from Northern Ireland to be present, some recent scientific studies tracking seatrout have shown that these fish will migrate from the Northern Irish coast and along the Irish coastline and vice versa. Atlantic salmon have also been shown to migrate through the Irish Sea as part of their route back to or from Northern Irish Rivers. These transboundary species migrations should also be considered in the EIAR.	Transboundary species migrations have been included in within the cumulative effects assessment in Section 5.3 of the EIAR.
	Cumulative impacts should take cognisance of the Dublin Port Maintenance Dredging Programme & Strategic Infrastructure Projects planned.	Cumulative impacts, including Dublin Port activities, are scoped in under Section 6.4 , CEA 'other development' screening.
Marine Institute (MI)	It is the advice of the MI that the scale of effects of the proposed	Section 6.5 outlines the potential impacts which have been

Consultee	Comment	How issues have been addressed
3 February 2021	development be considered beyond the footprint of the turbines and the licenced area.	assessed at local, regional and national scale.
	The effects of Electromagnetic Fields (EMF) on electro-sensitive species deserve greater consideration. It would be important that the EIAR examined, in depth, the likely effects of the proposed development on a number of possible receptors. These include, shellfish species (crustaceans), elasmobranchs and demersal species.	The potential impact of EMF has been assessed for all potential receptors (shellfish species, elasmobranchs, and demersal species) in Section 6.5 .
Topic-specific meetings (summary of minuted discussions)		
IFI 14 September 2021	Additional projects to consider in the CEA are the Arklow Flood Relief Scheme and Arklow Wastewater Treatment Plant projects.	These projects were scoped in under Section 9.4 of the EIAR, CEA 'other development' screening, however they are no longer screened in for fish and shellfish as a result of no effect-receptor pathway.

6.3 CEA impact screening

164. The first step in the CEA for fish, shellfish and turtle is the identification of which residual impacts assessed for the CWP Project alone have the potential for a cumulative impact with other development (described as 'impact screening'). This screening exercise is set out in **Table 6-2** below.
165. All potential impacts assessed in Chapter 9 Fish, Shellfish and Turtle Ecology are included in the CEA and no impacts were screened out of the CEA.

Table 6-2 Potential impacts scoped into the assessment

Impact	CWP Project alone residual effect	Potential for significant cumulative effect – screened into the CEA (Yes / No)
Construction		
Temporary habitat disturbance	Not significant	Yes
Noise and vibration	Not significant	Yes
Temporary disturbance of the seabed leading to increases in suspended sediment concentration (SSC) and associated deposition	Not significant	Yes
Collision with vessels	Not significant	Yes
Accidental pollution events	Not significant	Yes
Invasive non-native species	Not significant	Yes
Operation		
Long-term habitat loss	Not significant	Yes
Electromagnetic fields (EMF).	Not significant	Yes
Operational noise.	Not significant	Yes
Temporary disturbance of the seabed including associated increases in SSC and associated deposition.	Not significant	Yes
Collision with vessels.	Not significant	Yes
Accidental pollution events	Not significant	Yes
Invasive non-native species	Not significant	Yes
Decommissioning		
Temporary seabed habitat disturbance.	The detail and scope of the decommissioning works for the CWP Project will be determined by the relevant legislation and guidance at the time of decommissioning. Project alone impacts during the decommissioning phase of the CWP Project are assessed in Chapter 9 Fish, Shellfish and Turtle Ecology . It is anticipated that the impacts will be no greater than those identified for the construction phase, and therefore no separate assessment of cumulative impacts during the decommissioning phase is presented within this CEA.	
Noise and vibration		
Temporary disturbance of the seabed leading to increases in suspended sediment concentration (SSC) and associated deposition.		
Collision with vessels		
Accidental pollution events		
Invasive non-native species		

6.4 Stage 3: Information gathering and ‘other development’ screening

166. Stage 2 of the CEA is presented in **Appendix 1** of **Part 1** of the **CEA Report**. This exercise established a shortlist of other development for fish, shellfish and turtle ecology using set screening criteria.
167. The shortlist of other development screened into the CEA for fish, shellfish and turtle ecology at Stage 2 are listed below.
- Statkraft - North Irish Sea Array (OWF_04);
 - Dublin Port Company - MP2 Project (CA_16);
 - Drogheda Port Company - Maintenance dredging River Boyne, Drogheda (CA_68 / DAS_06);
 - Dublin Port Company - Dumping at Sea arising from capital dredging works under the MP2 Project (DAS_03);
 - Dublin Port Company - Dredging and Dumping at Sea arising from the Dublin Harbour Capital Dredging Project (DAS_19);
 - RWE – Dublin Array (OWF_02);
 - SSE Renewables – Arklow Bank Wind Park 2 (OWF_01);
 - Dublin Port Company - 3FM Project (CA_33);
 - Parkwind NV – Oriel (OWF_06);
 - EnBW and BP – Mona (OWF_08);
 - EnBW and BP – Morgan (OWF_15);
 - EnBW and BP – Awel-y-Mor (OWF_09);
 - Microsoft - SOBR1 subsea fibre optic cable (SC_03);
 - Microsoft - SOBR2 subsea fibre optic cable (SC_06);
 - MaresConnect Limited - MaresConnect Interconnector (SC_11);
 - Minister for Agriculture, Food and the Marine - Development at Howth Fishery Harbour Centre (dredging and reclamation works) (CA_11);
 - Sure Partners Limited - Arklow Bank Wind Park 2 O&M Facility (CA_30);
 - Irish Water - Greater Dublin Drainage Project (CA_45);
 - Drogheda Port Company - Maintenance dredging River Boyne, Drogheda (CA_68 / DAS_06);
 - Orsted & Isle of Man Government - Isle of Man (Moor Vannin) (OWF_18);
 - Cobra & Floatation Energy - Morecambe (OWF_19);
 - EDF Renewables UK and ESB - Celtic Seas Round 5 PDA1 (Gwynt Glas) (OWF_27);
 - North Channel Wind 2 – North Channel Wind 2 (OWF_29); and
 - North Channel Wind 1 – North Channel Wind 1 (OWF_35).
168. Information gathering (Stage 3 of the CEA) has enabled a further review of the other development shortlist for fish, shellfish and turtle ecology, including a more detailed consideration of the location, nature and scale of the development, the timing of construction and operation activities, the information available to inform a CEA and the likelihood of a significant effect.
169. This information has been used to screen the Stage 2 shortlist to establish a final list of other development for detailed assessment at Stage 4 of the CEA. The results of the exercise are presented in **Table 6-3** below.

Table 6-3 Summary of other development screened into the CEA for fish, shellfish and turtle ecology

Development	Distance from the array site (km)	Distance from the export cable corridor (km)	Tier	Included in the CEA (Yes/No)	Rationale
Ref: SUR_24 Project: Site investigation activities to inform the development of the North Irish Sea Array OWF Developer: Statkraft Planning Ref: LIC230001	62	41.7	1	Yes	Potential cumulative impact exists as development will have all the same impacts as CWP – screened in.
Ref: OWF_04 Project: North Irish Sea Array Developer: Statkraft Planning Ref: OA29N.319866	51.0	35.7	1	Yes	Potential cumulative impact exists as development will have similar impacts as CWP – screened in.
Ref: CA_16 Project: MP2 Project Developer: Dublin Port Company Planning Ref: PA29N.304888	25.1	4.2	1	Yes	Potential cumulative impact exists as development will have similar impacts as CWP – screened in.

Development	Distance from the array site (km)	Distance from the export cable corridor (km)	Tier	Included in the CEA (Yes/No)	Rationale
Ref: CA_68 / DAS_06 Project: Maintenance dredging River Boyne, Dogheda Developer: Drogheda Port Company Planning Ref: FS007028 and S0015-03	69.1	42.7	1	Yes	Potential cumulative impact exists as development will have similar impacts as CWP – screened in.
Ref: CA_40 / DAS_04 Project: Maintenance Dredging in Dublin Port Developer: Dublin Port Company Planning Ref: FS007132 and S0004-03	32.2	0.8	1	Yes	Potential cumulative impact exists as development will have similar impacts as CWP – screened in.
Ref: DAS_03 Project: Dumping at Sea arising from capital dredging works under the MP2 Project Developer: Dublin Port Company	23.2	3.7	1	Yes	Potential cumulative impact exists as development will have all the same impacts as CWP – screened in.

Development	Distance from the array site (km)	Distance from the export cable corridor (km)	Tier	Included in the CEA (Yes/No)	Rationale
Planning Ref: S0024-02					
Ref: DAS_19 Project: Dredging and Dumping at Sea arising from the Dublin Harbour Capital Dredging Project Developer: Dublin Port Company Planning Ref: S0033-01 and FS007164	23.2	3.7	1	Yes	Potential cumulative impact exists as development will have similar impacts as CWP – screened in.
Ref: OWF_02 Project: Dublin Array Developer: RWE Planning Ref: OA06D.321992	2.8	0	1	Yes	Potential cumulative impact exists as development will have similar impacts as CWP – screened in.
Ref: OWF_01 Project: Arklow Bank Wind Park 2 Developer: SSE Renewables Planning Ref: OA27.319864	9.3	17.6	1	Yes	Potential cumulative impact exists as development will have similar impacts as CWP – screened in.

Development	Distance from the array site (km)	Distance from the export cable corridor (km)	Tier	Included in the CEA (Yes/No)	Rationale
Ref: CA_33 Project: 3FM Project Developer: Dublin Port Company Planning Ref: PA29N.320250	31.3	0.6	1	Yes	Potential cumulative impact exists as development will have similar impacts as CWP – screened in.
Ref: OWF_06 Project: Oriel Developer: Parkwind NV Planning Ref: OA15.319799	83.9	61.6	1	Yes	Potential cumulative impact exists as development will have similar impacts as CWP – screened in.
Ref: OWF_08 Project: Mona Developer: EnBW and BP Planning Ref: N/A	125.1	128.7	1	Yes	Potential cumulative impact exists as development will have similar impacts as CWP – screened in.
Ref: OWF_15 Project: Morgan Developer: EnBW and BP Planning Ref: N/A	141.2	143.9	1	Yes	Potential cumulative impact exists as development will have similar impacts as CWP – screened in.
Ref: OWF_09 Project: Awel-y-Mor	129.4	133.3	1	Yes	Potential cumulative impact exists as development will have

Development	Distance from the array site (km)	Distance from the export cable corridor (km)	Tier	Included in the CEA (Yes/No)	Rationale
Developer: EnBW and BP Planning Ref: N/A					similar impacts as CWP – screened in.
Ref: SC_03 Project: SOBR1 subsea fibre optic cable Developer: Microsoft Planning Ref: N/A	27.0	1.1	3	Yes	Potential cumulative impact exists as development will have similar impacts as CWP – screened in.
Ref: SC_06 Project: SOBR2 subsea fibre optic cable Developer: Microsoft Planning Ref: N/A	35.0	10.9	3	Yes	Potential cumulative impact exists as development will have similar impacts as CWP – screened in.
Ref: SC_11 Project: MaresConnect Interconnector Developer: MaresConnect Limited Planning Ref: N/A	43.2	19.6	3	Yes	Potential cumulative impact exists as development will have similar impacts as CWP – screened in.
Ref: CA_11 Project: Development at Howth Fishery	22.4	8.0	1	Yes	Potential cumulative impact exists as development will have

Development	Distance from the array site (km)	Distance from the export cable corridor (km)	Tier	Included in the CEA (Yes/No)	Rationale
Harbour Centre (dredging and reclamation works) Developer: Minister for Agriculture, Food and the Marine Planning Ref: PL06F.314487					similar impacts as CWP – screened in.
Ref: CA_30 Project: Arklow Bank Wind Park 2 O&M Facility Developer: Sure Partners Limited Planning Ref: WCC 211316	30.8	33.1	1	Yes	Potential cumulative impact exists as development will have similar impacts as CWP – screened in.
Ref: CA_45 Project: Greater Dublin Drainage Project Developer: Irish Water Planning Ref: PL06F.314488	33.1	9.9	1	Yes	Potential cumulative impact exists as development will have similar impacts as CWP – screened in.
Ref: OWF_18 Project: Isle of Man (Moor Vannin)	154.2	156.7	1	Yes	Potential cumulative impact exists as development will have

Development	Distance from the array site (km)	Distance from the export cable corridor (km)	Tier	Included in the CEA (Yes/No)	Rationale
Developer: Orsted & Isle of Man Government Planning Ref: N/A					similar impacts as CWP – screened in.
Ref: OWF_19 Project: Morecambe Developer: Cobra & Flotation Energy Planning Ref: N/A	154.4	157.9	1	Yes	Potential cumulative impact exists as development will have similar impacts as CWP – screened in.
Ref: OWF_27 Project: Celtic Seas Round 5 PDA1 (Gwynt Glas) Developer: EDF Renewables UK and ESB Planning Ref: N/A	175.3	181.1	3	Yes	Potential cumulative impact exists as development will have similar impacts as CWP – screened in.
Ref: OWF_29 Project: North Channel Wind 2 Developer: North Channel Wind 2 Planning Ref: N/A	177.6	162.7	3	Yes	Potential cumulative impact exists as development will have similar impacts as CWP – screened in.
Ref: OWF_35	202.1	183.9	3	Yes	Potential cumulative impact exists as development will have

Development	Distance from the array site (km)	Distance from the export cable corridor (km)	Tier	Included in the CEA (Yes/No)	Rationale
Project: North Channel Wind 1 Developer: North Channel Wind 1 Planning Ref: N/A					similar impacts as CWP – screened in.

6.5 Stage 4: Assessment of cumulative effects

6.5.1 Construction Phase

Cumulative Impact 1: Temporary seabed habitat disturbance

170. As described in the impact assessment for the CWP Project alone, the effect of temporary habitat disturbance and loss has the potential to impact mobile fish species with overlapping spawning and nursery grounds in the area, mobile fish and turtle species without spawning or nursery grounds, and shellfish.
171. The cumulative temporary seabed habitat disturbance from all aforementioned projects has the potential to increase the overall temporary loss and disturbance to the habitats of the receptors in the Irish Sea.
172. The CWP Project offshore development area is approximately 168 km², with the area of temporary habitat loss / disturbance calculated at approximately 7.4 km², which is approximately 4.4 % of the offshore development area. This area impacts up to 0.52 % of the overlapping spawning and nursery ground (common sole; *Solea solea*), and the project-alone significance was determined to be **not significant**.
173. The following species with known spawning and nursery habitat do not have overlap with the CWP offshore development area and therefore have no potential for a cumulative impact:
 - Thornback ray (*Raja clavata*);
 - Spotted ray (*Raja montagui*); and
 - Sandeel (*Ammodytes sp.*).
174. Species with spawning and nursery habitat impacted by CWP are listed in **Table 6-3**, along with the other projects that may impact that habitat. Only other OWF developments have been included in the table as they will have similar impact scales; however, all screened in projects are considered with the CEA assessment.
175. The following specie(s), while overlapped by CWP, do not share an overlap with any other projects and therefore have no potential for a cumulative impact:
 - European sprat (*Sprattus sprattus*).

Table 6-4 Summary table of other developments that overlap spawning and nursery habitats that may form a cumulative effect with CWP Project

Species	Coull et al. (1998)				Ellis et al.(2012)				Irelands Marine Atlas	
	Spawning (High intensity)	Spawning (Low intensity)	Spawning (Undetermined intensity)	Nursery	Spawning (High intensity)	Spawning (Low intensity)	Spawning (Undetermined intensity)	Nursery	Spawn	Nursery
Norway lobster (Homarus Gammarus)	SC_11; SOBR2 ; and SOBR1		OWF_04 ; OWF_02 ; OWF_08 ; OWF_15 ; OWF_19; OWF_29; OWF_35; OWF_27; OWF_18; SC_11; SOBR2; and SOBR1	OWF_04; OWF_02; OWF_08; OWF_15; OWF_19; OWF_29; OWF_35; OWF_27; OWF_18; SC_11; SOBR2; and SOBR1					OWF_06	
Tope shark (Galeorhinus galeus)								OWF_04; OWF_02; OWF_01; OWF_06; OWF_08; OWF_15; OWF_09; CA_40 / DAS_04; CA_11; CA_33;		

Species	Coull et al. (1998)				Ellis et al.(2012)				Irelands Marine Atlas	
	Spawning (High intensity)	Spawning (Low intensity)	Spawning (Undetermined intensity)	Nursery	Spawning (High intensity)	Spawning (Low intensity)	Spawning (Undetermined intensity)	Nursery	Spawn	Nursery
								CA_45; CA_68 / DAS_06; CA_33; OWF_19; OWF_27; OWF_18; SC_11; SOBR2; and SOBR1		
Haddock (Melanogrammus aeglefinus)				OWF_02; OWF_04; OWF_06; OWF_15; CA_40 / DAS_04; CA_11; CA_33; CA_45; CA_68 / DAS_06; CA_33; CA_68 / DAS_06; OWF_18; SC_11; SOBR2;					OWF_04; OWF_02; OWF_06; CA_68 / DAS_06; SC_11; SOBR2; and SOBR1	OWF_02;O WF_04;OW F_06;CA_40 /DAS_04;CA _11; CA_33; CA_45; CA_68 / DAS_06; CA_33; CA_68 / DAS_06; SC_11; SOBR2; and SOBR1

Species	Coull et al. (1998)				Ellis et al.(2012)				Irelands Marine Atlas	
	Spawning (High intensity)	Spawning (Low intensity)	Spawning (Undetermined intensity)	Nursery	Spawning (High intensity)	Spawning (Low intensity)	Spawning (Undetermined intensity)	Nursery	Spawn	Nursery
				and SOBR1						
Whiting (Merlangius merlangus)	OWF_02; SOBR1	OWF_04; OWF_02; OWF_06; OWF_08; OWF_15; CA_68 / DAS_06; OWF_19; OWF_29; OWF_35; OWF_18; SC_11; SOBR2; and SOBR1		OWF_02; OWF_04; OWF_06; OWF_09; CA_40 / DAS_04; CA_11; CA_33; CA_45; CA_68 / DAS_06; CA_33; OWF_19; OWF_35; SC_11; SOBR2; and SOBR1		OWF_04; OWF_02; OWF_06; OWF_08; OWF_15; OWF_09; CA_40 / DAS_04; CA_11;CA_33; CA_45; CA_68 / DAS_06; CA_33; OWF_19; OWF_29; OWF_35; OWF_27; OWF_18; SC_11; SOBR2; and SOBR1	OWF_04; OWF_02; OWF_06; OWF_08; OWF_15; OWF_09; CA_40 / DAS_04; CA_11;CA_33; CA_45; CA_68 / DAS_06; CA_33; OWF_19; OWF_35; OWF_18; SC_11; SOBR2; SOBR1	OWF_01; OWF_08; OWF_15; OWF_29; OWF_35; OWF_27; OWF_18; SC_11; SOBR2; and SOBR1	OWF_02; OWF_04; OWF_06; OWF_08; OWF_15; OWF_09; CA_40 / DAS_04; CA_11;C A_33; CA_45; CA_68 / DAS_06; CA_33; OWF_19; OWF_27; OWF_18; SC_11; SOBR2; and SOBR1	OWF_06; CA_68 /DAS_06;O WF_27;OW F_18;SC_11 ;SOBR2; and SOBR1
European plaice (Pleuronectes)	CA_68 / DAS_06; CA_68 / DAS_06;	OWF_02; OWF_04; OWF_06;		OWF_06; OWF_09;	OWF_04; OWF_02; OWF_06; OWF_08;	OWF_04; OWF_02; OWF_06; OWF_08;		OWF_02; OWF_04; OWF_06; OWF_08;		

Species	Coull et al. (1998)				Ellis et al.(2012)				Irelands Marine Atlas	
	Spawning (High intensity)	Spawning (Low intensity)	Spawning (Undetermined intensity)	Nursery	Spawning (High intensity)	Spawning (Low intensity)	Spawning (Undetermined intensity)	Nursery	Spawn	Nursery
es platessa)	OWF_19; SC_11; and SOBR2	OWF_08; OWF_15; CA_40 / DAS_04; CA_11; CA_33; CA_45; CA_33; OWF_19; OWF_35; OWF_18; SC_11; SOBR2; and SOBR1		CA_45; CA_68 / DAS_06; CA_68 / DAS_06; SC_11; SOBR2; SOBR1	OWF_15; OWF_09; CA_40 / DAS_04; CA_11;CA_3 3; CA_45; CA_68 / DAS_06; CA_33; OWF_19; OWF_27; OWF_18; SC_11; SOBR2; and SOBR1	OWF_15; OWF_09; CA_68 / DAS_06; CA_68 / DAS_06; OWF_19; OWF_18; SC_11; SOBR2; and SOBR1		OWF_15; OWF_09; CA_40 / DAS_04; CA_11;CA_33; CA_45; CA_68 / DAS_06; CA_33; OWF_19; OWF_18; SC_11; SOBR2; and SOBR1		
Atlantic mackerel (<i>Scomber scombrus</i>)						OWF_04; OWF_02;O WF_06; OWF_08; OWF_15;O WF_09; CA_40 / DAS_04; CA_11; CA_33; CA_45;		OWF_06; OWF_08; OWF_15; CA_68 / DAS_06; CA_68 / DAS_06; OWF_19; OWF_29; OWF_35;		OWF_04; OWF_02; OWF_01; OWF_06; OWF_08; OWF_15; OWF_09; CA_40 / DAS_04; CA_11;

Species	Coull et al. (1998)				Ellis et al.(2012)				Irelands Marine Atlas	
	Spawning (High intensity)	Spawning (Low intensity)	Spawning (Undetermined intensity)	Nursery	Spawning (High intensity)	Spawning (Low intensity)	Spawning (Undetermined intensity)	Nursery	Spawn	Nursery
						CA_68 / DAS_06; CA_33; OWF_19; OWF_29; OWF_35;O WF_27; OWF_18; SC_11; SOBR2; andSOBR1		OWF_27; OWF_18; SC_11; SOBR2; and SOBR1		CA_33; CA_45; CA_33; CA_68 / DAS_06; OWF_19; OWF_29; OWF_35; OWF_27; OWF_18; SC_11; SOBR2; and SOBR1
Atlantic horse mackerel (<i>Trachurus trachurus</i>)						OWF_08; OWF_15;O WF_27; SC_11; SOBR2 and SOBR1				OWF_04; OWF_02; OWF_01; OWF_06; OWF_08; OWF_15; OWF_09; CA_40 / DAS_04; CA_11; CA_33; CA_45; CA_68 / DAS_06;

Species	Coull et al. (1998)				Ellis et al.(2012)				Irelands Marine Atlas	
	Spawning (High intensity)	Spawning (Low intensity)	Spawning (Undetermined intensity)	Nursery	Spawning (High intensity)	Spawning (Low intensity)	Spawning (Undetermined intensity)	Nursery	Spawn	Nursery
										CA_33; OWF_19; OWF_29; OWF_35; OWF_27; OWF_18; SC_11; SOBR2; and SOBR1
Lemon sole (Microstomus kitt)			CA_40 / DAS_04; CA_11; CA_33; CA_45; CA_68 / DAS_06; CA_33; C OWF_18; SC_11; SOBR2; and SOBR1	OWF_04; OWF_02;O WF_01; OWF_06;O WF_08; OWF_15; CA_40 / DAS_04; CA_11; CA_33; CA_45; CA_68 / DAS_06; CA_33; OWF_18; SC_11; SOBR2; and SOBR1						

Species	Coull et al. (1998)				Ellis et al.(2012)				Irelands Marine Atlas	
	Spawning (High intensity)	Spawning (Low intensity)	Spawning (Undetermined intensity)	Nursery	Spawning (High intensity)	Spawning (Low intensity)	Spawning (Undetermined intensity)	Nursery	Spawn	Nursery
Common sole (<i>Solea solea</i>)	SC_11 and SOBR2	OWF_06; OWF_08; OWF_15; CA_40 / DAS_04; CA_33; CA_45; CA_33; CA_68 / DAS_06; OWF_19; OWF_18; SC_11; SOBR2; and SOBR1	OWF_27	SC_11 and SOBR2	OWF_08; OWF_15; OWF_09; OWF_19; OWF_27; OWF_18; SC_11; and SOBR2	OWF_06; OWF_08; OWF_15; CA_40 / DAS_04; CA_11; CA_33; CA_45; CA_68 / DAS_06; CA_33; OWF_27; OWF_18; SC_11; SOBR2; and SOBR1	OWF_08; OWF_15; OWF_09; OWF_19; SC_11; and SOBR2	OWF_15 and OWF_18		
Atlantic cod (<i>Gadus morhua</i>)	OWF_02 and SOBR1	OWF_04; OWF_02; OWF_06; OWF_08; OWF_15; CA_11; CA_33; CA_68 / DAS_06; OWF_19; OWF_18; SC_11;		OWF_04; OWF_02; OWF_06; CA_45; CA_68 / DAS_06; CA_33; CA_68 / DAS_06; SC_11; SOBR2;	OWF_08; OWF_15; OWF_09; CA_68 / DAS_06; CA_68 / DAS_06; OWF_19; OWF_27; OWF_18; SC_11; and SOBR2	OWF_04; OWF_02; OWF_06; OWF_08; OWF_15; CA_40 / DAS_04; CA_11; CA_33; CA_45; CA_33; CA_68 /	OWF_04; OWF_02; OWF_06; OWF_08; OWF_15; OWF_09; CA_40 / DAS_04; CA_11; CA_33; CA_45; CA_33;	OWF_01; OWF_08; OWF_15; OWF_29; OWF_35; OWF_18; SC_11; SOBR2; and SOBR1	OWF_02; OWF_04; OWF_06; OWF_08; OWF_09; CA_40 / DAS_04; CA_11; CA_33; CA_45; CA_68 / DAS_06;	OWF_04; OWF_02; OWF_01; OWF_06; OWF_08; OWF_15; OWF_09; CA_40 / DAS_04; CA_11; CA_33; CA_45;

Species	Coull et al. (1998)				Ellis et al.(2012)				Irelands Marine Atlas	
	Spawning (High intensity)	Spawning (Low intensity)	Spawning (Undetermined intensity)	Nursery	Spawning (High intensity)	Spawning (Low intensity)	Spawning (Undetermined intensity)	Nursery	Spawn	Nursery
		SOBR2; and SOBR1		and SOBR1		DAS_06; OWF_19; OWF_29; OWF_35; SC_11; SOBR2; and SOBR1	CA_68 / DAS_06; OWF_19; OWF_35; OWF_18; SC_11; SOBR2; and SOBR1		CA_33; OWF_19; OWF_18; SC_11; SOBR2; and SOBR1	CA_68 / DAS_06; CA_33; OWF_19; OWF_29; OWF_35; OWF_18; SC_11; SOBR2; and SOBR1
Anglerfish (<i>Lophius piscatorius</i>)								OWF_04; OWF_02; OWF_01; OWF_06; OWF_08; OWF_15; OWF_09; CA_40 / DAS_04; CA_11; CA_33; CA_45; CA_68 / DAS_06; CA_33; OWF_19; OWF_29; OWF_35; OWF_27;		

Species	Coull et al. (1998)				Ellis et al.(2012)				Irelands Marine Atlas	
	Spawning (High intensity)	Spawning (Low intensity)	Spawning (Undetermined intensity)	Nursery	Spawning (High intensity)	Spawning (Low intensity)	Spawning (Undetermined intensity)	Nursery	Spawn	Nursery
								OWF_18; SC_11; SOBR2; and SOBR1		
Ling (<i>Molva molva</i>)						OWF_04; OWF_02; OWF_06; OWF_08; OWF_15; CA_40 / DAS_04; CA_11; CA_33; CA_45; CA_68 / DAS_06; CA_33; OWF_19; OWF_29; OWF_35; OWF_27; OWF_18; SC_11; SOBR2; and SOBR1				
Spotted ray								CA_40 / DAS_04;		

Species	Coull et al. (1998)				Ellis et al.(2012)				Irelands Marine Atlas	
	Spawning (High intensity)	Spawning (Low intensity)	Spawning (Undetermined intensity)	Nursery	Spawning (High intensity)	Spawning (Low intensity)	Spawning (Undetermined intensity)	Nursery	Spawn	Nursery
								CA_11; CA_33; CA_45; CA_68 / DAS_06; CA_33; CA_68 / DAS_06; OWF_19; OWF_18; SC_11; SOBR2; SOBR1		
Sprat (<i>sprattus sprattus</i>)			CA_40 / DAS_04; CA_11; CA_33; CA_45; CA_68 / DAS_06; CA_33; ; OWF_19; OWF_29; OWF_35; OWF_27; OWF_18; SC_11; SOBR2; and SOBR1							

Species	Coull et al. (1998)				Ellis et al.(2012)				Irelands Marine Atlas	
	Spawning (High intensity)	Spawning (Low intensity)	Spawning (Undetermined intensity)	Nursery	Spawning (High intensity)	Spawning (Low intensity)	Spawning (Undetermined intensity)	Nursery	Spawn	Nursery
Thornack ray								CA_40 / DAS_04; CA_11; CA_33; CA_45; CA_68 / DAS_06; CA_33; OWF_19; OWF_27; OWF_18; SC_11; SOBR2; and SOBR1		

176. The proportion of habitat affected by this impact of the CWP Project is expected to be representative of the other developments occurring in the area. This is particularly true for the other offshore wind developments which are the most likely screened-in projects to have interaction with offshore spawning and nursery areas, given that offshore wind farms are likely to be on a similar scale and have the same impacts (i.e., noise, habitat loss).
177. Coastal projects, including harbour developments, are less likely to impact spawning areas as these are typically located away from the coastline, and are not typically located within port or harbour areas. The temporary habitat loss or disturbance is a discrete impact that occurs over a relatively small spatial extent compared to the wider area over which all the developments are present, and, as such, the impact is considered negligible in the context of the wider availability of suitable habitat for all species.
178. Subsea cable projects have the potential to impact the habitat and spawning areas of fish and shellfish species and prey due to the dredging and trenching of the seabed in order to install the cable.. However, the predominantly temporary habitat loss or disturbance is a discrete impact occurring over a very small area, compared to the wider availability of existing habitat. The impact is, therefore, defined as negligible in the context of wider availability of habitat for all species.
179. While the absolute area of affected habitat does increase when all other projects are considered, when considered proportionally to the areas of impact to the existing environment for each project, the magnitude does not increase.
180. For the CWP project cumulative impact with all other projects it is concluded that the magnitude of the impact will not be increased by the surrounding developments and that the cumulative effect of temporary habitat loss or disturbance will be **not significant**.

Cumulative Impact 2: Noise and vibration

181. As described in the impact assessment for the CWP Project alone, the effect of noise and vibration arising from construction-related activities, including piling, general construction noise and geophysical surveys, has the potential to impact all fish, turtles and shellfish (including eggs and larvae).
182. To mitigate potential impacts from underwater noise during the construction of the project, CWP commits to a limit on underwater noise of 169 dB $L_{E,p,ss,05}$ at 750 m at WTG and OSS piling events, and the implementation of noise abatement in the event high order UXO clearance is required. Piling works along the River Liffey Channel will not be permitted between March and May (inclusive) to avoid noise and vibration impact during the smolt run, which occurs in the river between these months.
183. The noise and vibration impacts from all the aforementioned projects have the potential to contribute to a cumulative impact on fish, turtles and shellfish in the Irish Sea, with the following effects associated with discrete thresholds: mortality, recoverable injury, and temporary threshold shift (TTS; Popper *et al.*, 2014). Key projects considered in the assessment of cumulative noise are, however, those that may include those activities that contribute to the greatest increases in underwater noise, notably impact piling or UXO clearance. This includes:
 - Dublin Array;
 - Arklow Bank Phase 2;
 - NISA Sea Array;
 - Oriel;
 - Mona;
 - Morgan;
 - Awel-y-Mor;
 - Dublin Port Company MP2 Project;
 - Morecambe;
 - North Channel Wind 2;

- North Channel Wind 1;
- Isle of Man (Moor Vannin); and
- 3FM Project.

184. Those developments that do not include impact piling or unexploded ordinance clearance (UXO) clearance (expected to be the dredging and site investigation-related projects), are not considered to contribute to the cumulative impact at a level that may increase the magnitude of the effect of underwater noise. This is because any noise from the activities will not propagate very far from the source as noise levels from these activities will not be as loud as those from UXO, for example. Additionally, coastal-related projects occur in shallow water and the sound will not travel as far. Site investigations that occur in deeper water will have a larger area of impact from sound, but the area of impact when considered with the wider availability of habitat, as well as mitigation put in place for marine mammals (such as ramp ups where applicable for equipment), is minimal.
185. The estimated distance over which each effect may act varies by hearing type and the associated thresholds. For the CWP Project, mortality represents the smallest area of impact, affecting receptors out to a distance of 0.86 km from piling for the most sensitive receptor. This impact distance, however, assumes no fleeing response in the receptors, which is considered highly precautionary. When fleeing receptors are considered, the distance from source over which mortal effects may be observed decreases to <50 m for the most noise-sensitive receptors.
186. When considered against overlapping spawning and nursery habitats, the largest mortality impact affects 0.05 % of haddock (*Melanogrammus aeglefinus*) spawning habitat and 0.04 % of cod (*Gadus morhua*) nursery habitat. Mortality impact ranges from the other developments are likely to be similar to those from the CWP Project as installation techniques and equipment used are likely to be similar, because the other offshore wind projects are of a similar scale, in comparable areas and completing the same activities.
187. Recoverable injury impacts may affect receptors out to a distance of 1.6 km for piling for the most sensitive receptor. This impact distance, however, assumes no fleeing response in the receptors, which is considered highly precautionary. When fleeing receptors are considered, the distance from source over which injury effects may be observed decreases to <50 m for the most noise-sensitive receptors.
188. When considered against overlapping spawning and nursery habitats, the largest injury impact affects 0.38 % of haddock spawning habitat and 0.12 % cod spawning habitat. Recoverable injury impacts from the other developments are likely to be similar to those from the CWP Project, because the other offshore wind projects are of a similar scale, in comparable areas and completing the same activities.
189. TTS represents the largest level of impact, affecting receptors out to a distance of 13 km for piling for the most sensitive receptor. This impact distance, however, assumes no fleeing response in the receptors, which is considered highly precautionary. When fleeing receptors are considered, the distance from source over which TTS effects may be observed decreases to 2.3 km for the most noise-sensitive receptors.
190. When considered against overlapping spawning and nursery habitats, the largest TTS impact affects 10.62 % of haddock spawning habitat and 3.99 % of haddock nursery habitat. TTS impacts from the other developments are likely to be similar to those from the CWP Project, because the other offshore wind projects are of a similar scale, in comparable areas and completing the same activities.
191. Piling is a temporary impact over the construction period. As such, although the percentage of overlap of a spawning area provides useful context, it does not take into account the short-term and temporary nature of the work compared to the duration of available spawning potential. As such, the proportion of spawning potential impacted has been calculated for the applicable species, with a maximum spawning potential impact of 0.98 % (haddock).
192. Effects were considered **not significant** for the CWP Project alone.

193. Considering the predicted impact ranges, not all developments will act additively at all thresholds. Mortality impacts are expected to act over relatively small spatial scales for all relevant developments, and therefore a limited effect is predicted across the cumulative projects considered. Given the wider availability of habitat in the area and short-term nature of the impact, the magnitude of this impact is not considered to increase due to the cumulative effects of all projects considered. While the absolute area of affected habitat does increase, when considered proportionally to the areas of impact to the existing environment for each project, the magnitude does not increase. Mitigation (e.g., soft start piling, or other mitigation designed to clear the immediate area of greatest impact) will be undertaken for the CWP Project and is expected to be implemented by all other developments considered within this cumulative assessment. This will provide an opportunity for all receptors to move out of the areas of potential mortality and further reduce the potential impacts. As such, the cumulative impact of mortality effects arising from underwater noise is considered to be **not significant**.
194. Recoverable injury and TTS affect receptors over much larger areas, and thus areas of effect arising from multiple projects have the potential to overlap. This may increase the areas over which these effects are experienced by receptors. Despite affecting receptors over a potentially large area, these effects are recoverable and temporary, allowing recovery of receptors on cessation of the impacting activities. Considering the temporary nature of the effect, with recoverability expected very quickly following cessation of the impacting activities, the magnitude of the impact is not considered to increase due to the cumulative effects of all projects considered. While the absolute area of affected habitat does increase, when considered proportionally to the areas of impact to the existing environment for each project, the magnitude does not increase. Additionally, projects will be conducting works throughout different times of the year; therefore, it is unlikely that piling events will affect the same spawning habitats at the same times and as such there will be limited chance of overlapping spawning potential reduction.
195. As such, the cumulative impact of recoverable injury or TTS effects arising from underwater noise is considered to be **not significant**.
196. For the CWP project cumulative impact with all other projects, it is concluded that the magnitude of the impact will not be increased by the surrounding developments and that the cumulative effect of noise and vibration related mortality, recoverable injury and TTS will be **not significant**.

Cumulative Impact 3: Temporary disturbance of the seabed leading to increases in Suspended Sediment Concentration (SSC) and associated deposition.

197. As described in the impact assessment for the CWP Project alone, the effect of temporary disturbance of the seabed leading to increases in SSC and associated deposition has the potential to impact mobile fish species with overlapping spawning and nursery grounds in the area, mobile fish species without spawning or nursery grounds in the area and shellfish.
198. The representative scenario is based upon the dredging / disposal and trenching works that will take place as part of the CWP Project. The greatest predicted impacts can be summarised as follows:

Dredging and dredge disposal

199. Suspended sediment plumes created during dredge disposal operations are predicted to enhance SSC levels in the near field (i.e., to the point of release) and far field (i.e., up to c. 7 km) from the point of release).
200. The predicted transport of sediment plumes and subsequent deposition during dredge disposal activities within the offshore development area can be summarised as follows:

201. Modelled representative scenarios of dredge disposal activities within the array site indicated the predominant direction of travel for SSC plumes is North-South / slight East. In one scenario, a maximum transient increase in SSC of 250 mg/L was predicted to travel a maximum of up to 7 km over c.11 days resulting in a cumulative sediment deposition thickness of c. 3 cm, near the disposal location. In another a maximum increase of 250 mg/L was predicted to travel up to 6 km over c. 11 days resulting in a cumulative sediment deposition thickness of c. 3 cm, near the disposal location. Modelled representative scenarios of dredge disposal activities within the OECC predicted: a maximum transient increase in SSC of 400 mg/L, travelling up to 6 km North-South / slight East resulting in a cumulative sediment deposition thickness of c. 4 cm, near the disposal location. In a final scenario, a maximum increase in SSC of 125 mg/L, travelling a maximum of 4 km North-South resulting in a cumulative sediment deposition thickness of c. 3 cm, near the disposal location.

Trenching

202. A consequence of cable installation will be the liberation of sediment into suspension within the water column, just above the seabed. Jetting results in greater sediment suspension, introducing the potential for distribution of greater volumes of material over a larger spatial area than other cable laying techniques which may be employed during construction and thus is assessed as the representative scenario. This method involves fluidising the material to form a narrow trench into which the cable is laid.
203. Based upon the representative scenario, the predicted transport of sediment plumes generated during cable installation activities across the array site indicates the finest sediments will potentially be transported North-South / slight East up to 6 km, over c. 11 days, at an increase of 80 mg/L, resulting in a cumulative sediment deposition thickness of c. 1 cm, near the release location. However, these plumes are transient, rapidly decreasing as sand sized sediments deposit to the bed and finer sediments are dispersed.
204. The predicted transport of sediment plumes generated during cable installation activities across the OECC were for a maximum increase in SSC of 140 mg/L being transported for up to 5 km North-South / slight East, over c. 12 days, resulting in a cumulative sediment deposition thickness of c. 1 cm, near the release location.
205. While suspended sediments have the potential to cover a moderate area, these effects are temporary, allowing recovery of receptors within days of impacting activities. Additionally, as most species are highly mobile (and less mobile species are considered to be tolerant of SSC), species will be able to move outside of the affected area. The predicted effect of the CWP Project alone is **not significant**.
206. The relevant projects include offshore wind farm developments, are subsea cables projects and dredging programmes. The impacts are likely to be relatively similar to those predicted for the CWP Project, because the projects are either of a similar scale, in comparable areas or completing the same activities. While the other projects (coastal developments and various surveys) have the potential to produce SSC, they will be on a significantly smaller scales when compared to the windfarm, cable and dredging activities. For CWP, it was concluded that the sediment thickness will be <1-3 cm within the immediate vicinity of trenching or dredge disposal activities, followed by rapid natural dispersal and sediment movement to reduce to background levels within 11-12 days. While for the purposes of the assessment it is assumed that all projects will occur simultaneously, it is highly unlikely that this will occur. However, the short duration of increased levels of SSC and rapid redistribution of sediments ensure there will not be change in the magnitude of the predicted impact from the cumulative impact of other developments. Additionally, given the distances among the projects and the lesser volume of material (in some cases; as per **Table 6-4**), the area over which the impacts occur is very large and the spread of the sediment is limited. While the absolute area of affected habitat does increase, when

considered proportionally to the areas of impact to the existing environment for each project, the magnitude does not increase.

207. The other projects will impact a much smaller area due to their nature (being coastally situated or survey related) and do not involve dredge disposal. While some of the activities will have the likelihood of increasing SSC, the combination of smaller areas and highly dynamic marine environments ensures there will not be a change in the magnitude of the predicted impact. While the absolute area of affected habitat does increase, when considered proportionally to the areas of impact on the existing environment for each project, the magnitude does not increase.
208. Considering the temporary nature of the effect, with recoverability expected very quickly following cessation of the impacting activities, the magnitude of the impact is not considered to increase due to the cumulative effects of all projects considered. While the absolute area of affected habitat does increase, when considered proportionally to the areas of impact on the existing environment for each project, the magnitude does not increase.
209. For the CWP project cumulative impact with all other projects, it is concluded that the magnitude of the impact will not be increased by the surrounding developments and that the cumulative effect of temporary disturbance of the seabed leading to increases in SSC and associated deposition will be **not significant**.

Cumulative Impact 4: Collision with Vessels

210. As described in the impact assessment for the CWP Project alone, the effect of collision with vessel events has the potential to impact two species: basking shark (*Cetorhinus maximus*) and leatherback turtle (*Dermochelys coriacea*).
211. It is highly likely that a proportion of vessels will be stationary or slow moving throughout construction activities for significant periods of time as a result of the nature of the construction activities, and where interaction with sensitive marine mammal and ornithology receptors is possible, measures will be introduced through the Ecological Vessel Management Plan (EVMP). This will minimise the risk of collisions through a reduction in the number of vessel routes, thereby minimising the area of potential overlap with receptors. In addition, the actual increase in vessel traffic moving around the site and to / from port to the site will occur over short periods of the offshore construction activity.
212. All vessels involved in the other projects will likely follow a vessel management plan, such as the one set up for CWP, which will outline transit routes and include information on marine mammals and other marine megafauna which may be in the area in order to minimise the risk of collisions. While the amount of vessel traffic does increase cumulatively with the other screened-in projects, when considered proportionally to the increased area over which the cumulative projects are based, the magnitude is not considered to increase. Based upon this, it is concluded that the predicted category of magnitude will not change due to the cumulative effect of the different developments.
213. For the CWP project cumulative impact with all other projects, it is concluded that the magnitude of the impact will not be increased by the surrounding developments and that the cumulative effect of temporary disturbance of collision with vessels will be not significant.

Cumulative Impact 5: Accidental Pollution Events

214. As described in the impact assessment for the CWP Project alone, construction vessels and equipment can result in pollution events from substances such as grease, hydraulic oil, gear oil, nitrogen, transformer silicon / ester oil, diesel fuel, SF6, glycol / coolants, batteries and drill fluid. All

such chemicals have the potential to cause harm to the aquatic environment; therefore, all species may be affected.

215. All vessels involved in the other projects will likely follow a Construction Environmental Management Plan (CEMP), such as the one set up for CWP, and will follow the Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR), International Marine Organisation (IMO) and International Convention for the Prevention of Pollution from Ships (MARPOL) guidelines, and industry best practices regarding pollution at sea. This includes provision for the storage of pollutants and identifies products suitable for use in the marine environment, rendering the occurrence of such an event highly unlikely. Based upon this, it is concluded that the predicted magnitude will not change due to the cumulative effect of the different developments.
216. For the CWP project cumulative impact with all other projects, it is concluded that the magnitude of the impact will not be increased by the surrounding developments and that the cumulative effect of accidental pollution events will be **not significant**.

Cumulative Impact 6: Invasive Non-Native Species

217. As described in the impact assessment for the CWP Project alone, there is the potential that INNS could be introduced by construction-related activities, through methods such as the release of contaminated ship's ballast. Once introduced to the environment, INNS can quickly outcompete other species for resources, resulting in species decline, and therefore all species may be affected.
218. All vessels involved in the other projects will consider the mitigation and control of invasive species measures in accordance with European Regulations and line with IMO guidance (IMO, 2019), and through the implementation of an offshore biosecurity plan. The associated standards and procedures will be incorporated by all vessels, rendering the occurrence of such an event highly unlikely. Based upon this, it is concluded that the predicted magnitude will not change due to the cumulative effect of the different developments.
219. For the CWP project cumulative impact with all other projects, it is concluded that the magnitude of the impact will not be increased by the surrounding developments and that the cumulative effect of INNS will be **not significant**.

6.5.2 Operation and maintenance

Cumulative Impact 1: Long-term habitat loss

220. As described in the impact assessment for the CWP Project alone, the effect of habitat disturbance and long-term loss has the potential to impact mobile fish species with overlapping spawning and nursery grounds in the area, mobile fish species without spawning or nursery grounds in the area and shellfish.
221. The CWP Project offshore development area is approximately 168 km², with the area of long-term habitat loss / disturbance calculated at approximately 0.6 km², which is approximately 0.4 % of the project offshore development area. This area overlaps, at most approximately 0.01 % of the spawning and nursery grounds of all species, and the project-alone significance was determined to be not significant.
222. Species established with both unaffected and cumulative impact potential under Cumulative Impact 1 remain the same for this impact.

223. The proportion of habitat affected by this impact by the CWP Project is expected to be representative of the other developments occurring in the area, particularly the other offshore wind developments, which are the most likely of those screened in to have interaction with offshore spawning and nursery areas. Coastal projects, including harbour developments, are less likely to impact spawning or nursery areas as these are typically located away from the coastline, and are not typically located within port or harbour areas. Projects screened in for surveys will not cause any long-term habitat loss and will result in minimal disturbance due to the discrete nature of the survey. Habitat disturbance and long-term loss is a discrete impact that occurs over a relatively small spatial extent compared to the wider area over which all the developments are present, and, as such, the impact is considered negligible in the context of the wider availability of suitable habitat for all species. While the absolute area of affected habitat does increase, when considered proportionally to the areas of impact on the existing environment for each project, the magnitude does not increase. Therefore, it is concluded that the magnitude of the impact will not be increased by the surrounding developments and that the cumulative effect of habitat disturbance and long-term loss will be **not significant**.
224. For the CWP project cumulative impact with all other projects, it is concluded that the magnitude of the impact will not be increased by the surrounding developments and that the cumulative effect of habitat disturbance and long-term loss will be **not significant**.

Cumulative Impact 2: Electromagnetic fields (EMF) from cables

225. As described in the impact assessment for the CWP Project alone, the effect of EMF exposure has the potential to impact all fish, turtle and shellfish species. While some species are considered more sensitive to EMF than others, the magnitude of the impact for sensitive was assessed to be low, with the highest significance being Moderate / Slight, which is **not significant**.
226. There is approximately 145.8 km of offshore export cable corridor (OECC) cable, 8.6 km of inter-connector cable and 139 km of inter-array cabling for the CWP Project, all of which has the potential to generate EMF. This is likely to be representative of the other windfarm developments.
227. There is also one subsea cable project that is expected to be operational at the same time as CWP, which has the potential to generate EMF.
228. As the coastal or survey-related projects are not power-generating developments, there will be no associated EMF for any of these projects, and as such they will not contribute to the cumulative impact.
229. The presence of EMF 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).
230. A study commissioned by the Marine Management Organisation (MMO) (2014) evaluated the results of environmental data associated with post-consent monitoring of licence conditions of UK Round 1 and Round 2 OWFs, and some European sites. The report concluded that from the results of post-consent monitoring conducted to date, there is no evidence to suggest that EMF pose a significant risk to elasmobranchs at a site or population level, and little uncertainty remains (MMO, 2014). In a study on the elasmobranch response to EMF, it was determined that while elasmobranch species did respond to the presence of EMF from a sub-sea cable, species remained present in the vicinity of the cable regardless of EMF presence (Gill et al., 2009).
231. In addition, the NPS EN-3 Renewable Energy Infrastructure (2001) and MMO (2014) both conclude that effects from EMF are not predicted to be significant for fish. No behavioural or physiological changes have been observed in shellfish below exposure levels of 200 μ T (Scott et al., 2020), a value far higher than the predicted maximum arising from the CWP project. Additionally, the earth's magnetic field is typically between 22 μ T and 67 μ T (British Geological Survey, n. d.). The maximum level (4.9 μ T) is well below the background levels that all the receptors experience. Any effects on fish and turtle are anticipated to only occur within the immediate vicinity of the cable. While the overall area covered

by EMF-producing cables between the windfarms will be large, assuming approximately the same lengths of cables, the effects of EMF occur over a small spatial scale when considered against the very large areas between projects. Given the low predicted levels, the burial of cables which will reduce EMF received by the receptors, and the expectation that equivalent levels of effect will be present at all other relevant developments, it is considered that there will be no meaningful change to the magnitude of effects at a cumulative level from EMF on fish, shellfish and turtle, which is considered to be very low. Therefore, it is concluded that the magnitude of the impact will not be increased by the surrounding developments and that the cumulative effect of EMF will be **not significant**.

232. For the CWP project cumulative impact with all other projects, it is concluded that the magnitude of the impact will not be increased by the surrounding developments and that the cumulative effect of EMF will be **not significant**.

Cumulative Impact 3: Operational noise

233. Projects likely to have levels of operational noise include the OWFs, dredging projects, vessel infrastructure-related projects (such as MP2 jetty development) and survey-related projects.
234. As described in the impact assessment for the CWP Project alone, the effect of noise and vibration has the potential to impact all fish, shellfish and turtles (including eggs and larvae) based on their hearing mechanisms. Unlike construction-related noise and vibration, no percussive piling or UXO clearance is occurring during this phase, hence the magnitude of effects are much reduced from that described during construction. The noise and vibration impact pathways are likely to include noise from vessels, noise from the operation of the turbines and geophysical survey noise.
235. In regard to vessel noise, it is already established that the CWP offshore development area contains a busy shipping route in and out of Dublin port; therefore, it is unlikely that operation / maintenance-related vessels for all projects will materially alter the level of vessel-related noise in the environment.
236. The operation of the wind turbine itself will produce noise; however, it has been established that turbines can act as fish-aggregating devices, offering new structures that can be used as habitats (Wilhelmsson, Malm and Öhman, 2006; Haberlin, Cohuo and Doyle, 2022). This indicates that the noise produced is such that fish are not affected and do not avoid the project infrastructure due to noise emissions.
237. The use of geophysical survey equipment is a common activity, with most vessels running some form of similar equipment (shipping / fishery). There is no evidence to suggest that geophysical survey noise affects fish or shellfish. As the survey equipment will be used on site-related infrastructure, the area affected will be restricted to this infrastructure, which is a minimal area within the general habitat. Additionally, such surveys will be of short duration. All use of this equipment will follow methods for marine mammals (see **Chapter 11 Marine Mammals**), which have inbuilt mitigation that will also mitigate the impacts on basking shark / turtle.
238. Based on the current literature to date, there is no evidence of mortality or population effects (such as reduced abundances) of fish or invertebrates following exposure to anthropogenic sound sources, such as those typical of survey work. Research on invertebrates provides evidence for low-frequency sound detection abilities, which may result in short-term behavioural responses in a number of marine invertebrate species (Roberts and Breithaupt, 2016; Carroll et al., 2017). In activities such as seismic surveys (not required for this site) that produce larger levels of generated noise, fish and shellfish will display physical responses, behavioural responses, and physiological responses. Physical responses include the potential of damage to hearing capabilities for fish, behavioural responses include startle behaviours (but no avoidance behaviour) and physiological responses include endocrinological stress (Carroll et al., 2017). While the predicted impacts from geophysical surveys are likely to be similar, the

sound levels will be to a less than seismic, and, as such, responses displayed by receptors will occur to a lesser extent.

239. In regard to general maintenance noise, activities will occur at undetermined but likely sporadic intervals (days / weeks) across the 25-year operation period. Activities may occur more than once in any given area, although their frequency will likely be infrequent. As none of the general maintenance activities involve a percussive impact, the magnitude of noise will be significantly less than from construction. There is the potential that generated noise will result in short-term behavioural responses (i.e., fleeing the area), but this will occur over very small areas within the CWP offshore development area and will be temporary.
240. Due to the above factors, the magnitude of impact is considered very low and the impact is Slight / Not significant. Determining the cumulative effect of noise and vibration is difficult; each development will cover different areas that may have different species and different areas of spawning and nursery grounds.
241. As the other windfarm projects will be producing similar levels of operational noise, it is unlikely that this will have a cumulative effect as it occurs over such a small spatial extent that the impact is negligible considering the wider availability of suitable habitat. While the absolute area of affected habitat does increase, when considered proportionally to the areas of impact on the existing environment for each project, the magnitude does not increase. Therefore, it is concluded that the magnitude of the impact will not be meaningfully increased by the surrounding developments and that no significant effect will come from operational noise.
242. For the CWP project cumulative impact with all other projects, it is concluded that the magnitude of the impact will not be increased by the surrounding developments and that the cumulative effect of operational noise will be **not significant**.

Cumulative Impact 4: Temporary disturbance of the seabed including associated increases in SSC and deposition

243. As described in the impact assessment for the CWP Project alone, the effect of temporary disturbance of the seabed, leading to increases in SSC and associated deposition, has the potential to impact mobile fish species with overlapping spawning and nursery grounds in the area, mobile fish species without spawning or nursery grounds in the area and shellfish.
244. As this will be an 'as needed' activity, it is difficult to predict the levels of SSC that may come from such activities; however, it will be significantly less than that of construction as no dredging will occur during the operational phase (and similarly for the other windfarms projects).
245. For species with spawning and nursery habitat, the potential overlap of spawning or nursery areas is negligible. While suspended sediments have the potential to cover a moderate area, these effects are temporary, allowing recovery of receptors within days of impacting activities. Additionally, as most species are highly mobile (and less mobile species are considered to be tolerant of SSC), species will be able to move outside of the affected area. Considering the temporary nature of the effect, with recoverability expected very quickly following cessation of the impacting activities, the magnitude of the impact is not considered to increase meaningfully as a result of the cumulative effects of all projects considered. While the absolute area of affected habitat does increase, when considered proportionally to the areas of impact on the existing environment for each project, the magnitude does not increase. As such, the cumulative impact of temporary disturbance of the seabed leading to increases in SSC and associated deposition is considered to be slight, which is **not significant**.
246. The relevant projects include the offshore windfarms and dredging programmes. Therefore, the impacts are likely to be relatively similar to those predicted for the CWP Project. In the construction component, it was concluded that the sediment thickness will be <1 cm within the immediate vicinity,

followed by rapid natural dispersal and sediment movement to reduce to background levels within 15 days. Any disturbance resulting in SSC is likely to be less significant than a dredging scenario. In addition to this, as it is highly unlikely that these impacts will be occurring within the exact same time period, the rapid settling of SSC and dispersal of sediments mean there will be no change in the magnitude of the predicted impact.

247. The other projects, the coastal and survey-related projects, will impact a much smaller area due to their nature and do not involve dredge disposal. While activities will have the likelihood of increasing SSC, the combination of smaller areas and highly dynamic marine environments means there will not be a meaningful change in the magnitude of the predicted impact. While the absolute area of affected habitat does increase, when considered proportionally to the areas of impact on the existing environment for each project, the magnitude does not increase.
248. For the CWP project cumulative impact with all other projects, it is concluded that the magnitude of the impact will not be increased by the surrounding developments and that the cumulative effect of temporary disturbance of the seabed leading to increases in SSC and associated deposition will be **not significant**.

Cumulative Impact 5: Collision with vessels

249. As described in the impact assessment for the CWP Project alone, the effect of collision with vessel events has the potential to impact two species: basking shark and leatherback turtle.
250. It is highly likely that a proportion of vessels will be stationary or slow moving throughout construction activities for significant periods of time as a result of measures introduced through the EVMP. This will minimise the risk of collisions through reduction in the number of vessel routes, thereby minimising the area of potential overlap with receptors. In addition, the operation and maintenance phase for all relevant projects will include significantly fewer vessels as fewer activities will be occurring during this time, further reducing the magnitude of impact.
251. All vessels involved in the other projects will likely follow a vessel management plan, such as the one set up for CWP, which will outline transit routes and include information on marine mammals and other marine megafauna which may be in the area in order to minimise the risk of collisions. While the absolute area of affected habitat does increase, when considered proportionally to the areas of impact on the existing environment for each project, the magnitude does not increase. Based upon this, it is concluded that the predicted magnitude will not change due to the cumulative effect of the different developments.
252. For the CWP project cumulative impact with all other projects, it is concluded that the magnitude of the impact will not be increased by the surrounding developments and that the cumulative effect of temporary disturbance of collision with vessels will be **not significant**.

Cumulative Impact 6: Accidental Pollution Events

253. As described in the impact assessment for the CWP Project alone, operation and maintenance vessels and equipment can result in pollution events from substances such as grease, hydraulic oil, gear oil, nitrogen, transformer silicon / ester oil, diesel fuel, SF6, glycol / coolants, batteries and drill fluid. All such chemicals have the potential to cause harm to the aquatic environment; therefore, all species may be affected.
254. All vessels involved in the other projects will likely follow an Operational Environmental Management Plan (OEMP), such as the CEMP produced for CWP which will be revised for the operational period, and will follow OSPAR, IMO and MARPOL guidelines, and industry best practices regarding pollution

at sea. This includes provision for the storage of pollutants and identifies products suitable for use in the marine environment, rendering the occurrence of such an event highly unlikely. Based upon this, it is concluded that the predicted magnitude will not meaningfully change due to the cumulative effect of the different developments. Additionally, as there are likely to be fewer vessel movements involved in the operational / maintenance phase, the magnitude is further reduced.

255. For the CWP project cumulative impact with all other projects, it is concluded that the magnitude of the impact will not be increased by the surrounding developments and that the cumulative effect of accidental pollution events will be **not significant**.

Cumulative Impact 7: Invasive Non-Native Species

256. As described in the impact assessment for the CWP Project alone, there is the potential that INNS could be introduced by construction-related activities, through methods such as the release of contaminated ship's ballast. Once introduced to the environment, INNS can quickly outcompete other species for resources, resulting in species decline, and therefore all species may be affected.
257. All vessels involved in the other projects will consider the mitigation and control of invasive species measures in line with European Regulations and International Maritime Organization guidance (IMO, 2019). The associated standards and procedures introduced by the implementation of the offshore biosecurity plan will be incorporated by all vessels, rendering the occurrence of such an event highly unlikely. Based upon this, it is concluded that the predicted magnitude will not meaningfully change due to the cumulative effect of the different developments. Additionally, as there are likely to be fewer vessel movements involved in the operational / maintenance phase, the magnitude is further reduced.
258. For the CWP project cumulative impact with all other projects, it is concluded that the magnitude of the impact will not be increased by the surrounding developments and that the cumulative effect of INNS will be **not significant**.

6.6 CEA summary

259. This CEA, which supports EIAR **Volume 3, Chapter 9 Fish, Shellfish and Turtle Ecology** has assessed the potential cumulative effects on Subtidal and Intertidal Ecology from the construction and operation and maintenance phases of the CWP Project alongside other development.
260. **Table 6-5** summarising the potential adverse or beneficial cumulative effects of the CWP Project with other development. It summarises the outcomes of the detailed assessment provided above and sets out the proposed mitigation measures needed to address cumulative effects, if deemed necessary.
261. In summary, the CEA for Fish, Shellfish and Turtle Ecology does not identify any significant cumulative effects resulting from the CWP Project alongside other development.

Table 6-5 CEA Summary

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
Construction phase				
Cumulative Impact 1: Temporary seabed habitat				
SC_11, CA_16, CA_11, CA_30, CA_45, CA_68/DAS_06, CA_40/DAS_04, CA_30, CA_33, CA_45, OWF_01, OWF_02, OWF_06, OWF_08, OWF_15 OWF_09, OWF_18, OWF_19, OWF_27, OWF_29, OWF_35	1 and 3	Not significant	N/A	Imperceptible to Slight / Not significant (not significant)
Cumulative Impact 2: Noise and vibration				
SUR_24, OWF_04, OWF_02, OWF_01, OWF_06,, OWF_08,OWF_15, OWF_09, OWF_18, OWF_19, OWF_27, OWF_29, OWF_35	1 and 3	Not significant	N/A	Imperceptible to Slight / Not significant (not significant)

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
Cumulative Impact 3: Temporary disturbance of the seabed leading to increase in SSC and associated deposition				
CA_68/DAS_06, CA_40/DAS_04, DAS_03, DAS_19, OWF_01, OWF_02, OWF_06, OWF_08, OWF_15, OWF_09, OWF_18, OWF_19, OWF_27, OWF_29, OWF_35, SC_11	1 and 3	Not significant	N/A	Not significant to slight (not significant)
Cumulative Impact 4: Collision with Vessels				
SC_11, SC_03, SC_06, CA_16, CA_11, CA_30, CA_45, CA_68/DAS_06 CA_40/DAS_04, CA_30, CA_33, CA_45, OWF_01, OWF_02, OWF_06, OWF_08, OWF_15, OWF_09, OWF_18, OWF_19, OWF_27, OWF_29, OWF_35	1 and 3	Not significant	N/A	Slight (not significant)

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
Cumulative Impact 5: Accidental Pollution Events				
SC_11, SC_03, SC_06, CA_16, CA_11, CA_30, CA_45, CA_68/DAS_06, CA_40/DAS_04, CA_30, CA_33, CA_45, OWF_01, OWF_02, OWF_06, OWF_08, OWF_15, OWF_09, OWF_18, OWF_19, OWF_27, OWF_29m OWF_35	1 and 3	Not significant	N/A	Slight (not significant)
Cumulative Impact 6: Invasive Non-Native Species				
SC_11, SC_03, SC_06, CA_16, CA_11 CA_30, CA_45, CA_68/DAS_06, CA_40/DAS_04, CA_30, CA_33, CA_45, OWF_01, OWF_02, OWF_06, OWF_08, OWF_15, OWF_09, OWF_18, OWF_19, OWF_27, OWF_29, OWF_35	1 and 3	Not significant	N/A	Slight (not significant)

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
Operation and maintenance phase				
Cumulative Impact 1: Long-term habitat loss				
CA_16, CA_11, CA_30 CA_45, CA_68/DAS_06, CA_40/DAS_04, CA_30, CA_33, CA_45, OWF_01, OWF_02, OWF_06, OWF_08, OWF_15, OWF_09, OWF_18, OWF_19, OWF_27, OWF_29, OWF_35	1 and 3	Not significant	N/A	Imperceptible to Slight / Not significant (not significant)
Cumulative Impact 2: Electromagnetic Fields (EMFs) from cables				
OWF_01, OWF_02, OWF_06, OWF_08, OWF_15, OWF_09, OWF_18, OWF_19, OWF_27, OWF_29, OWF_35, SC_11	1 and 3	Not significant	N/A	Imperceptible to Slight / Not significant (not significant)
Cumulative Impact 3: Operational noise				
CA_16, CA_11, CA_30 CA_45, CA_68/DAS_06 CA_40/DAS_04, CA_30, CA_33, CA_45, OWF_01, OWF_02, OWF_06, OWF_08, OWF_15, OWF_09, OWF_18,	1 and 3	Not significant	N/A	Slight / Not significant (not significant)

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
OWF_19, OWF_27, OWF_29, OWF_35				
Cumulative Impact 4: Temporary disturbance of the seabed, including associated increases in SSC and deposition				
CA_68/DAS_06, CA_40/DAS_04, CA_30, CA_33, CA_45, OWF_01, OWF_02, OWF_06, OWF_08, OWF_15, OWF_09, OWF_18, OWF_19, OWF_27, OWF_29, OWF_35	1 and 3	Not significant	N/A	Slight / Not significant (not significant)
Cumulative Impact 5: Collision with vessels				
SC_11, SC_03, SC_06, CA_16, CA_11, CA_30 CA_45, CA_68/DAS_06, CA_40/DAS_04, CA_30, CA_33, CA_45, OWF_01, OWF_02, OWF_06, OWF_08, OWF_15, OWF_09, OWF_18, OWF_19, OWF_27, OWF_29, OWF_35	1 and 3	Not significant	N/A	Slight (not significant)
Cumulative Impact 6: Accidental pollution events				
CA_16, CA_11, CA_30 CA_45, CA_68/DAS_06, CA_40/DAS_04, CA_30, CA_33, CA_45, OWF_01	1 and 3	Not significant	N/A	Slight (not significant)

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
OWF_02, OWF_06, OWF_08, OWF_15, OWF_09, OWF_18, OWF_19, OWF_27, OWF_29, OWF_35				
Cumulative Impact 7: Invasive Non-Native Species				
CA_16, CA_11, CA_30 CA_45, CA_68/DAS_06, CA_40/DAS_04, CA_30, CA_33, CA_45, OWF_01, OWF_02, OWF_06, OWF_08, OWF_15, OWF_09, OWF_18, OWF_19, OWF_27, OWF_29, OWF_35	1 and 3	Not significant	N/A	Slight (not significant)

6.7 References

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7 OFFSHORE ORNITHOLOGY

7.1 Introduction

267. This section of the **CEA Report** presents the findings of the CEA for offshore ornithology, which considers the residual effects presented in **EIAR Volume 3, Chapter 10 Ornithology** alongside the potential effects of other proposed and reasonably foreseeable development. Cumulative effects are considered in this document across the construction and operation and maintenance phases of the CWP Project.
268. Updates to the project alone assessment for offshore ornithology as a consequence of ACPs FIR are presented in **Section 10** of the **EIAR Addendum**. This updated CEA incorporates relevant updates from the project alone assessment and has been updated in response to the requests made in item 5 of the FIR.

7.2 Consultation

269. **Table 7-1** provides a summary of stakeholder and regulator feedback received during the consultation process that is relevant to the CEA for offshore ornithology.

Table 7-1 Consultation responses relevant to the CEA for offshore ornithology

Consultee	Comment	How issues have been addressed
Scoping responses		
Department of Agriculture, Environment and Rural Affairs (DAERA) 23 February 2021	Retention of some concerns regarding collision risk mortality during non-breeding season, particularly during migration periods, which could also contribute to a wider cumulative risk in-combination with other Irish Sea projects. Chief concerns relate to terns, kittiwake (<i>Rissa tridactyla</i>) and lesser black-backed gull (<i>Larus fuscus</i>).	Collision Risk Modelling (CRM) has been carried out, with collision mortality being estimated during all months of the year. Further information on CRM carried out can be found in Appendix 10.3 Collision Risk Modelling . Cumulative collision impacts to kittiwake, great black-backed gull, herring gull, gannet and common tern are assessed here. Other tern species and lesser black-backed gull were screened out from CEA on the basis of project only collision impacts being imperceptible and non-significant in EIA terms.
Topic specific meetings		
National Parks and Wildlife Service (NPWS) 27 February 2020	For CEA advised using min / max scenarios, where min includes only consented projects, and max also includes projects that could	The methods used for the CEA are presented here. A tiered approach to incorporate cumulative scenarios in relation to

Consultee	Comment	How issues have been addressed
	be consented between assessment and works commencing.	consented and non-consented projects is followed.
Other		
Irish east coast Phase 1 projects (CWP, NISA, Dublin Array, Arklow Phase 2, Oriel) 13 October 2023	To facilitate the development of a consistent approach to be followed by Irish east coast Phase 1 projects to undertake CEA, an agreed list of regional OWF projects to be considered within CEA and their associated annual collision mortalities and peak abundances (to inform cumulative displacement assessment) was developed.	The agreed list formed the basis of OWF projects included in the CEA (see Section 7.4 , below)
FIR		
ACP 5 November 2025	No stakeholder or regulator feedback was received during the meeting that was relevant to the CEA for Ornithology	NA
NPWS 27 November 2025	No stakeholder or regulator feedback was received during the meeting that was relevant to the CEA for Ornithology	NA

7.3 CEA impact screening

270. The first step in the CEA for offshore ornithology is the identification of which residual impacts assessed for the CWP Project alone have the potential for a cumulative impact with other developments (described as 'impact screening'). This screening exercise is set out in **Table 7-2** below.
271. Only potential impacts assessed in **Volume 3, Chapter 10 Ornithology** or, where assessments have been redone during the FIR process, as assessed in **Section 10** of the **EIAR Addendum**, as 'not significant' or above are included in the CEA (i.e. those assessed as 'imperceptible' are not taken forward as there is no potential for them to contribute to a cumulative effect).

Table 7-2 CEA impact screening

Impact	Potential for cumulative effect	Rationale
Construction		
Impact 1 - Direct effects on offshore and intertidal habitats during construction phase activities.	Array site: No	Impacts extremely localised in relation to seabird offshore habitat use extents. Residual 'project only' impacts to all receptors assessed to be of imperceptible significance level.
	Offshore Export Cable Corridor (OECC) (Below MLWS): No	
	OECC (MLWS to MHWS): No	Intertidal impacts localised and short duration. Residual 'project only' impacts to all receptors assessed to be of imperceptible significance level.
Impact 2 - Disturbance and displacement to ornithological receptors in offshore and intertidal habitats during construction phase activities.	Array site: Indirect habitat loss and barrier effects to seabirds – Yes, for guillemot¹, razorbill¹, puffin¹, red-throated diver² and gannet¹. All other receptors screened out.	For all receptors, with the exception of those listed, 'project only' impacts are either screened out (on the basis of receptor insensitivity to the impact, or low receptor abundance within impacted areas), or residual impacts assessed to be of imperceptible significance level (on the basis of negligible impact magnitude). For guillemot, razorbill, puffin, red-throated diver and gannet residual project only impact significance levels are assessed to be not significant or greater and therefore further consideration of cumulative effects is required.
	Array site: Barrier effects to migrant species: No	Potential impact magnitude negligible for all receptors. Residual 'project only' impacts to all receptors assessed to be of imperceptible significance level.
	OECC (Below MLWS): Indirect habitat loss and barrier effects to seabirds – Yes for red-throated diver². All other receptors screened out.	For all receptors, with the exception of those listed, 'project only' impacts are either screened out (on the basis of receptor insensitivity to the impact, or low receptor abundance within impacted areas), or residual impacts assessed to be of imperceptible significance level (on the basis of negligible impact magnitude). For red-throated diver residual 'project only' impact significance levels are assessed to be not significant and therefore further consideration of cumulative effects is required.
	OECC (MLWS to MHWS): Yes, for the following receptors only redshank¹, Sterna terns¹ (common, Arctic and roseate) and sandwich tern	For all receptors, with the exception of those listed, 'project only' impacts are either screened out (on the basis of low receptor abundance within impacted areas), or residual impacts assessed to be of imperceptible significance level (on the basis of negligible impact magnitude). For redshank, Sterna terns (common, Arctic and roseate) and sandwich tern residual 'project only' impact significance levels are assessed to be slight or not significant and therefore further consideration of cumulative effects is required.
Impact 3 - Changes in prey availability for	Array site and OECC (Below MLWS): No	Potential impact magnitude negligible/low for all receptors. Residual 'project only' impacts to all receptors assessed to be of imperceptible significance level.

Impact	Potential for cumulative effect	Rationale
ornithological receptors in offshore and intertidal habitats from construction phase activities.	OECC (MLWS to MHWS): No	Intertidal impacts localised and short duration. Residual 'project only' impacts to all receptors assessed to be of imperceptible significance level.
Impact 4 - Accidental pollution in offshore and intertidal habitats during construction phase activities.	Array site, OECC (Below MLWS) and OECC (MLWS to MHWS): No	No impact after primary mitigation
Impact 5 - Accidental introduction or spread of invasive species in offshore and intertidal habitats during construction phase activities.	Array site, OECC (Below MLWS) and OECC (MLWS to MHWS): No	No impact after primary mitigation
Operation		
Impact 1 - Direct effects on offshore and intertidal habitats during the operational phase.	Array site: No	Potential impact magnitudes negligible for all receptors. Residual 'project only' impacts to all receptors assessed to be of imperceptible significance level.
	OECC (Below MLWS): No	
	OECC (MLWS to MHWS): No	
Impact 2 - Disturbance and displacement to ornithological receptors in offshore and intertidal habitats during operational phase activities.	Array site: Indirect habitat loss and barrier effects to seabirds – Yes, for guillemot¹, razorbill¹, puffin¹, red-throated diver² and gannet¹. All other receptors are screened out.	For all receptors, with the exception of those listed, 'project only' impacts are either screened out (on the basis of receptor insensitivity to the impact, or low receptor abundance within impacted areas), or residual impacts assessed to be of imperceptible significance level (on the basis of negligible impact magnitude). For guillemot, razorbill, puffin, red-throated diver and gannet residual 'project only' impact significance levels are assessed to be not significant or greater.
	Array site: Barrier effects to migrant species: No	Potential impact magnitudes negligible for all receptors. Residual project only impacts to all receptors assessed to be of imperceptible significance level.
	Array Site: Artificial lighting impacts to Manx shearwater: No	Potential impact magnitudes negligible for receptor. Residual project only impact to receptors assessed to be of imperceptible significance level.

Impact	Potential for cumulative effect	Rationale
	OECC (Below MLWS): Indirect habitat loss and barrier effects to seabirds – No	Potential impact magnitudes negligible for all receptors. Residual project only impacts to all receptors assessed to be of imperceptible significance level.
	OECC (MLWS to MHWS): No	
Impact 3 - Changes in prey availability for ornithological receptors in offshore and intertidal habitats during the operational phase.	Array site and OECC (Below MLWS): No	Potential impact magnitudes negligible for all receptors. Residual project only impacts to all receptors assessed to be of imperceptible significance level.
	OECC (MLWS to MHWS): No	
Impact 4 - Accidental pollution in offshore and intertidal habitats during operational phase activities.	Array site, OECC (Below MLWS) and OECC (MLWS to MHWS): No	No impact after primary mitigation
Impact 5 - Accidental introduction or spread of invasive species in offshore and intertidal habitats during operational phase activities.	Array site, OECC (Below MLWS) and OECC (MLWS to MHWS): No	No impact after primary mitigation
Impact 6 - For Array Site only. Collision with operational WTGs.	Array site: Yes, for kittiwake ¹ , great black-backed gull ¹ , herring gull ¹ , common tern ¹ and gannet ² . All other receptors screened out.	For all receptors, with the exception of those listed, 'project only' impacts are either screened out (on the basis of receptor insensitivity to the impact, or low receptor abundance within impacted areas), or residual impacts assessed to be of imperceptible significance level (on the basis of negligible impact magnitude). For kittiwake, great black-backed gull, herring gull, common tern and gannet residual project only impact significance levels are assessed to be not significant or greater.

Decommissioning

The detail and scope of the decommissioning works for the CWP Project will be determined by the relevant legislation and guidance at the time of decommissioning. Project alone impacts during the decommissioning phase of the CWP Project are assessed in Chapter 10 Ornithology. It is anticipated that the impacts will be no greater than those identified for the construction phase, and therefore no separate assessment of cumulative impacts during the decommissioning phase is presented within this CEA.

¹ Assessment of project-only impacts presented within **Volume 3, Chapter 10 Ornithology**.

² Assessment of project-only impacts presented within **Section 10 of the EIAR Addendum**.

272. In summary, **Table 7-2** above, shows that there is the potential for cumulative effects on:

- Guillemot, razorbill, puffin red-throated diver and gannet as a result of disturbance and displacement in the form of indirect habitat loss within the array site and surrounding area during the construction phase.
- Red-throated diver as a result of disturbance and displacement in the form of indirect habitat loss within the offshore part (<MLWS) of the OECC during the construction phase.
- Redshank, *Sterna* terns (common, Arctic and roseate) and sandwich tern as a result of disturbance and displacement in the form of indirect habitat loss within the intertidal part (MLWS to MHWS) of the OECC during the construction phase.
- Guillemot, razorbill, puffin, red-throated diver and gannet as a result of disturbance and displacement in the form of indirect habitat loss within the array site and surrounding area during the operation and maintenance phase.
- Kittiwake, great black-backed gull, herring gull, common tern and gannet as a result of collision within the array site during the operation and maintenance phase.

7.4 Stage 3: Information gathering and ‘other development’ screening

273. Stage 2 of the CEA is presented in **Appendix 1 of Part 1 of the CEA Report**. This exercise established a shortlist of other developments for Ornithology using set screening criteria.

274. Information gathering (Stage 3 of the CEA) has enabled a further review of the other developments shortlist for Ornithology, including a more detailed consideration of the location, nature and scale of the development, the timing of construction and operation activities, the information available to inform a CEA and the likelihood of a significant effect.

275. This information has been used to screen the Stage 2 shortlist to establish a final list of other development for detailed assessment at Stage 4 of the CEA. The results of the exercise are presented in **Table 7-3** (offshore ornithology) and **Table 7-4** (intertidal ornithology), below.

Table 7-3 Summary of other developments screened into the CEA for offshore ornithology

Development	Distance from Array Site (km)	Distance from OECC (km)	Tier	Included in the CEA? (Yes/No)	Rationale
Ref :OWF_02 Project: Dublin Array Developer: RWE	2.8	0	1	Yes	Projects within Zol, with potential impact-receptor-pathway and with temporal overlap.
Ref: OWF_01 Project :Arklow Bank Wind Park 2 Developer : SSE Renewables	9.3	9.9	1	Yes	
Ref: OWF_03 Project: Arklow Bank Wind Park 1 Developer: GE Energy	22.1	28.3	1	Yes	
Ref : OWF_04 Project : North Irish Sea Array Developer : Statkraft	51.0	35.7	1	Yes	
Ref : OWF_06 Project : Oriel Developer : Oriel Windfarm Limited , Parkwind NV, ESB	83.9	61.6	1	Yes	
Ref: OWF_08 Project: Mona Developer : EnBW and BP	125.1	128.7	1	Yes	
Ref : OWF_15 Project :Morgan Developer : EnBW and BP	140.12	143.9	1	Yes	

Development	Distance from Array Site (km)	Distance from OECC (km)	Tier	Included in the CEA? (Yes/No)	Rationale
Ref: OWF_09 Project : Awel y Môr Developer: RWE Renewables	129.4	133.3	1	Yes	
Ref : OWF_12 Project: Rhyl Flats Developer : RWE Npower	138.4	142.5	1	Yes	
Ref : OWF_13 Project : Gwynt y Mor Developer: RWE	140.3	144.2	1	Yes	
Ref: OWF_19 Project : Morecambe Developer : Cobra & Flotation Energy	154.4	157.9	1	Yes	
Ref: OWF_21 Project: Walney Extension 3 Developer : Ørsted	163.3	166.1	1	Yes	
Ref : OWF_22 Project : Walney Extension 4 Developer : Walney Extension Limited	165.9	168.8	1	Yes	
Ref: OWF_17 Project : North Hoyle Developer: Greencoat	153.2	157.2	1	Yes	
Ref: OWF_20 Project: Burbo Bank Extension	162.0	166.0	1	Yes	

Development	Distance from Array Site (km)	Distance from OECC (km)	Tier	Included in the CEA? (Yes/No)	Rationale
Developer: Ørsted					
Ref: OWF_25 Project : Walney 2 Developer: Ørsted	173.4	175.6	1	Yes	
Ref: OWF_26 Project : West of Duddon Sands Developer: Scottish Power Renewables & Ørsted	174.2	177.4	1	Yes	
Ref: OWF_28 Project : Walney 1 Developer: Ørsted	176.2	179.4	1	Yes	
Ref: OWF_24 Project : Burbo Bank Developer: Ørsted	171.6	175.6	1	Yes	
Ref:OWF_32 Project : Ormonde Developer: Vattenfall	184.5	187.6	1	Yes	
Ref : OWF_23 Project : Erebus Floating Wind Demo Developer: Simply Blue Energy & Total Energy	167.9	173.9	1	Yes	
Ref: OWF_33 Project : Barrow Developer: Ørsted	186.3	189.7	1	Yes	

Development	Distance from Array Site (km)	Distance from OECC (km)	Tier	Included in the CEA? (Yes/No)	Rationale
Ref: OWF_38 Project : Robin Rigg West Developer: Ørsted	222.1	221.6	1	Yes	
Ref : OWF_39 Project : Robin Rigg East Developer: Ørsted	224.7	224.0	1	Yes	
Ref : OWF_36 Project : White Cross Developer: White Cross Flotation Energy plc, COBRA INSTALACIONES Y SERVICIOS, S.A.	207.5	213.9	1	Yes	
Ref : OWF_42 Project : TwinHub Developer: Hexicon	291.3	297.3	1	Yes	
Ref : OWF_18 Project : Isle of Man (Mooir Vannin) Developer: Ørsted & Isle of Man Government	154.2	156.7	1	Yes	
Ref: OWF_30 Project : Llyr 1 Developer: Llyr 1 Cierco Ltd.,SBM Offshore N.V.	181.5	187.8	1	Yes	
Ref: OWF_29 Project : North Channel Wind 2	177.6	162.7	3	No	Data are not available

Development	Distance from Array Site (km)	Distance from OECC (km)	Tier	Included in the CEA? (Yes/No)	Rationale
Developer: North Channel Wind 2					
Ref: OWF_11 Project : Tonn Nua Developer: Unknown	135.7	141.3	3	No	
Ref: OWF_27 Project : Celtic Seas Round 5 PDA1 (Gwynt Glas) Developer: EDF Renewables UK and ESB	175.3	181.1	3	No	
Ref: OWF_34 Project : Celtic Seas Round 5 PDA2 Developer: Ocean Winds	198.6	204.5	3	No	
Ref: OWF_37 Project : Celtic Seas Round 5 PDA3 Developer: Equinor	219.4	225.6	3	No	
Ref: OWF_35 Project : North Channel Wind 1 Developer: North Channel Wind 1	202.1	183.9	3	No	
Ref: OWF_31 Project : Llyr 2 Developer: Llyr 2 Cierco Ltd.,SBM Offshore N.V.	183.8	190.4	3	No	
Ref: OWF_40 Project : Malin Sea Wind	259.5	234.4	3	No	

Development	Distance from Array Site (km)	Distance from OECC (km)	Tier	Included in the CEA? (Yes/No)	Rationale
Developer: ESB					
Ref : OWF_43 Project : Machair Developer: MachairWind SPR Ltd.	302.2	277.5	3	No	
Ref: OWF_44 Project : Teesside Developer: EDF Energy - Northern Offshore Windfarm Ltd	347.3	350.7	1	No	Although within the ZOI range of 509 km, there is considered to be no potential impact-receptor-pathway, as the 'by sea' distance (i.e., the distance a seabird would travel without crossing land) between projects is greater than 509 km.
Ref: OWF_46 Project : Blyth Demo Phase 1 Developer: EDF Energy Renewables	359.7	36.2.8	1	No	
Ref : OWF_47 Project : Blyth Demo Phase 2 (Floating) Developer: EDF Energy Renewables	365.1	368.1	1	No	
Ref: OWF_48 Project : Forthwind Developer: Cierco	379.8	373.2	1	No	
Ref: OWF_49 Project : Methil Demo/Levenmouth Developer: ORE Catapult Ltd	381.4	374.7	1	No	
Ref: OWF_52 Project : Neart Na Gaoithe Developer: Mainstream Renewable Power	409.8	406.0	1	No	

Development	Distance from Array Site (km)	Distance from OECC (km)	Tier	Included in the CEA? (Yes/No)	Rationale
Ref: OWF_50 Project : Westermost Rough Developer: Ørsted	393.3	397.3	1	No	
Ref: OWF_51 Project: Humber Gateway Developer: E.ON Humber Wind Ltd / Balfour Beatty Investments and Equitix.	401.6	405.7	1	No	
Ref: OWF_56 Project : Berwick Bank Developer: Scottish Southern Energy Renewables	426.1	424.8	1	No	
Ref: OWF_58 Project: Inch Cape Developer: Red Rock Power (ICOL)	430.6	425.9	1	No	
Ref: OWF_53 Project: Inner Dowsing Developer: XceCo	411.3	415.0	1	No	
Ref: OWF_54 Project : Lynn Developer: XceCo	411.3	414.9	1	No	
Ref : OWF_55 Project : Lincs Developer: Ørsted	412.5	416.2	1	No	
Ref: OWF_61	449.0	444.9	1	No	

Development	Distance from Array Site (km)	Distance from OECC (km)	Tier	Included in the CEA? (Yes/No)	Rationale
Project : Seagreen Phase 1 Developer: SSE / Seagreen Wind Energy Ltd					
Ref: OWF_57 Project: Triton Knoll Developer: Innogy	429.1	433.0	1	No	
Ref: OWF_59 Project: Race Bank Developer: Ørsted / Macquarie Group	433.8	437.8	1	No	
Ref: OWF_60 Project : Rampion 2 Developer: Rampion 2 OWF	439.2	446.2	1	No	
Ref: OWF_62 Project: Outer Dowsing Developer: Green Investment Group - Total	449.8	453.7	1	No	
Ref: OWF_64 Project : Sheringham Shoal Extension Developer: Equinor	451.5	455.2	1	No	
Ref: OWF_65 Project: Hornsea Project Four Developer: Ørsted	458.0	461.9	1	No	
Ref: OWF_297 Project: Sheringham Shoal	470.4	474.1	1	No	

Development	Distance from Array Site (km)	Distance from OECC (km)	Tier	Included in the CEA? (Yes/No)	Rationale
Developer: Statoil / Statkraft					
Ref: OWF_63 Project: Rampion Developer: E.ON UK	450.3	457.2	1	No	
Ref: OWF_66 Project: Dudgeon Extension Developer: Equinor	460.5	464.3	1	No	
Ref: OWF_67 Project: Dudgeon Developer: Statoil / Statkraft	470.4	474.1	1	No	
Ref: OWF_72 Project: Morven Developer: Morven BP E1	490.1	490.2	2	No	
Ref: OWF_79 Project: Kincardine Developer: Grupo Cobra	494.5	488.5	1	No	
Ref: OWF_76 Project: Dogger Bank South (West) Developer: RWE Renewables	492.4	496.2	1	No	
Ref: OWF_70 Project: Hornsea Project Two Developer: Ørsted	482.5	486.5	1	No	
Ref: OWF_81	502.4	498.1	2	No	

Development	Distance from Array Site (km)	Distance from OECC (km)	Tier	Included in the CEA? (Yes/No)	Rationale
Project: Bowdun Developer: Cluaran Deas Ear DEME E3					
Ref: OWF_68 Project: Parc éolien posé au large de la Normandie (AO4) Developer: Unknown	477.5	485.0	3	No	
Ref: OWF_86 Project: Aberdeen (EOWDC) Developer: Vattenfall	510.1	502.9	1	No	
Ref: OWF_69 Project : Centre-Manche 1 Developer: EDF and Maple Power	481.1	495.5	3	No	
Ref: OWF_85 Project: Ossian Developer: SSE Renewables-Marubeni-CIP E1	508.9	510.2	1	No	
Ref: OWF_80 Project: Hornsea Project One Developer: Ørsted	495.5	499.6	1	No	
Ref: OWF_73 Project: Gunfleet Sands I Developer: Ørsted	490.9	496.1	1	No	
Ref: OWF_74 Project: Gunfleet Sands Demo	491.3	496.6	1	No	

Development	Distance from Array Site (km)	Distance from OECC (km)	Tier	Included in the CEA? (Yes/No)	Rationale
Developer: Ørsted					
Ref: OWF_71 Project: Centre-Manche 2 Developer: TotalEnergies / RWE	488.1	45.5	3	No	
Ref: OWF_77 Project: Gunfleet Sands II Developer: Ørsted	492.4	496.2	1	No	
Ref: OWF_75 Project : Kentish Flats Extension Developer : Vattenfall	491.9	497.5	1	No	
Ref : OWF_78 Project: Kentish Flats Developer: Vattenfall	493.1	498.7	1	No	
Ref :OWF_83 Project : Scroby Sands Developer : E.ON UK	506.1	509.8	1	No	
Ref: OWF_84 Project: London Array Developer: Siemens Gamesa Renewable Energy	508.9	514.1	1	No	
Ref: SC_11 Project: MaresConnect Interconnector Developer: MaresConnect Limited Planning Ref: N/A	43.2	19.6	3	No	Data are not available

Development	Distance from Array Site (km)	Distance from OECC (km)	Tier	Included in the CEA? (Yes/No)	Rationale
Ref: SC_06 Project: SOBR2 subsea fibre optic cable Developer: Microsoft Planning Ref: N/A	35.0	10.9	3	No	
Ref: SC_43 Project: LirlC Interconnector Developer: Transmission Investment Planning Ref: N/A	179.1	160.3	3	No	
Ref: CA_16 Project: MP2 Project Developer: Dublin Port Company Planning Ref: PA29N.304888	25.1	4.2	1	Yes	Projects within ZOI, with potential impact-receptor-pathway and with planned construction phase temporal overlap.
Ref: CA_68 Project: Maintenance dredging River Boyne, Drogheda Developer: Drogheda Port Company Planning Ref: FS007028 and S0015-03	69.1	42.7	1	Yes	
Ref: CA_11 Project: Development at Howth Fishery Harbour Centre (dredging and reclamation works) Developer: Minister for Agriculture, Food and the Marine Planning Ref: PL06F.314487	22.4	8.0	1	Yes	
Ref: CA_30 Project: Arklow Bank Wind Park 2 O&M	30.8	33.1	1	Yes	

Development	Distance from Array Site (km)	Distance from OECC (km)	Tier	Included in the CEA? (Yes/No)	Rationale
Facility Developer: Sure Partners Limited Planning Ref: WCC 211316					
Ref: CA_33 Project: 3FM Project Developer: Dublin Port Company Planning Ref: PA29N.320250	31.3	0.6	1	Yes	
Ref: CA_40 Project: Maintenance Dredging in Dublin Port Developer: Dublin Port Company Planning Ref: FS007132 and S0004-03	32.2	0.8	1	Yes	
Ref: CA_45 Project: Greater Dublin Drainage Project Developer: Irish Water Planning Ref: PL06F.314488	33.1	9.9	1	Yes	
Ref: CA_71 Project: Carnsore Wind Farm (Onshore) Developer: Hibernian Wind Power Limited Planning Ref: WCC 20211222	98.6	103.1	1	Yes	
Ref: CA_114 Project: An Daingean Fishery Harbour Centre Developer: Department of Agriculture, Food and the Marine Planning Ref: PL08.320804	315.5	304.9	1	Yes	

Development	Distance from Array Site (km)	Distance from OECC (km)	Tier	Included in the CEA? (Yes/No)	Rationale
Ref: SUR_24 Project: Site investigation activities to inform the development of the North Irish Sea Array OWF Developer: Statkraft Planning Ref: LIC230001	62.0	41.7	1	Yes	
Ref: SUR_40 Project: Site investigation activities to inform the development of the Oriel OWF Developer: Statkraft Planning Ref: FS006459	84.4	61.1	1	Yes	
Ref: SUR_54 Project: Site investigation activities in relation to the deep water terminal development on Foynes island Developer: Shannon Foynes Planning Ref: LIC230014	225.2	210.8	1	Yes	
Ref: CCS_01 Project: HyNet North West Industrial Cluster & Liverpool Bay CO ₂ Storage Developer: Eni UK / Liverpool Bay CCS Ltd Planning Ref: N/A	148.1	152.0	1	Yes	
Ref: CCS_15 Project: East Coast Cluster & Northern Endurance CO ₂ Storage Developer: Northern Endurance Partnership Planning Ref: N/A	484.9	488.8	1	Yes	

Development	Distance from Array Site (km)	Distance from OECC (km)	Tier	Included in the CEA? (Yes/No)	Rationale
Ref: DAS_03 Project: Dumping at Sea arising from capital dredging works under the MP2 Project Developer: Dublin Port Company Planning Ref: S0024-02	23.2	3.7	1	Yes	
Ref: DAS_04 Project: Maintenance Dredging in Dublin Port Developer: Dublin Port Company Planning Ref: FS007132 and S0004-03	23.2	3.7	1	Yes	
Ref: DAS_06 Project : Maintenance Dredging in River Boyne Developer : Drogheda Port Company Planning Ref: S0015-03	69.1	44.1	1	Yes	
Ref: DAS_19 Project: Dredging and Dumping at Sea arising from the Dublin Harbour Capital Dredging Project Developer: Dublin Port Company Planning Ref: S0033-01 and FS007164	23.2	3.7	1	Yes	

Table 7-4 Summary of other developments screened into the CEA for intertidal ornithology

Development	Distance from OECC (km)	Tier	Included in the CEA (Yes/No)	Rationale
Ref: DAS_19 Project: Dredging and Dumping at Sea arising from the Dublin Harbour Capital Dredging Project Developer: Dublin Port Company Planning Ref: S0033-01 and FS007164	3.7	1	Yes	No overlap with SPA but immediately adjacent to southern part of SPA boundary. Potential impact-receptor-pathway and with temporal overlap with project construction phase.
Ref: CA_16 Project: MP2 Project Developer: Dublin Port Company Planning Ref: PA29N.304888	4.2	1	Yes	
Ref: CA_40 Project: Maintenance Dredging in Dublin Port Developer: Dublin Port Company Planning Ref: FS007132 and S0004-03	0.8	1	Yes	
Ref: DAS_04 Project: Maintenance Dredging in Dublin Port Developer: Dublin Port Company Planning Ref: FS007132 and S0004-03	3.7	1	Yes	
Ref: CA_33 Project: 3FM Project Developer: Dublin Port Company Planning Ref: PA29N.320250	0.6	1	Yes	
Ref: SC_03 Project: SOBR1 subsea fibre optic cable Developer: Microsoft Planning Ref: N/A	1.6	3	No	Data are not available

Development	Distance from OECC (km)	Tier	Included in the CEA (Yes/No)	Rationale
Ref: ONS_016 Project: Powering Up Dublin Developer: EirGrid Planning Ref: N/A	0	3	No	

7.5 Stage 4: Assessment of cumulative effects

7.5.1 Construction phase

Cumulative Impact 1: Disturbance and displacement

Array site

Guillemot, razorbill, red-throated diver and gannet

276. Construction phase activity and the presence of built infrastructure within the array site is considered to result in potential cumulative disturbance and displacement effects with other projects for four seabird receptors where residual project only impact significance levels are assessed to be greater than imperceptible:
- Guillemot;
 - Razorbill;
 - Red-throated diver; and
 - Gannet.
277. The estimated displacement mortalities to each receptor associated with each project considered in CEA are presented in **Appendix 1 - Ornithology Quantitative Tables**, where these impacts are summed with half of the operational phase displacement mortality estimate for the CWP Project to determine cumulative construction phase displacement impacts to regional populations. These impacts to regional populations are presented as estimated proportional increases to background annual regional mortality levels to determine the magnitude of cumulative construction phase displacement impacts to each species. This information is summarised in **Table 7-5**.

Table 7-5 Cumulative displacement mortality estimates (during construction phase of CWP Project) and predicted impacts to regional mortality rates

Cumulative scenario	Species			
	Guillemot	Razorbill	Red-throated diver	Gannet
Displacement mortality estimates (individuals)				
Cumulative without CWP Project	842.85	249.99	7.58	57.34
CWP Project (construction phase)	42.41	15.21	0.735	0.93
Cumulative including CWP Project	885.26	265.2	8.315	58.27
Predicted impact to regional mortality rate				
Cumulative without CWP Project	0.465%	0.306%	0.266%	0.049%
CWP Project (construction phase)	0.023%	0.019%	0.026%	0.001%
Cumulative including CWP Project	0.488%	0.325%	0.292%	0.050%

278. Impact magnitudes are attributed in accordance with the assessment criteria outlined in **Table 10.10** of **Volume 3 Chapter 10 Ornithology** [either Negligible (i.e., <0.1% increase to regional mortality rate)]

or Low (0.1–1% increase to regional mortality rate)] and considered in relation to the assessed sensitivities of each species to disturbance and displacement impacts outlined in **Table 10-39** of **Volume 3 Chapter 10 Ornithology** to determine impact significance in accordance with the assessment criteria outlined in **Table 10-11** of **Volume 3 Chapter 10 Ornithology**. This process is summarised for each species in **Table 7-6**.

Table 7-6 Summary of assessment parameters and impact significance conclusions for cumulative displacement impacts (during construction phase of CWP Project)

Assessment parameters	Species			
	Guillemot	Razorbill	Red-throated diver	Gannet
Cumulative impact magnitude	Low	Low	Low	Negligible
Receptor sensitivity	High	High	High	High
Cumulative impact significance	Slight	Slight	Slight	Not Significant
Significant in EIA terms?	No	No	No	No

279. In conclusion, cumulative disturbance and displacement impacts to all receptors considered in CEA from construction phase activities within the array site are assessed to be **not significant** in EIA terms.

Offshore OECC (<MLWS)

Red-throated diver

280. Construction phase vessel activity within the offshore part of the OECC is considered to result in the potential for cumulative disturbance and displacement effects with other projects to the regional red-throated diver population.
281. For the CWP Project alone, as detailed for Offshore and Intertidal – Construction: Impact 2 – Disturbance and displacement within **Volume 3 Chapter 10 Ornithology**, the magnitude of residual red-throated diver displacement impacts associated with construction phase activity within the OECC is assessed to be negligible. This is due to:
- The limited spatial and temporal extent of cable installation works within the offshore area of the OECC, i.e., activity by up to five vessels at one time to install each of the three export cables over an estimated total of 63 days within a 27-month window, and associated seabed preparation activities;
 - Construction phase works within the offshore area of the OECC occurring within an area where baseline levels of vessel activity (and resultant disturbance of red-throated divers) are very high; and
 - Works being undertaken in accordance with additional mitigation in the form of a Construction Environmental Management Plan, and Ecological Vessel Management Plan (EVMP) containing measures intended to further reduce the non significant effects of disturbance and displacement effects to red-throated diver. Specifically, the avoidance, where possible, of designated areas for red-throated divers (i.e., The Murrough SPA and the North-West Irish Sea SPA) during transit and preferential transit routing along existing shipping lanes (where baseline levels of vessel activity are already high), so as to minimise additional vessel traffic within areas where baseline vessel activity levels and associated potential disturbance levels to red-throated diver are lower.

282. Although precise quantification of potential mortality resulting from disturbance and displacement from construction phase vessel activity within the offshore part of the OECC is not possible, it is assumed that the addition of any such negligible impact to regional cumulative displacement mortality estimates during the construction phase (as presented in **Table 7-5**, above) does not have any potential to materially alter conclusions relating to consequences upon regional populations (i.e., cumulative impact significance levels summarised in **Table 7-6** above). As such, cumulative disturbance and displacement impacts to red-throated diver associated with construction phase activities within the OECC are assessed to be **not significant** in EIA terms.

Intertidal OECC (MLWS to MHWS)

Sterna terns (common, Arctic and roseate) and Sandwich tern

283. Construction phase activity within and surrounding the intertidal part of the OECC is considered to result in the potential for cumulative disturbance and displacement effects with other projects to regional populations of Sterna terns (common, Arctic and roseate) and Sandwich tern.
284. For the CWP Project alone, as detailed for Offshore and Intertidal – construction: impact 2 – disturbance and displacement within **Volume 3 Chapter 10 Ornithology**, the magnitude of residual disturbance and displacement impacts to these receptors associated with construction phase activity within the intertidal part of the OECC is assessed to be Low. This is due to:
- Works being undertaken in accordance with additional mitigation in the form of seasonal restrictions to construction phase activity within and surrounding intertidal areas (limiting such works to the April to August, inclusive, period) and temporal restrictions preventing works in such areas during crepuscular and nocturnal periods within the post-breeding period in which internationally important tern aggregations utilise South Dublin Bay as roosting site (mid-July to August, inclusive).
 - The limited number of individuals predicted to experience visual and / or acoustic disturbance stimuli associated with construction phase activities within and surrounding the intertidal part of the OECC when works are conducted outside of restricted periods.
285. Although information relating to potential displacement of Sterna terns and Sandwich terns associated with construction phase activities within and surrounding the intertidal part of the OECC export cable installation of other projects listed in **Table 7-4** (which would potentially occur concurrently with export cable installation activities for CWP Project) is presently unavailable, it is assumed that where other projects identify potential non-negligible displacement impacts, similar mitigation measures will be implemented to minimise potential disturbance.
286. In the absence of information relating to potential displacement of tern species associated with other projects listed in **Table 7-4** the addition of low magnitude CWP Project only construction phase disturbance and displacement impacts within the intertidal part of the OECC to cumulative disturbance and displacement impacts of other relevant plans and projects to regional Sterna tern and Sandwich tern populations is not considered to have any potential to materially alter conclusions relating to consequences upon regional populations. As such, cumulative disturbance and displacement impacts to Sterna terns and sandwich terns associated with construction phase activities within the intertidal part of the OECC are assessed to be **not significant** in EIA terms.

Redshank

287. Construction phase activity within and surrounding the intertidal part of the OECC is considered to result in the potential for cumulative disturbance and displacement effects with other projects to regional populations of redshank.

288. For the CWP Project alone, as detailed for Offshore and Intertidal – construction: impact 2 – disturbance and displacement within **Volume 3 Chapter 10 Ornithology**, the magnitude of residual disturbance and displacement impacts to this receptor associated with construction phase activity within the intertidal part of the OECC is assessed to be negligible. This is due to:
- Works being undertaken in accordance with additional mitigation in the form of seasonal restrictions to construction phase activity within and surrounding intertidal areas (limiting such works to the mid-April to August, inclusive, period).
 - The limited number of individuals predicted to experience visual and / or acoustic disturbance stimuli associated with construction phase activities within and surrounding the intertidal part of the OECC when works are conducted outside of restricted periods.
289. Although information relating to potential displacement of redshank associated with construction phase activities within and surrounding the intertidal part of the OECC export cable installation of other projects listed in **Table 7-4** (which would potentially occur concurrently with export cable installation activities for CWP Project) is presently unavailable, it is assumed that where other projects identify potential non-negligible displacement impacts, similar mitigation measures will be implemented to minimise potential disturbance.
290. In the absence of information relating to potential displacement of redshank associated with other projects listed in **Table 7-4** the addition of negligible magnitude CWP Project only construction phase disturbance and displacement impacts within the intertidal part of the OECC to cumulative disturbance and displacement impacts of other relevant plans and projects to regional redshank populations is not considered to have any potential to materially alter conclusions relating to consequences upon regional populations. As such, cumulative disturbance and displacement impacts to redshank associated with construction phase activities within the intertidal part of the OECC are assessed to be **not significant** in EIA terms.

7.5.2 Operation and maintenance phase

Cumulative Impact 1: Disturbance and displacement

Array site

Guillemot, razorbill, red-throated diver and gannet

291. Operation and maintenance phase activity and the presence of built infrastructure within the array site is considered to result in potential cumulative disturbance and displacement effects with other projects for four seabird receptors where residual project only impact significance levels are assessed to be greater than imperceptible:
- Guillemot;
 - Razorbill;
 - Red-throated diver; and
 - Gannet.
292. The estimated displacement mortalities to each receptor associated with each project considered in CEA are presented in **Appendix 1 - Ornithology Quantitative Tables**, where these impacts are summed with the operation and maintenance phase displacement mortality estimate for the CWP Project to determine cumulative operation and maintenance phase displacement impacts to regional populations. These impacts to regional populations are presented as estimated proportional increases to background annual regional mortality levels to determine the magnitude of cumulative operation

and maintenance phase displacement impacts to each species. This information is summarised in **Table 7-7**.

Table 7-7 Cumulative displacement mortality estimates (during operation and maintenance phase of CWP Project) and predicted impacts to regional mortality rates

Cumulative scenario	Species			
	Guillemot	Razorbill	Red-throated diver	Gannet
Displacement mortality estimates (individuals)				
Cumulative without CWP Project	842.85	249.99	7.58	57.34
CWP Project (operation and maintenance phase)	84.82	30.42	1.47	1.86
Cumulative including CWP Project	927.67	280.41	9.05	59.20
Predicted impact to regional mortality rate				
Cumulative without CWP Project	0.465%	0.306%	0.266%	0.049%
CWP Project (operation and maintenance phase)	0.047%	0.037%	0.052%	0.002%
Cumulative including CWP Project	0.512%	0.344%	0.318%	0.051%

293. Impact magnitudes are attributed in accordance with the assessment criteria outlined in **Table 10.10** of **Volume 3, Chapter 10 Ornithology** [either Negligible (i.e., <0.1% increase to regional mortality rate) or Low (0.1–1% increase to regional mortality rate)] and considered in relation to the assessed sensitivities of each species to disturbance and displacement impacts outlined in **Table 10.39** of **Volume 3, Chapter 10 Ornithology** to determine impact significance in accordance with the assessment criteria outlined in **Table 10.11** of **Volume 3, Chapter 10 Ornithology**. This process is summarised for each species in **Table 7-8**.

Table 7-8 Summary of assessment parameters and impact significance conclusions for cumulative displacement impacts (during operation and maintenance phase of CWP Project)

Assessment parameters	Species			
	Guillemot	Razorbill	Red-throated diver	Gannet
Cumulative impact magnitude	Low	Low	Low	Negligible
Receptor sensitivity	High	High	High	High
Cumulative impact significance	Slight	Slight	Slight	Not Significant
Significant in EIA terms?	No	No	No	No

294. In conclusion, cumulative disturbance and displacement impacts to all receptors considered in CEA from operation and maintenance phase activities within the array site are assessed to be **not significant** in EIA terms.

Cumulative Impact 2: Collision

Kittiwake, Herring gull, Great black-backed gull, Gannet and Common tern

295. Operational WTG infrastructure within the array site is considered to result in potential cumulative collision effects with other projects for five seabird receptors where residual project only impact significance levels are assessed to be greater than imperceptible:
- Kittiwake;
 - Herring gull;
 - Great black-backed gull;
 - Gannet; and
 - Common tern.
296. The estimated collision mortalities to each receptor associated with each project considered in CEA are presented in **Appendix 1 - Ornithology Quantitative Tables**, where these impacts are summed with the collision mortality estimate for the CWP Project to determine cumulative collision impacts to regional populations. These impacts to regional populations are presented as estimated proportional increases to background annual regional mortality levels to determine the magnitude of cumulative operation and maintenance phase collision impacts to each species. This information is summarised in **Table 7-9**.

Table 7-9 Cumulative collision mortality estimates and predicted impacts to regional mortality rates

Cumulative scenario	Species				
	Kittiwake	Herring gull	Great black-backed gull	Gannet	Common tern
Collision mortality estimates (individuals)					
Cumulative without CWP Project	839.25	312.18	152.47	131.47	21.22
CWP Project (Design Option A*)	18.28	27.41	4.15	0.89	2.27
Cumulative including CWP Project	857.53	339.59	156.62	132.36	23.49
Predicted impact to regional mortality rate					
Cumulative without CWP Project	0.577%	0.970%	3.005%	0.113%	0.150%
CWP Project	0.013%	0.085%	0.082%	0.001%	0.016%
Cumulative including CWP Project	0.589%	1.055%	3.087%	0.114%	0.166%

*CWP Design Option A is the project-only design option for which collision mortality estimates are greatest.

297. Where proportional increases to annual regional mortalities exceeds 1% of background levels Population Viability Analyses (PVA) were undertaken to provide additional context to cumulative impact magnitude decisions. For Kittiwake, as impact significance assessments ultimately were determined to be moderate, which may or may not be considered significant in EIA terms, although not meeting the 1% increase to baseline mortality criteria specified regarding a requirement for PVA to inform impact magnitude decisions, a PVA was undertaken nonetheless to provide additional clarity on whether cumulative impacts were considered significant in EIA terms.
298. For species for which PVAs were undertaken (Kittiwake, Herring gull and Great black-backed gull), information relating to PVA methodologies for CEA is provided in in **Section 2.1.2 of Appendix 4 Population Viability Analysis in Volume 7** of the NIS, with information relating to updated inputs for

the FIR included in **Appendix 1 - Ornithology Quantitative Tables**. Relevant PVA outputs in the form of counterfactuals of population growth rate (CGR) and population size (CPS) at the end of the 25-year operational period of the CWP Project are summarised for each species in **Table 7-10**. As PVAs were conducted without inclusion of density dependence effects, the most appropriate output in relation to impact significance is CGR. For ease of review, CGR values greater than 0.995 do not constitute a significant reduction in the viability of the population.

Table 7-10 Cumulative collision impact PVA counterfactual outputs. (CGR = Counterfactual of population Growth Rate; CPS = Counterfactual of Population Size [after 25 years of impact])

Cumulative scenario	Species					
	Kittiwake		Herring gull		Great black-backed gull	
	CGR	CPS	CGR	CPS	CGR	CPS
Cumulative without CWP Project	0.999	0.973	0.998	0.949	0.997	0.923
CWP Project	1.000	0.999	1.00	0.995	1.000	0.998
Cumulative including CWP Project	0.999	0.972	0.998	0.945	0.997	0.921

299. As CGR values of cumulative collision impacts to regional populations of all species exceed 0.995, these very small reductions in population growth rates will not affect the population dynamics of these receptors in such a way to constitute a significant adverse effect to those regional populations. Consequently, cumulative collision impact magnitudes to these receptors are assessed as low.
300. Impact magnitudes are attributed in accordance with the assessment criteria outlined in **Table 10.10** of **Volume 3, Chapter 10 Ornithology** [either Negligible (i.e., <0.1% increase to regional mortality rate) or Low (0.1–1% increase to regional mortality rate), or, where increases to regional mortality rates exceed 1%, as informed by PVA modelling – **Table 7-10**, above] and considered in relation to the assessed sensitivities of each species to collision impacts outlined in **Section 10.10.3** of **Volume 3, Chapter 10 Ornithology** to determine impact significance in accordance with the assessment criteria outlined in **Table 10.11** of **Volume 3, Chapter 10 Ornithology**. This process is summarised for each species in **Table 7-11** below.

Table 7-11 Summary of assessment parameters and impact significance conclusions for cumulative collision impacts

Assessment parameters	Species				
	Kittiwake	Herring gull	Great black-backed gull	Gannet	Common tern
Cumulative impact magnitude	Low	Low	Low	Low	Negligible
Receptor sensitivity	Very High	High	Medium	High	High
Cumulative impact significance	Moderate	Slight	Slight	Slight	Not significant
Significant in EIA terms?	No	No	No	No	No

301. In conclusion, cumulative collision impacts to all receptors considered in CEA are assessed to be **not significant** in EIA terms.

7.6 CEA summary

302. This CEA, which supports EIAR **Volume 3, Chapter 10** has assessed the potential cumulative effects on offshore ornithology from the construction and operation and maintenance phases of the CWP Project alongside other developments.
303. **Table 7-12** below has been adopted from the PINS advice on CEA for NSIPs (PINS, 2024) as a means of summarising the potential adverse or beneficial cumulative effects of the CWP Project with other development. It summarises the outcomes of the detailed assessment provided above and sets out the proposed mitigation measures needed to address cumulative effects, if deemed necessary.
304. In summary, the CEA for Ornithology does not identify any significant cumulative effects resulting from the CWP Project alongside other developments.

Table 7-12 CEA Summary offshore ornithology

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
Construction phase				
Cumulative Impact 1: Disturbance and displacement: Array site [Guillemot, Razorbill, Red-throated diver and Gannet]				
OWF_01, OWF_02, OWF_03, OWF_04, OWF_06, OWF_08, OWF_09, OWF_12, OWF_13, OWF_15, OWF_17, OWF_18, OWF_19, OWF_20, OWF_21, OWF_22, OWF_23, OWF_24, OWF_25, OWF_26, OWF_28, OWF_32, OWF_33, OWF_36, OWF_38, OWF_39, OWF_42, CA_11, CA_16, CA_30, CA_33, CA_40, CA_45, CA_68, CA_71, CA_114, SUR_24, SUR_40, SUR_54, CCS_01, CCS_15, DAS_03, DAS_04, DAS_06, DAS_19	1	Guillemot – Slight (Not significant in EIA terms) Razorbill – Slight (Not significant in EIA terms) Red-throated diver – Slight (Not significant in EIA terms) Gannet – Not significant (Not significant in EIA terms)	No additional mitigation required	Guillemot – Slight (Not significant in EIA terms) Razorbill – Slight (Not significant in EIA terms) Red-throated diver – Slight (Not significant in EIA terms) Gannet – Not significant (Not significant in EIA terms)

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
Cumulative Impact 1: Disturbance and displacement: Offshore OECC (<MLWS) [Red-throated diver]				
OWF_01, OWF_02, OWF_03, OWF_04, OWF_06, OWF_08, OWF_09, OWF_12, OWF_13, OWF_15, OWF_17, OWF_18, OWF_19, OWF_20, OWF_21, OWF_22, OWF_23, OWF_24, OWF_25, OWF_26, OWF_28, OWF_32, OWF_33, OWF_36, OWF_38, OWF_39, OWF_42, CA_11, CA_16, CA_30, CA_33, CA_40, CA_45, CA_68, CA_71, CA_114, SUR_24, SUR_40, SUR_54, CCS_01, CCS_15, DAS_03, DAS_04, DAS_06, DAS_19	1	Red-throated diver – Not significant (Not significant in EIA terms)	No additional mitigation required	Red-throated diver – Not significant (Not significant in EIA terms)
Cumulative Impact 1: Disturbance and displacement: Intertidal OECC (MLWS to MHWS) [Common tern, Arctic tern, Roseate tern, Sandwich tern and Redshank]				
DAS_19, CA_16, CA_40, DAS_04, CA_33	1	Common tern– Slight (Not significant in EIA terms) Arctic tern – Slight (Not significant in EIA terms) Roseate tern – Slight (Not significant in EIA terms)	No additional mitigation required	Common tern– Slight (Not significant in EIA terms) Arctic tern – Slight (Not significant in EIA terms) Roseate tern – Slight (Not significant in EIA terms)

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
		Sandwich tern – Not significant (Not significant in EIA terms) Redshank – Not significant (Not significant in EIA terms)		Sandwich tern – Not significant (Not significant in EIA terms) Redshank – Not significant (Not significant in EIA terms)

Operation and maintenance phase

Cumulative Impact 1: Disturbance and displacement: Array site [Guillemot, Razorbill, Red-throated diver and Gannet]

OWF_01, OWF_02, OWF_03, OWF_04, OWF_06, OWF_08, OWF_09, OWF_12, OWF_13, OWF_15, OWF_17, OWF_18, OWF_19, OWF_20, OWF_21, OWF_22, OWF_23, OWF_24, OWF_25, OWF_26, OWF_28, OWF_32, OWF_33, OWF_36, OWF_38, OWF_39, OWF_42, CA_11, CA_16, CA_30, CA_33, CA_40, CA_45, CA_68, CA_71, CA_114, SUR_24, SUR_40, SUR_54, CCS_01, CCS_15, DAS_03, DAS_04, DAS_06, DAS_19	1	Guillemot – Slight (Not significant in EIA terms) Razorbill – Slight (Not significant in EIA terms) Red-throated diver – Slight (Not significant in EIA terms) Gannet – Not significant (Not significant in EIA terms)	No additional mitigation required	Guillemot – Slight (Not significant in EIA terms) Razorbill – Slight (Not significant in EIA terms) Red-throated diver – Slight (Not significant in EIA terms) Gannet – Not significant (Not significant in EIA terms)

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
Cumulative Impact 2: Collision: Array site [Kittiwake, Herring gull, Great black-backed gull, Gannet and Common tern]				
OWF_01, OWF_02, OWF_03, OWF_04, OWF_06, OWF_08, OWF_09, OWF_12, OWF_13, OWF_15, OWF_17, OWF_18, OWF_19, OWF_20, OWF_21, OWF_22, OWF_23, OWF_24, OWF_25, OWF_26, OWF_28, OWF_32, OWF_33, OWF_36, OWF_38, OWF_39, OWF_42, CA_11, CA_16, CA_30, CA_33, CA_40, CA_45, CA_68, CA_71, CA_114, SUR_24, SUR_40, SUR_54, CCS_01, CCS_15, DAS_03, DAS_04, DAS_06, DAS_19	1	Kittiwake – Moderate (Not significant in EIA terms) Herring gull – Slight (Not significant in EIA terms) Great black-backed gull – Slight (Not significant in EIA terms) Gannet – Slight (Not significant in EIA terms) Common tern – Not significant (Not significant in EIA terms)	No additional mitigation required	Kittiwake – Moderate (Not significant in EIA terms) Herring gull – Slight (Not significant in EIA terms) Great black-backed gull – Slight (Not significant in EIA terms) Gannet – Slight (Not significant in EIA terms) Common tern – Not significant (Not significant in EIA terms)

7.7 References

305. Planning Inspectorate (PINS). (2024). Nationally Significant Infrastructure Projects: Advice on Cumulative Effects Assessment. Available at: <https://www.gov.uk/guidance/nationally-significant-infrastructure-projects-advice-on-cumulative-effects-assessment> . (Accessed 13/03/2026).

8 Estuarine/Liffey & Onshore Ornithology

8.1 Introduction

306. This section of the CEA Report presents the findings of the CEA for the estuarine/Liffey and onshore ornithology which considers the residual effects presented in **EIAR Volume 3, Chapter 10 Ornithology** alongside the potential effects of other proposed and reasonably foreseeable development. Cumulative effects are considered in this document across the construction and operation and maintenance phases of the CWP Project.
307. This updated CEA incorporates information from the project alone assessment presented in **EIAR Volume 3, Chapter 10 Ornithology** and Section 10 of the **EIAR Addendum**. It has been updated in response to the requests made in item 5 of the FIR.

8.2 Consultation

308. Stakeholder and regulator feedback received during the consultation process that is relevant to the assessment is provided in **Volume 3, Chapter 10 Ornithology**.
309. There was no specific feedback received from stakeholder and regulators relevant to the CEA during the consultation processes.

8.3 CEA Impact Screening

310. The first step in the CEA for estuarine/Liffey and onshore ornithology is the identification of which residual impacts assessed for the CWP Project alone have the potential for a cumulative impact with other development (described as 'impact screening'). This screening exercise is set out in **Table 8-1** below.
311. Only potential impacts assessed in **EIAR Volume 3, Chapter 10 Ornithology** and Section 10 of the **EIAR Addendum** as 'not significant' or above are included in the CEA (i.e., those assessed as 'imperceptible' are not taken forward as there is no potential for them to contribute to a cumulative effect).

Table 8-1 Impacts and potential for cumulative effect – estuarine/Liffey and onshore

Impact	CWP Project alone residual effect	Potential for significant cumulative effect – screened into the CEA (Yes / No)
Construction		
Onshore - Construction: Impact 1 - Direct effects on habitat	Greenfinch: Imperceptible Linnet: Imperceptible Sand martin: Slight	Yes for Sand martin

Impact	CWP Project alone residual effect	Potential for significant cumulative effect – screened into the CEA (Yes / No)
Onshore - Construction: Impact 2 - Disturbance and displacement	Light-bellied Brent Goose, Greenfinch, Linnet, Peregrine falcon and Sand martin: Imperceptible	No
Onshore - Construction: Impact 3 – Introduction of invasive non-native species.	Light-bellied Brent Goose: Imperceptible	No
Estuarine / Liffey Construction: Impact 1 - Direct effects on habitat	Black guillemot: Slight	Yes
Estuarine / Liffey Construction: Impact 2 - Disturbance and displacement	Arctic tern, Black guillemot, Black-headed gull, Common tern: Imperceptible	No
Operation		
Estuarine / Liffey Operation and Maintenance: Impact 1 - Disturbance and displacement	Arctic tern: Imperceptible	No
Estuarine / Liffey Operation and Maintenance: Impact 2 - Presence of onshore buildings / infrastructure	Common tern: Not Significant Arctic tern: Slight	Yes for Common tern and Arctic tern
Decommissioning		
Onshore Decommissioning: Impact 1 - Direct effects on habitat	The detail and scope of the decommissioning works for the CWP Project will be determined by the relevant legislation and guidance at the time of decommissioning. Project alone impacts during the decommissioning phase of the CWP Project are assessed in Volume 3, Chapter 10 Ornithology and Section 10 of the EIAR Addendum. It is anticipated that the impacts will be no greater than those identified for the construction phase, and therefore no separate assessment of cumulative impacts during the decommissioning phase is presented within this CEA.	
Onshore Decommissioning: Impact 2 - Disturbance and displacement		
Onshore Decommissioning: Impact 3 - Introduction of invasive non-native species		
Estuarine / Liffey Decommissioning: Impact 1 - Direct effects on habitat		

Impact	CWP Project alone residual effect	Potential for significant cumulative effect – screened into the CEA (Yes / No)
Estuarine / Liffey Decommissioning: Impact 2 - Disturbance and displacement		

8.4 Stage 3: Information gathering and ‘other development’ screening

312. Stage 2 of the CEA is presented in **Appendix 1** of **Part 1** of the **CEA Report**. This exercise established a shortlist of other development for onshore ornithology using set screening criteria.
313. The shortlist of other development screened into the CEA for onshore ornithology at Stage 2 are listed below.
- Dublin Port Company (DPC) – MP2 Project (ONS_035 and ONS_036);
 - DPC - 3FM Dublin Project (ONS_058);
 - DPC – Bridge over existing cooling water channel (superseded by CWP project proposals) (ONS_056);
 - Electricity Supply Board (ESB) – Dublin Bay Power Station / Open Cycle Gas Turbine (OCGT), BESS and Flexible Thermal Generation (ONS_026, ONS_027 and ONS_028);
 - ESB – Poolbeg Generating Station / Battery Energy Storage System (BESS), Flexible Thermal Generation, OCGT and Substation (ONS_022, ONS_023 and ONS_024);
 - EirGrid – Poolbeg 220kV Substation (ONS_021)
 - Hammond Lane Metal Company Ltd – Construction of two-storey building and non-ferrous metals recovery facility (ONS_055);
 - Pembroke Beach DAC / Becbay Ltd and Fabrizia Developments Ltd – Redevelopment of former Irish Glass Bottle Site (ONS_011 to ONS_015 and ONS_070 to ONS_079);
 - ED & F Man Liquid Products Ireland Ltd – New storage tanks and pipelines (ONS_031 and ONS_066);
 - Uisce Éireann– Ringsend Wastewater Treatment Plant Upgrade Project (ONS_009);
 - Kilsaran Concrete – Continuation of use of an existing concrete batching plant (ONS_054 and ONS_069);
 - Ecocem Ireland Limited – permission for the development consisting of the construction of silos, compressor rooms, cooling room, retaining walls, new fencing, new gate, revision of car park layout (ONS_059);
 - EirGrid – Powering Up Dublin (ONS_016);
 - Codema – Dublin's Energy Agency – Dublin District Heating System Project (DDHS) (ONS_053);
 - Marine Terminals Ltd - Gantry Replacement Works (ONS_065); and
 - Uisce Éireann – Ringsend WWTP upgrade works (ONS_087).
314. Information gathering (Stage 3 of the CEA) has enabled a further review of the other development shortlist for onshore ornithology, including a more detailed consideration of the location, nature and scale of the development, the timing of construction and operation activities, the information available to inform a CEA and the likelihood of a significant effect.
- This information has been used to screen the Stage 2 shortlist to establish a final list of other development for detailed assessment at Stage 4 of the CEA. The results of the exercise are presented in **Table 8-2** below.

Table 8-2 Summary of other development screened into the CEA for onshore ornithology

Development	Distance from the onshore infrastructure (km)	Tier	Included in the CEA (Yes/No)	Rationale
DPC - MP2 Project (ONS_035 and ONS_036) Planning/Foreshore Ref: FS006893 and ABP-304888-19	0	1	No	The MP2 Project is proposed on the northern side of Poolbeg, north of the River Liffey. The EIAR produced for the project states that there are no significant residual impacts predicted on avian receptors as a result of the construction and operation of the MP2 Project, including on black guillemot (RPS, 2018a). As there are no significant residual impacts predicted as a result of the MP2 Project, and considering that there will be no spatial overlap in the project construction working areas and given the distances between the projects, there is no potential for cumulative effects with the CWP Project. This development was not considered further.
DPC - 3FM Project (ONS_058) Planning Ref: 3041/24	0	1	Yes	Submitted in July 2024. The 3FM Project is the third and final Strategic Infrastructure Development (SID) Project needed to deliver the capacity objectives of the Dublin Port Masterplan 2040. Part of the masterplan includes work on the Poolbeg peninsula including the Southern port access road (SPAR) and the incorporation of a turning circle to the north of the substation. There is potential for a temporal overlap between the construction phase of this project and that of the CWP Project. Construction activities are likely to occur within up or close to the CWP Project onshore development area which could cause significant cumulative effects.
DPC -	0	1	No	The installation of a bridge over the cooling water channel into the onshore substation is included as part of the

Development	Distance from the onshore infrastructure (km)	Tier	Included in the CEA (Yes/No)	Rationale
Bridge over existing cooling water channel (superseded by CWP project proposals) (ONS_056) Planning Ref: 3711/18				onshore infrastructure. The location mirrors that of the DPC proposed bridge development. In the event that the CWP Project proceeds, this proposed bridge development would be superseded by the Project. On this basis, the proposed bridge development was not considered further in this assessment.
ESB Dublin Bay Power Station / OCGT, BESS and Flexible Thermal Generation (ONS_026, ONS_027 and ONS_028) Planning Ref: 3074/23, 3646/20 and 3647/20	0	1	No	There is no potential for a temporal overlap between the construction phase of these developments and that of the CWP Project. These developments will be operational before the CWP Project commences construction activities. Considering the lack of overlap of the construction phases, the potential for significant cumulative effects has been ruled out. During the operational phase, given the distance between these developments to the onshore substation, it was considered that there is no potential for significant cumulative effects. These developments were not considered further.
ESB Poolbeg Generating Station / BESS, Flexible Thermal Generation, OCGT and Substation (ONS_024, ONS_023, ONS_022) Planning Ref: 3074/23, 3646/20 and 3647/20	0	1	No	There is no potential for a temporal overlap between the construction phase of these developments and that of the CWP Project. These developments will be operational before the CWP Project commences construction activities. Considering the lack of potential overlap of the construction phases, the potential for significant cumulative effects has been ruled out. During the operational phase, given the distance between these developments to the onshore substation, it was

Development	Distance from the onshore infrastructure (km)	Tier	Included in the CEA (Yes/No)	Rationale
				considered that there is no potential for significant cumulative effects. These developments were not considered further.
EirGrid - Poolbeg 220kV Substation (ONS_021) Planning Ref: 4057/23	0 km	1	No	Construction will commence in early 2026 and will take approximately 36 months. This is the Poolbeg 220kV substation that the CWP Project will connect into. It has been assumed that this development will be operational when the CWP construction activities commence. There will be no temporal overlap in construction activities and therefore no potential for significant cumulative effects. During the operational phase, given the distance between this development to the onshore substation, it was considered that there is no potential for significant cumulative effects. This development was not considered further.
Hammond Lane Metal Company Ltd Construction of 2-storey building and non-ferrous metals recovery facility (ONS_055)	0	1	No	The proposed development was granted planning in 2018 and is likely to already be constructed before CWP construction activities commence. The Appropriate Assessment Screening Report prepared for the project concluded that the project (construction and operational phases) will not result in likely significant effect on European sites (Doherty Environmental, 2018). Considering the construction phases of the two projects will not overlap, the lack of operational phase impacts and the small scale (40 m x 10 m) nature of the development, there is no potential for cumulative effects with the CWP project.

Development	Distance from the onshore infrastructure (km)	Tier	Included in the CEA (Yes/No)	Rationale
				This development was not considered further.
Pembroke Beach DAC / Becbay Ltd & Fabrizia Developments Ltd Redevelopment of former glass bottle site (ONS_011 to ONS_015 and ONS_070 to ONS_79) Planning Refs: PWSZD3270/19; 1571/25; 2596/24; 3945/24; 3798/24; 3700/24; 2247/24; 2249/24; 2252/24, 3461/24; 3468/24)	0	1	No	Development of residential, office and mixed-use scheme at the former Irish Glass Bottle and Fabrizia sites at Poolbeg West. There is potential for a temporal overlap between the projects. However, a review of the available information has shown that there will be no spatial overlap in the project construction working areas, and a low risk of shared receptors. This development was not considered further.
E D & F Man Liquid Products Ireland Limited New Storage Tank (ONS_031 and ONS_066) Planning Ref: 2804/19 and 3908/23	0	1	No	No EIA or Environmental Report has been produced for these projects. However, considering the small-scale nature of the works there is no potential for significant cumulative effects with the CWP Project. It is also likely that the project timelines will not coincide, with the E D & F works being completed in advance of the CWP Project construction commencing. Therefore the projects were screened out from further assessment.
Uisce Éireann Ringsend Waste Water Treatment Plant Upgrade Project	0.25	1	No	Proposed development consists of 2 no. units comprising a Combined Heat and Power Engine and Steam Generator unit with roof top plant areas.

Development	Distance from the onshore infrastructure (km)	Tier	Included in the CEA (Yes/No)	Rationale
(ONS_009) Planning Ref: 5319/22				Considering the localised and small-scale nature of the project (c. 30 m ²), there is no potential for cumulative impacts with the CWP Project.
Kilsaran Concrete Continuation of use of an existing concrete batching plant (ONS_054 and ONS_069) Planning Ref: PWSDZ3469/22, 3890/24	0.3	1	No	The application is for the continuation of use of an existing concrete batching plant. As the plant is already in operation and will not change, the plant has therefore been considered within the baseline assessment. There is therefore no potential for cumulative impacts with the CWP Project. This development was not considered further.
Ecocem Ireland Limited Construction of Silos, compressor room and associated facilities. (ONS_059) Planning Ref: 3041/24	0	1	No	Construction of silos, compressor room, cooling room, pump room, retaining walls, new fencing, new gates, revision of car park layout and also includes for retention for silos, lab and offices at existing Ecocem facility within the Poolbeg Peninsula. This development is in receipt of a grant of planning. The construction phase is likely to be less than 4 months and completed before 2030. Additionally, the application is for minor developments within an existing operational site. As the plant is already in operation and proposed works are considered localised within an existing site boundary, it was concluded that there is no potential for significant cumulative effects with the CWP Project. This development was not considered further.
Codema	0	3	No	The DDHS will be a thermal energy network that uses energy from waste heat and distributes it as hot water

Development	Distance from the onshore infrastructure (km)	Tier	Included in the CEA (Yes/No)	Rationale
Dublin District Heating System (DDHS) (ONS_053) Planning Ref: N/A				through insulated dual (supply and return) pipelines to homes and business for space heating, hot water and industrial purposes. It is understood that this project will be located on a site within the Poolbeg peninsula, potentially in proximity to Construction Compound A. However, this project is not yet submitted for planning consent This project is not yet submitted. There is insufficient details available about this project to undertake a meaningful cumulative effects assessment. Therefore, the project is screened out from further assessment.
EirGrid Powering Up Dublin (ONS_016) Planning Ref: N/A	0	3	No	Works are required to upgrade Dublin City's electricity infrastructure. This includes the installation of 50 km of cables across the city. This will include underground cable routes, some of which will link to the Poolbeg ESB Poolbeg Generating Station. Final route technologies have not yet been confirmed, and this project has not yet been submitted for planning consent. There is insufficient detail available about this project to undertake a meaningful cumulative effects assessment. Therefore, the project is screened out from further assessment.
Marine Terminals Ltd - Demolition and removal of existing temporary reefer gantry & installation of a new steel frame reefer gantry (ONS_065).	0.04	1	No	The application is for minor developments within an existing operational site. As the site is already in operation and proposed works are considered localised within an existing site boundary, it was concluded that there is no potential for significant cumulative impacts with the CWP Project.

Development	Distance from the onshore infrastructure (km)	Tier	Included in the CEA (Yes/No)	Rationale
Planning Ref: 1840/25				This development was not considered further.
Uisce Éireann – Ringsend WWTP upgrade works (ONS_087) Planning Ref: 301798	0	1	No	These upgrades were undertaken within the confines of the existing WWTP site boundary, with the construction activities completed in 2025. The upgraded WWTP is currently operational. There is no overlap in construction phases. All upgrade works are within an existing and developed site boundary. With mitigation measures in place, no negative residual effects were predicted on birds. There is also a commitment to undertake operational phase monitoring to observe control measures for Japanese knotweed (Ringsend WWTP EIAR, 2018, TJ O'Connor et al). It was considered that there is no potential for significant cumulative effects, together with the CWP Project. This development was not considered further.

8.5 Stage 4: Assessment of cumulative effects

8.5.1 Construction phase

Cumulative impact 1: direct effects on habitats

Onshore

315. The CWP Project will result in the loss of habitat within the onshore area, which in turn, will result in the loss of a breeding colony of sand martin recorded within a harbour wall adjacent to the proposed onshore substation. Approximately four sand martin nests will be permanently lost to facilitate this proposed infrastructure.
316. The permanent loss of habitat at the CWP Project was considered a moderate negative effect in the absence of mitigation and has been determined as significant in EIA terms. Additional mitigation measures in the form of the provision of an artificial sand martin wall will mitigate against the loss of habitat and four sand martin nests (as well as increasing the number of nesting opportunities for the species i.e., the sand martin will with contain a minimum of 27 nesting cavities), thus reducing the impact significance to a slight negative effect making it not significant in EIA terms and removing the potential for cumulative impacts.
317. The accumulative effect of habitat losses (development listed in **Table 8-2** above) will not increase the magnitude of impact on this sand martin colony. The DPC 3FM project screened through for further assessment did not identify sand martin or identified suitable habitats for the species, as being at risk of being lost.
318. Furthermore, the policies and objectives listed in the Dublin City Council Development Plan (2022-2028) and the Dublin City Biodiversity Action Plan (2021-2025) will moderate the impacts on onshore habitats and flora from future proposed projects.

Estuarine / Liffey

319. The CWP Project will result in the loss of habitat within the estuarine / Liffey area, which in turn, will result in the loss of a confirmed breeding sites and potential breeding sites for black guillemot recorded within a harbour wall adjacent to the onshore substation. At least two active and three potential nest sites will be permanently lost to facilitate this proposed infrastructure.
320. The permanent loss of habitat at the CWP Project was considered to have a moderate negative effect in the absence of mitigation and has been determined as significant in EIA terms. Additional mitigation measures in the form of the provision of artificial nest boxes will mitigate against the loss of habitat and active nesting areas (as well as increasing the number of nesting opportunities for the species i.e., a minimum of four nest boxes will be erected), thus reducing the impact significance to a slight negative effect making it not significant in EIA terms and removing the potential for cumulative effects.
321. The cumulative effect of habitat losses (development listed in listed in **Table 8-2** above) will not increase the magnitude of this impact on the black guillemot population. The DPC 3FM project was the only development screened in for potential cumulative effects and the assessment identified the potential for impacts on black guillemot through the loss of habitat at eight known nesting sites. However, following the implementation of mitigation measures, including the provision of artificial nest boxes (consistent with the mitigation proposed for the CWP project), residual impacts arising from the DPC 3FM project were described as temporary and slight in nature.

322. On this basis, the cumulative effect of the CWP Project with the Dublin Port 3FM project is predicted to be slight (not significant in EIA terms) for the black guillemot population.

8.5.2 Operation and maintenance

Cumulative impact 2: presence of buildings / infrastructure

Estuarine / Liffey

323. The CWP project will result in permanent buildings / infrastructure at the onshore substation in proximity to the estuarine / Liffey area, which would increase the magnitude of the effect on Arctic tern and common tern (which are breeding in close proximity to the onshore substation), due to potential shadow cast and the creation of perching opportunities for predators such as peregrine falcon or hooded crow.
324. The presence of buildings / infrastructure from the CWP Project was considered to have a slight negative residual effect for Arctic tern and not significant negative residual effect for common tern. The accumulative effect of the presence of buildings / infrastructure (development listed in **Table 8-2** above) will not increase the magnitude of this impact on the Arctic tern and common tern colonies.
325. The DPC 3FM development described that operational phases effects were associated with disturbance (human-related) and collision risk (related with the SPAR bridge). These impacts were not associated with the breeding tern colonies (ESB and CDL Dolphins). Any residual effects from the operational phase of the DPC 3FM development were described as Imperceptible.
326. On this basis, it is considered that there will be no increase in the magnitude of impact on the Arctic tern and common tern breeding colonies. There is no potential for significant cumulative effects during the operational phase.

8.6 CEA summary

327. This CEA, which supports **Chapter 10 Ornithology** and Section 10 of the **EIAR Addendum** has assessed the potential cumulative effects on Ornithology (estuarine/Liffey and onshore) from the construction and operation and maintenance phases of the CWP Project alongside other developments.
328. **Table 8-3** below has been adopted from the PINS advice on CEA for NSIPs (PINS, 2024) as a means of summarising the potential adverse or beneficial cumulative effects of the CWP Project with other development. It summarises the outcomes of the detailed assessment provided above and sets out the proposed mitigation measures needed to address cumulative effects, if deemed necessary.
329. In summary, the CEA for ornithology does not identify any significant cumulative effects resulting from the CWP Project alongside other development. It is not considered necessary that additional mitigation measures would be required.

Table 8-3 Summary for potential adverse or beneficial cumulative effects on onshore ornithology of the CWP Project with other development.

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
Construction phase				
Cumulative Impact 1: Direct effects on habitats				
DPC 3FM Project (ONS_058)	1	Sand martin Slight (not significant in EIA terms)	No additional mitigation required	Sand martin Slight (not significant in EIA terms)
Operation and maintenance phase				
Cumulative impact 4: presence of buildings / infrastructure				
DPC 3FM Project (ONS_058)	1	Arctic tern - Slight (not significant in EIA terms) Common tern – Not Significant (not significant in EIA terms)	No additional mitigation required	Arctic tern - Slight (not significant in EIA terms) Common tern – Not Significant (not significant in EIA terms)

9 MARINE MAMMALS

9.1 Introduction

330. This section of the **CEA Report** presents the findings of the CEA for marine mammals, which considers the residual effects presented in **Volume 3, Chapter 11 Marine Mammals** alongside the potential effects of other proposed and reasonably foreseeable developments. Cumulative effects are considered in this document across the construction and operation and maintenance phases of the CWP Project.
331. The detail and scope of the decommissioning works for the CWP Project will be determined by the relevant legislation and guidance at the time of decommissioning. Project alone impacts during the decommissioning phase of the CWP Project are assessed in EIAR **Volume 3, Chapter 11 Marine Mammals**. It is anticipated that the impacts will be no greater than those identified for the construction phase, and therefore no separate assessment of cumulative impacts during the decommissioning phase is presented within this CEA.
332. Updates to the project alone assessment for marine mammals as a consequence of ACPs FIR are presented in Section 11 of the **EIAR Addendum**. This updated CEA incorporates relevant updates from the project alone assessment and has been updated in response to the requests made in item 5 of the FIR.

9.2 Consultation

333. No significant issues were raised during the pre-application consultation process with regards Marine Mammals in the context of CEA specifically. Stakeholder feedback on the CEA in response to the CWP Project planning application has been responded to in the FIR Response Document and the Observations Response Document, including confirmation of any updates made in response to the feedback received.

9.3 Stage 1: CEA impact screening

334. The first step in the CEA for marine mammals is the identification of which residual impacts assessed for the CWP Project alone have the potential for a cumulative impact with other development (described as 'impact screening'). This screening exercise is set out in **Table 9-1** below.
335. Only potential impacts assessed in EIAR **Volume 3, Chapter 11 Marine Mammals** as having a magnitude score of Low or above are included in the CEA (i.e. those assessed as having a magnitude score of 'negligible' are not taken forward as there is no potential for them to contribute to a cumulative effect).

Table 9-1 Impacts and potential for cumulative effect. Grey rows indicate impacts screened out of the CEA.

Impact	Potential for significant cumulative effect	Rationale
Construction		
Impact 1: Auditory injury permanent threshold shift (PTS) from pre-construction surveys	No	Mitigation measures will be put in place to reduce injury risk to marine mammals to negligible levels (as a requirement of European Protected Species legislation) for both the CWP Project alone, and other relevant plans and projects that may produce noise. This requirement is a legal requirement of all relevant jurisdictions.
Impact 2: Disturbance from pre-construction surveys	Yes	Potential for cumulative impacts.
Impact 3: Auditory injury (PTS) from UXO clearance	No	Mitigation measures will be put in place to reduce injury risk to marine mammals to negligible levels (as a requirement of European Protected Species legislation) for both the CWP Project alone, and other relevant plans and projects that may produce noise. This requirement is a legal requirement of all relevant jurisdictions.
Impact 4: Disturbance from UXO clearance	Yes	Potential for cumulative impacts.
Impact 5: Auditory injury (PTS) from piling – WTGs and OSS	No	Mitigation measures will be put in place to reduce injury risk to marine mammals to negligible levels (as a requirement of European Protected Species legislation) for both the CWP Project alone, and other relevant plans and projects that may produce noise. This requirement is a legal requirement of all relevant jurisdictions.
Impact 6: Disturbance from piling – WTGs and OSS	Yes	Potential for cumulative impacts.
Impact 7: Auditory injury (PTS) from piling – onshore substation	No	Mitigation measures will be put in place to reduce injury risk to marine mammals to negligible levels (as a requirement of European Protected Species legislation) for both the CWP Project alone, and other relevant plans and projects that may

Impact	Potential for significant cumulative effect	Rationale
		produce noise. This requirement is a legal requirement of all relevant jurisdictions.
Impact 8: Disturbance from piling – onshore substation	No	Highly localised impact with a negligible magnitude. Primary source of underwater noise disturbance is from pile driving of WTGs which has a full quantitative cumulative assessment provided.
Impact 9: Auditory injury (PTS) from other construction activities	No	Highly localised impact with a negligible magnitude.
Impact 10: Disturbance from other construction activities	Yes	Potential for cumulative impacts.
Impact 11: Vessel collision	No	Project specific Vessel Management Plans (VMPs) will be put in place to reduce this already low risk of impact for both the CWP Project alone, in compliance with Irish guidance, UK guidance, and in accordance with industry standard practice.
Impact 12: Disturbance from vessels	Yes	Potential for cumulative impacts.
Impact 13: Indirect impacts to prey	No	Highly localised impact with a negligible magnitude.

Operation and maintenance

Impact 1: Auditory injury (PTS) from operational noise	No	Mitigation measures will be put in place to reduce injury risk to marine mammals to negligible levels (as a requirement of European Protected Species legislation) for both the CWP Project alone, and other relevant plans and projects that may produce noise. This requirement is a legal requirement of all relevant jurisdictions.
Impact 2: Disturbance from operational noise	Yes	Potential for cumulative impacts.
Impact 3: Vessel collision	No	Project specific Vessel Management Plans (VMPs) will be put in place to reduce this already low risk of impact for both the CWP Project alone, in compliance with Irish guidance, UK guidance, and in accordance with industry standard practice.
Impact 4: Disturbance from vessels	Yes	Potential for cumulative impacts.

Impact	Potential for significant cumulative effect	Rationale
Impact 5: Indirect impacts to prey	No	

Decommissioning

The detail and scope of the decommissioning works for the CWP Project will be determined by the relevant legislation and guidance at the time of decommissioning. Project alone impacts during the decommissioning phase of the CWP Project are assessed in EIA **Volume 3, Chapter 11 Marine Mammals**. It is anticipated that the impacts will be no greater than those identified for the construction phase, and therefore no separate assessment of cumulative impacts during the decommissioning phase is presented within this CEA.

In summary the following impacts were screened out of the cumulative assessment:

- Auditory injury (PTS): since suitable mitigation will be put in place to reduce injury risk to marine mammals to negligible levels (as a requirement of European Protected Species legislation);
- Collision risk from vessel activity: since project specific VMPs will be put in place to reduce this already low risk of impact; and
- Indirect impacts to prey: since the CWP project alone assessment concluded a negligible magnitude.

In summary the following impacts were screened into the cumulative assessment:

- Disturbance from pre-construction surveys;
- Disturbance from UXO clearance;
- Disturbance from piling;
- Disturbance from other construction activities;
- Disturbance from construction vessels;
- Disturbance from operational noise; and
- Disturbance from operational vessels

9.4 Stages 2 and 3: Information gathering and 'other development' screening

336. Stage 2 of the CEA is presented in **Appendix 1 of Part 1 of the CEA Report**. This exercise established a shortlist of other development to be included in the CEA for marine mammals using set screening criteria.
337. Information gathering (Stage 3 of the CEA) has enabled a further review of the other development shortlist for marine mammals, including a more detailed consideration of the location, nature and scale of the development, the timing of construction and operation activities, the information available to inform a CEA and the likelihood of a significant effect. Screening ranges differed for each marine mammal species, depending on the relevant Management Unit.
338. The following screening rules were applied:
 - All projects that are located outside of the relevant species MU;
 - All projects that are already operational / active as they are considered to be existing impacts included within the baseline
 - All projects that are not expected to be constructing between 2025 and 2036 inclusive; and

- All projects where the timing of construction activities is unknown as it is therefore not possible to undertake a meaningful CEA

339. This information has been used to screen the Stage 2 shortlist to establish a final list of other development for detailed assessment at Stage 4 of the CEA (Stage 4: Assessment of cumulative effects).
340. The results of the exercise are presented in **Table 9-2** (other OWFs) and **Table 9-3** (other developments) below.

Table 9-2 Summary of other offshore wind developments screened into the CEA for Marine Mammals.

All included due to the potential for construction activities between 2025 and 2036 and subsequent O&M phase effects. HP = harbour porpoise (Celtic and Irish Sea MU), BND = bottlenose dolphin (Irish Sea MU), CD = common dolphin (Celtic and Greater North Seas MU), RD = Risso's dolphin (Celtic and Greater North Seas MU), MW = minke whale (Celtic and Greater North Seas MU), GS = grey seal (East Rol and Northern Ireland MU), HS = harbour seal (East Rol and Northern Ireland MU).

Development	Distance from the array site (km)	Distance from the export cable corridor (km)	Tier	HP	BND	CD, RD, MW	GS, HS
Arklow Bank Wind Park 2	9.3	17.6	1	yes	yes	yes	yes
Dublin Array	2.8	0.0	1	yes	yes	yes	yes
North Irish Sea Array	51.0	35.7	1	yes	yes	yes	yes
Oriel	83.9	61.6	1	yes	yes	yes	yes
Mona	125.1	128.7	1	yes	yes	yes	no
Awel y Môr	129.4	133.3	1	yes	yes	yes	no
Morgan	141.2	143.9	1	yes	yes	yes	no
Isle of Man (Moor Vannin)	154.2	156.7	1	yes	yes	yes	yes
Morecambe	154.4	157.9	1	yes	yes	yes	no
Erebus Floating Wind Demo	167.9	173.9	1	yes	no	yes	no
Celtic Seas Round 5 PDA1 (Gwynt Glas)	175.3	181.1	3	yes	no	yes	no
North Channel Wind 2	177.6	162.7	3	yes	yes	yes	yes
Llŷr 1	181.5	187.8	1	yes	no	yes	no
Llŷr 2	183.8	190.4	3	yes	no	yes	no
North Channel Wind 1	202.1	183.9	3	yes	yes	yes	yes
White Cross	207.5	213.9	1	yes	no	yes	no
Machair	302.2	277.5	3	no	no	yes	no
Forthwind	379.8	373.2	1	no	no	yes	no
Berwick Bank	426.1	424.8	1	no	no	yes	no
Inch Cape	430.6	425.9	1	no	no	yes	no
Rampion 2	439.2	446.2	1	no	no	yes	no
Outer Dowsing	449.8	453.7	1	no	no	yes	no

Development	Distance from the array site (km)	Distance from the export cable corridor (km)	Tier	HP	BND	CD, RD, MW	GS, HS
Dudgeon Extension	460.5	464.3	1	no	no	yes	no
Parc éolien posé au large de la Normandie (AO4)	477.5	485.0	3	no	no	yes	no
Centre-Manche 1	481.1	488.6	1	no	no	yes	no
Centre-Manche 2	488.1	495.5	3	no	no	yes	no
Morven	490.1	490.2	2	no	no	yes	no
Dogger Bank South (West)	492.4	496.2	1	no	no	yes	no
Bowdun	502.4	498.1	2	no	no	yes	no
Saint-Brieuc	504.9	512.4	1	no	no	yes	no
Ossian	509.5	510.2	1	no	no	yes	no
Dogger Bank - Creyke Beck A	515.6	519.3	1	no	no	yes	no
Dogger Bank South (East)	516.7	520.5	1	no	no	yes	no
Courseulles-sur-mer	528.8	536.5	1	no	no	yes	no
Hornsea Project Three	533.3	537.4	1	no	no	yes	no
North Falls	533.4	538.4	1	no	no	yes	no
Fécamp	535.1	542.3	1	no	no	yes	no
East Anglia Two	537.1	541.3	1	no	no	yes	no
Norfolk Vanguard West	538.6	542.2	1	no	no	yes	no
Bellrock	541.4	541.3	3	no	no	yes	no
Five Estuaries	542.9	547.5	1	no	no	yes	no
East Anglia One North	544.4	548.4	1	no	no	yes	no
Dogger Bank - Teesside B (Sofia)	544.8	548.4	1	no	no	yes	no
Moray West	564.8	551.7	1	no	no	yes	no
Dieppe Le Tréport	565.6	572.4	1	no	no	yes	no
Norfolk Boreas	567.7	571.3	1	no	no	yes	no
Norfolk Vanguard East	569.6	573.1	1	no	no	yes	no
East Anglia Three	571.0	574.5	1	no	no	yes	no
Muir Mhòr	572.2	568.2	1	no	no	yes	no
Salamander	572.4	566.4	1	no	no	yes	no

Development	Distance from the array site (km)	Distance from the export cable corridor (km)	Tier	HP	BND	CD, RD, MW	GS, HS
Campion	576.1	575.1	3	no	no	yes	no
Caledonia	580.2	569.5	1	no	no	yes	no
Sporad na Mara	580.6	557.1	3	no	no	yes	no
Dogger Bank C - Teesside A	580.7	584.4	1	no	no	yes	no
Cedar	584.6	586.7	3	no	no	yes	no
Broadshore	605.8	596.3	3	no	no	yes	no
Aspen	608.1	604.2	1	no	no	yes	no
IJmuiden Ver	608.1	611.6	1	no	no	yes	no
IJmuiden Ver 2021 – Y-VER	608.1	611.6	3	no	no	yes	no
Borssele Kavel V	610.4	615.2	1	no	no	yes	no
Green Volt	611.6	605.9	1	no	no	yes	no
Hollandse Kust F	612.3	616.6	1	no	no	yes	no
Scaraben	618.4	609.1	3	no	no	yes	no
Sinclair	619.9	610.3	3	no	no	yes	no
Talisk	622.0	599.5	3	no	no	yes	no
Pentland Floating	623.0	607.0	1	no	no	yes	no
Cenos	625.5	627.6	3	no	no	yes	no
Marram	626.5	620.0	3	no	no	yes	no
Stromar	627.5	616.6	3	no	no	yes	no
Havbredey	628.3	606.9	3	no	no	yes	no
HKW Kavel VII	628.3	631.8	1	no	no	yes	no
HKW Noord – HKW-N	628.3	631.8	3	no	no	yes	no
Hollandse Kust (West)	630.6	634.6	1	no	no	yes	no
West of Orkney	633.0	615.2	3	no	no	yes	no
Buchan	634.9	626.7	3	no	no	yes	no
HKW Kavel VI	636.5	640.0	1	no	no	yes	no
Sud de la Bretagne	639.5	646.3	3	no	no	yes	no
Harbour Energy North	644.8	647.8	3	no	no	yes	no

Development	Distance from the array site (km)	Distance from the export cable corridor (km)	Tier	HP	BND	CD, RD, MW	GS, HS
Harbour Energy South	644.8	647.8	3	no	no	yes	no
HKZ Kavel II	656.3	660.2	1	no	no	yes	no
HKZ Kavel I	659.4	663.3	1	no	no	yes	no
HKZ Kavel III	659.4	663.3	1	no	no	yes	no
Culzean	662.5	665.0	3	no	no	yes	no
Ayre	664.1	651.7	3	no	no	yes	no
Beech	696.3	695.9	3	no	no	yes	no
Iles d'Yeu et de Noirmoutier	711.1	718.2	1	no	no	yes	no
Ten Noorden van de Wadden	731.5	735.5	3	no	no	yes	no
N-9.3	754.7	758.7	3	no	no	yes	no
N-9.1	760.4	764.4	3	no	no	yes	no
N-9.4	764.5	468.4	3	no	no	yes	no
N-6.7	766.0	770.0	3	no	no	yes	no
N-6.6	772.9	776.9	3	no	no	yes	no
N-9.2	773.4	777.3	3	no	no	yes	no
N-10.2	780.1	784.0	3	no	no	yes	no
Nordsren III vest	786.7	790.3	3	no	no	yes	no
Borkum Riffgrund 3	787.4	791.4	1	no	no	yes	no
N-10.1	789.4	793.3	3	no	no	yes	no
N-7.2	791.8	795.8	3	no	no	yes	no
EnBW He Dreiht	793.0	797.0	1	no	no	yes	no
OWP West (new Borkum Riffgrund expansion)	797.2	793.2	1	no	no	yes	no
Nordsren II vest	809.1	812.7	3	no	no	yes	no
N-3.6	830.9	834.9	3	no	no	yes	no
Sud Atlantique	833.8	841.0	3	no	no	yes	no
N-3.5	835.1	839.2	3	no	no	yes	no
N-3.8	836.1	840.1	3	no	no	yes	no
Arven	842.0	831.1	3	no	no	yes	no

Development	Distance from the array site (km)	Distance from the export cable corridor (km)	Tier	HP	BND	CD, RD, MW	GS, HS
Nordsren III	846.8	850.3	3	no	no	yes	no
N-3.7	848.7	852.8	3	no	no	yes	no
Gode Wind 3	851.6	855.7	1	no	no	yes	no
Nordsøen I	864.4	868.1	3	no	no	yes	no
Stoura	880.0	869.4	3	no	no	yes	no
Thor	911.4	915.0	1	no	no	yes	no
Fanm Bugt	925.3	929.2	3	no	no	yes	no
Jammerland Bay Nearshore Wind Farm	1112.3	1116.1	3	no	no	yes	no
Kattegat II	1138.8	1142.5	3	no	no	yes	no
Poseidon	1171.4	1174.7	1	no	no	yes	no
Hesselk	1174.4	1178.1	3	no	no	yes	no
Galatea-Galene	1194.4	1197.9	1	no	no	yes	no
Kattegat Syd	1198.2	1201.8	1	no	no	yes	no
Kattegatt Offshore	1221.8	1225.4	1	no	no	yes	no

Table 9-3 Summary of other offshore developments screened into the CEA for Marine Mammals

All included due to the potential for construction activities between 2025-2036. HP = harbour porpoise (Celtic and Irish Sea MU), BND = bottlenose dolphin (Irish Sea MU), CD = common dolphin (Celtic and Greater North Seas MU), RD = Risso's dolphin (Celtic and Greater North Seas MU), MW = minke whale (Celtic and Greater North Seas MU), GS = grey seal (East RoI and Northern Ireland MU), HS = harbour seal (East RoI and Northern Ireland MU).

Type	Development	Distance from the array site (km)	Distance from the export cable corridor (km)	Tier	HP	BND	CD, RD, MW	GS, HS
Subsea Cables	Mares Connect	43.2	19.6	3	yes	yes	yes	yes
Subsea Cables	LirIC Interconnector Project	179.1	160.3	3	yes	yes	yes	yes
Other offshore Energy - Tidal	Holyhead Deep	64.2	68.1	1	yes	yes	yes	no
Other offshore Energy - Tidal	West Anglesey Demonstration Zone	69.8	65.8	1	yes	yes	yes	no
Other offshore Energy - Wave	Pembrokeshire Demonstration Zone	181.7	174.9	3	yes	no	yes	no
Other offshore Energy - Tidal	Fair Head Phase 1	267.1	244.7	1	no	no	yes	yes
Other offshore Energy - Tidal	Perpetuus Tidal Energy Centre (PTEC)	416.3	408.9	1	no	no	yes	no
Other offshore Energy - Tidal	Raz Blanchard	451.4	465.0	1	yes	no	yes	no
Other offshore Energy - Tidal	Morlais Orbital O2	691.5	676.6	1	yes	yes	yes	no
Coastal Assets	Dublin Port Company MP2 Project	25.1	4.2	1	yes	yes	yes	yes
Coastal Assets	Arklow Bank Wind Park 2 Operations and Maintenance Facility Onshore and Nearshore infrastructure and associated works	30.8	33.1	1	yes	yes	yes	yes
Coastal Assets	Dublin Port Masterplan (3FM Plan)	31.3	0.6	1	yes	yes	yes	yes
Coastal Assets	Dublin Port maintenance dredging	32.2	0.8	1	yes	yes	yes	yes

Type	Development	Distance from the array site (km)	Distance from the export cable corridor (km)	Tier	HP	BND	CD, RD, MW	GS, HS
Coastal Assets	Greater Dublin Drainage Project consisting of a new wastewater treatment plant, sludge hub centre, orbital sewer, outfall pipeline and regional biosolids storage facility	33.1	9.9	1	yes	yes	yes	yes
Coastal Assets	Maintenance dredging River Boyne, Dogheda	69.1	42.7	1	yes	yes	yes	yes
Survey	Codling Wind Park Ltd. Site Investigations for proposed Offshore Wind Farm, off Counties Wicklow and Dublin	3.8	19.5	1	yes	yes	yes	yes
Survey	Sure Partners Arklow Bank Wind Park Phase 2 Site Investigations	10.2	16.7	1	yes	yes	yes	yes
Survey	Environmental survey and ground investigation works in order to inform the design of proposed Point Bridge and Tom Clarke Widening Project.	34.3	1.7	1	yes	yes	yes	yes
Survey	Moneypoint Generating Station site to inform the engineering design of the proposed Moneypoint Hub Project. The marine surveys will include geophysical, geotechnical, environmental, and met ocean surveys.	34.3	1.7	1	yes	no	yes	no
Survey	Geophysical survey and site investigations for a proposed subsea fibre optic cable having a landfall in Portmarnock, County Dublin to evaluate options for the route traversing the Irish Sea to Abergele, Wales.	36.3	9.5	1	yes	yes	yes	yes
Survey	Site investigation activities to inform the development of the North Irish Sea Array (NISA) offshore windfarm (OWF) and export cable, off the coasts of counties Dublin, Meath and Louth.	62.0	41.7	1	yes	yes	yes	yes
Survey	MaresConnect Electricity Interconnector Site Investigation	59.8	32.9	1	yes	yes	yes	yes
Survey	Statkraft North Irish Sea Array (NISA) Site Investigations for Export Cable Route	61.9	41.3	1	yes	yes	yes	yes
Survey	North Irish Sea Array (NISA) Site Investigations	62.0	41.7	1	yes	yes	yes	yes
Survey	Braymore Point Site Investigations	81.8	55.7	1	yes	yes	yes	yes
Survey	Oriel Windfarm Ltd Site Investigations	84.4	61.1	3	yes	yes	yes	yes
Survey	Geotechnical investigation required to support the design of a proposed 250m Offshore Renewable Energy (ORE) capable quay extension in the River Suir at the Port of Waterford, Belview, Co. Kilkenny	114.9	115.7	1	yes	yes	yes	yes
Survey	Geophysical survey and site investigations for a proposed subsea fibre optic cable having a landfall in Dublin Port, County Dublin and to evaluate options	121.2	124.6	1	yes	yes	yes	yes

Type	Development	Distance from the array site (km)	Distance from the export cable corridor (km)	Tier	HP	BND	CD, RD, MW	GS, HS
	for the route traversing Dublin Bay, across the Irish Sea to Anglesey, Wales.							
Survey	TwinHub Floating Offshore Wind Project - Site Investigations. Offshore site investigation works for floating OWF demonstrator.	191.4	181.2	1	yes	no	yes	no
Survey	Site investigation to support the preliminary and detailed engineering design of the deep water terminal development on Foynes island.	225.2	210.8	1	yes	no	yes	no
Survey	Geotechnical Surveys in the Celtic Sea	282.3	249.7	1	yes	no	yes	no
Survey	Mona Offshore Wind Farm 2024 Deep Geotechnical Survey	282.3	249.7	1	yes	yes	yes	no
Survey	Mona Offshore Wind Farm Geotechnical Survey	282.3	249.7	1	yes	yes	yes	no
Survey	Tuskar Subsea Fibre Optic Cable - Geophysical survey and site investigations	104.9	110.9	1	yes	yes	yes	yes
Survey	SOBR1 Subsea Fibre Optic Cable - Geophysical survey and site investigations	27.0	1.1	1	yes	yes	yes	yes
Survey	SOBR2 Subsea Fibre Optic Cable - Geophysical survey and site investigations	35.0	10.9	1	yes	yes	yes	no
Carbon Capture Storage	HyNet North West Industrial Cluster & Liverpool Bay CO ₂ Storage (CS004A/B)	148.1	152.0	1	yes	yes	yes	yes
Carbon Capture Storage	East Coast Cluster & Northern Endurance CO ₂ Storage (CS001, CS006, CS007)	484.9	488.8	1	no	no	yes	no
Carbon Capture Storage	Viking CCS Project (CS005)	519.0	522.8	1	no	no	yes	no
Carbon Capture Storage	Acorn CCS / Scottish Cluster (CS011, CS012, CS003)	687.9	684.1	1	no	no	yes	no

9.5 Stage 4: Assessment of cumulative effects

9.5.1 Construction phase

Cumulative Impact 1: Disturbance from pre-construction surveys

341. There is the possibility that all offshore development may conduct pre-construction geophysical surveys and site investigations. Therefore, all OWF projects in **Table 9-2** and other offshore developments in **Table 9-3** are considered here, however it is noted that only the “Survey” projects listed in **Table 9-3** have any information on potential survey timelines. There are 14 other survey projects that are planned to be surveying between 2025-2028 when CWP is expecting to be conducting site investigations (**Table 9-4**).
342. The number of animals predicted to be disturbed by geophysical surveys has been assessed using the guidance in JNCC (2025) which recommends a 3 km EDR is used to assess significant disturbance to harbour porpoise from SBPs, USBLs, and Multiple-transducer SBES or MBES with an operating frequency of ≤ 12 kHz operating in waters ≤ 200 m depth. In the absence of guidance for other species and for other equipment types (SBI, SSS, UHRS), the same 3 km EDR is assumed for all marine mammals for all geophysical survey equipment.
343. Given the small disturbance ranges expected from geophysical surveys, this CEA considers only survey activities in the Irish Sea that are expected to occur between 2025-2028 when CWP is conducting survey activities (Table 0.5). At CWP alone, using a 3 km EDR (with the SCANS IV block density for cetaceans and the average array area and ECC density for seals), there was predicted to be impact to:
- 8 harbour porpoise (0.01% MU)
 - 7 bottlenose dolphins (0.08% MU)
 - 1 common dolphin (0.00% MU)
 - 4 grey seals (0.07% MU)
 - (Note: Risso’s dolphins, minke whales and harbour seals were screened out since < 1 individual was predicted to be disturbed at CWP alone. Therefore, there is no potential for CWP to contribute to a cumulative effect).
344. Similar numbers are expected to be impacted at other geophysical surveys in the Irish Sea.
345. It is anticipated that the noise emitted from geophysical survey equipment will be rapidly attenuated with distance from source such that noise levels at which behavioural disturbance would be anticipated to occur will be of small spatial extent. In particular, it is noted that those sources with higher source levels (SBP, UHRS), along with the SBI, are highly directional, with noise levels outside of the main beam considerably lower and therefore with limited horizontal propagation of noise levels. The consequence of the impact is short-term, intermittent over the course of a geophysical survey campaigns, with temporary behavioural effects. It is predicted that any disturbance arising from the geophysical survey works will be of localised spatial extent but could occur intermittently across 2025-2028. The effect is likely to occur but at low frequency. Although the effect could affect a very small proportion of the receptor populations, population trajectories are unlikely to be altered. Therefore, the magnitude of behavioural disturbance due to geophysical surveys has been assessed as **Low**.
346. As per the project alone assessment, the sensitivity of marine mammals to disturbance from pre-construction geophysical surveys is **Low**.
347. Therefore, the overall significance of the cumulative impact for Tier 1, Tier 2 and Tier 3 combined is **Minor (not significant)**.

Table 9-4 Offshore survey projects screened into the CEA.

Key: **Planning**, **Construction/Activity**, **Inactive**

Survey Project	Tier	2025	2026	2027	2028
Codling Wind Park Ltd. Site Investigations for proposed Offshore Wind Farm, off Counties Wicklow and Dublin	1				
Sure Partners Arklow Bank Wind Park Phase 2 Site Investigations	1				
Environmental survey and ground investigation works in order to inform the design of proposed Point Bridge and Tom Clarke Widening Project.	1				
Site investigation activities to inform the development of the North Irish Sea Array (NISA) offshore windfarm (OWF) and export cable, off the coasts of counties Dublin, Meath and Louth.	1				
MaresConnect Electricity Interconnector Site Investigation	1				
Statkraft North Irish Sea Array (NISA) Site Investigations for Export Cable Route	1				
North Irish Sea Array (NISA) Site Investigations	1				
Braymore Point	1				
Oriel Windfarm Ltd	3				
Geophysical survey and site investigations for a proposed subsea fibre optic cable having a landfall in Dublin Port, County Dublin and to evaluate options for the route traversing Dublin Bay, across the Irish Sea to Anglesey, Wales.	1				
Mona Offshore Wind Farm 2024 Deep Geotechnical Survey	1				
Mona Offshore Wind Farm Geotechnical Survey	1				
Tuskar Subsea Fibre Optic Cable - Geophysical survey and site investigations	1				
SOBR1 Subsea Fibre Optic Cable - Geophysical survey and site investigations	1				
SOBR2 Subsea Fibre Optic Cable - Geophysical survey and site investigations	1				

Cumulative Impact 2: Disturbance from UXO clearance

348. There is the potential for all offshore developments to have to clear UXOs during the construction phase. However, it is expected that all Projects will use low-order deflagration as the primary UXO clearance method. This aligns with the advice provided in the joint interim position statement released in 2022 by Department for Business, Energy and Industrial Strategy (BEIS), the Marine Management Organisation (MMO), the Joint Nature Conservation Committee (JNCC), Natural England (NE) the Offshore Petroleum Regulator for Environment and Decommissioning (OPRED), the Department of Agriculture, Environment and Rural Affairs (DAERA), NatureScot, Marine Scotland, Natural Resources Wales, and aligns with feedback received on Irish projects.
349. Given the small disturbance ranges expected from low-order UXO clearance, this CEA considers only UXO clearance activities in the Irish Sea that are expected to occur between 2031-2033 when CWP is conducting offshore construction activities.
350. There are seven other offshore developments that are expected to be constructing at the same time as CWP (2031-2033) in the Irish Sea. Using a 5 km EDR (with the SCANS IV block density for cetaceans and the average array area and ECC density for seals), there is predicted to be impact to:
- 194 harbour porpoise in 2031 (0.3% MU) (**Table 9-5**)
 - 127 bottlenose dolphins in 2031 (1.5% MU) (**Table 9-6**)
 - 14 common dolphins in 2031 (0.0% MU) (**Table 9-7**)
 - 116 grey seals in 2031 (1.9% MU) (**Table 9-8**)
 - (Note: Risso's dolphins, minke whales and harbour seals were screened out since <1 individual was predicted to be disturbed at CWP alone.
351. Therefore, there is no potential for CWP to contribute to a cumulative effect, if each project conducts UXO clearance on the same day as CWP (which is very highly unlikely).

352. It is expected that the detonation of a UXO would elicit a startle response and potentially very short duration behavioural responses and would therefore not be expected to cause widespread and prolonged displacement (JNCC, 2020). Given the very small percentage of the MUs predicted to be impacted per UXO clearance event, and the fact the consequence of the impact is likely to be short-term, intermittent during a UXO clearance campaign, and with temporary behavioural effects that are very unlikely to affect the survival and reproductive rates to the extent that the population trajectory would be altered, disturbance effects associated with low-order UXO clearance even cumulatively across Projects is assessed as **Low** magnitude.
353. As per the project alone assessment, the sensitivity of marine mammals to disturbance from UXO clearance is expected to be **Low**.
354. Therefore, the overall significance of the cumulative impact for Tier 1, Tier 2, and Tier 3 combined is **Minor (not significant)**.

Table 9-5 Number of harbour porpoise disturbed by a low-order UXO clearance event in the Irish Sea (5 km EDR + SCANS IV block density).

Key: Construction, Operation

Project	Tier	Project Type	Region	2031	2032	2033
CWP		OWF	Ireland	22	22	22
Arklow Bank Wind Park 2	1	OWF	Ireland	22		
Dublin Array	1	OWF	Ireland	22	22	22
Isle of Man (Moor Vannin)	1	OWF	Isle of Man	40		
Dublin Port Company MP2 Project	1	Coastal Assets	Ireland	22	22	
Arklow Bank Wind Park 2 Operations and Maintenance Facility Onshore and Nearshore infrastructure and associated works	1	Coastal Assets	Ireland	22		
Dublin Port Masterplan (3FM Plan)	1	Coastal Assets	Ireland	22	22	22
Greater Dublin Drainage Project consisting of a new wastewater treatment plant, sludge hub centre, orbital sewer, outfall pipeline and regional biosolids storage facility	1	Coastal Assets	Ireland	22	22	22
CWP + Tier 1 + 2 + 3			Total	194	110	88
			%MU	0.3%	0.2%	0.1%

Table 9-6 Number of bottlenose dolphins disturbed by a low-order UXO clearance event in the Irish Sea (5 km EDR + SCANS IV block density).

Key: Construction, Operation

Project	Tier	Project Type	Region	2031	2032	2033
CWP		OWF	Ireland	18	18	18
Arklow Bank Wind Park 2	1	OWF	Ireland	18		
Dublin Array	1	OWF	Ireland	18	18	18
Isle of Man (Moor Vannin)	1	OWF	Isle of Man	1		
Dublin Port Company MP2 Project	1	Coastal Assets	Ireland	18	18	
Arklow Bank Wind Park 2 Operations and Maintenance Facility Onshore and Nearshore infrastructure and associated works	1	Coastal Assets	Ireland	18		
Dublin Port Masterplan (3FM Plan)	1	Coastal Assets	Ireland	18	18	18
Greater Dublin Drainage Project consisting of a new wastewater treatment plant, sludge hub centre, orbital sewer, outfall pipeline and regional biosolids storage facility	1	Coastal Assets	Ireland	18	18	18
CWP + Tier 1 + 2 + 3			Total	127	90	72
			%MU	1.5%	1.1%	0.9%

Table 9-7 Number of common dolphins disturbed by a low-order UXO clearance event in the Irish Sea (5 km EDR + SCANS IV block density).

Key: Construction, Operation

Project	Tier	Project Type	Region	2031	2032	2033
CWP		OWF	Ireland	2	2	2
Arklow Bank Wind Park 2	1	OWF	Ireland	2		
Dublin Array	1	OWF	Ireland	2	2	2
Isle of Man (Moor Vannin)	1	OWF	Isle of Man	0		
Dublin Port Company MP2 Project	1	Coastal Assets	Ireland	2	2	
Arklow Bank Wind Park 2 Operations and Maintenance Facility Onshore and Nearshore infrastructure and associated works	1	Coastal Assets	Ireland	2		
Dublin Port Masterplan (3FM Plan)	1	Coastal Assets	Ireland	2	2	2
Greater Dublin Drainage Project consisting of a new wastewater treatment plant, sludge hub centre, orbital sewer, outfall pipeline and regional biosolids storage facility	1	Coastal Assets	Ireland	2	2	2
CWP + Tier 1 + 2 + 3			Total	14	10	8
			%MU	0.0%	0.0%	0.0%

Table 9-8 Number of grey seals disturbed by a low-order UXO clearance event in the Irish Sea (5 km EDR + habitat preference map density).

Key: Construction, Operation

Project	Tier	Project Type	Region	2031	2032	2033
CWP		OWF	Ireland	1	1	1
Arklow Bank Wind Park 2	1	OWF	Ireland	0		
Dublin Array	1	OWF	Ireland	1	1	1
Isle of Man (Moor Vannin)	1	OWF	Isle of Man	1		
Dublin Port Company MP2 Project	1	Coastal Assets	Ireland	37	37	
Arklow Bank Wind Park 2 Operations and Maintenance Facility Onshore and Nearshore infrastructure and associated works	1	Coastal Assets	Ireland	2		
Dublin Port Masterplan (3FM Plan)	1	Coastal Assets	Ireland	37	37	37
Greater Dublin Drainage Project consisting of a new wastewater treatment plant, sludge hub centre, orbital sewer, outfall pipeline and regional biosolids storage facility	1	Coastal Assets	Ireland	37	37	37
CWP + Tier 1 + 2 + 3			Total	116	113	76
			%MU	1.9%	1.9%	1.3%

Cumulative Impact 3: Disturbance from piling – WTGs and OSSs

Method - Phase 1 Projects

355. Population modelling was conducted for the five Phase 1 Irish OWF projects, to determine if disturbance from piling activities would result in impacts at a population level. Two approaches were used in this assessment:
 - EIA predictions
 - Standardized mitigated predictions
356. The first method used the number of animals predicted to be disturbed by pile driving activities within each submitted Phase 1 EIA. The issues with this approach are as follows:
 - Different projects used different density estimates for different species which are not compatible with each other; and

- EIAs for Arklow, Oriel and NISA did not assume any noise reduction for piling, which is unlikely to occur due to the request in FIRs for noise abatement methods to be implemented at these projects.

357. Therefore, a second method is presented which is more standardised. This assessment assumes all Phase 1 Projects will use noise abatement for pile driving and an EDR of 11 km is assumed for mitigated piling at each project. To standardise the density estimates used, all cetacean species assessments used the species-specific SCANS IV block CS-D density estimate.

358. Both methods have assumed that there is a 12 month delay in construction programmes for each Phase 1 project compared to the programmes published in their EIARs. This means the following schedule is assumed:

- Oriel piling in 2028
- Arklow and NISA piling in 2029
- Dublin Array piling in 2030, 2031 and/ or 2032
- Codling piling in 2031.

Method – Cumulative OWF in MUs

359. A key assumption made throughout this CEA for OWF in English and Welsh waters, and more broadly is for the implementation of noise reduction. This is based on, inter alia, DEFRA Guidance² which notes that *“From January 2025, given the expected increase in noise levels over the coming years, and the above outlined policy commitments, we expect that all offshore wind pile driving activity across all English waters will be required to demonstrate that they have utilised best endeavours to deliver noise reductions through the use of primary and/or secondary noise reduction methods in the first instance.”*

Harbour Porpoise - Phase 1 Projects

360. The assessment of the Phase 1 OWF is presented using both the EIAR values and assumed mitigated piling using an 11 km EDR (**Table 9-9**).

361. The iPCoD results show that the level of disturbance predicted under either method is not sufficient to result in any changes to the harbour porpoise population, since the impacted population is predicted to continue at a stable trajectory at >99.9% of the size of the unimpacted population (**Plate 9-1** and **Table 9-10**). The effect of disturbance from a single piling event is expected to last less than a day, though the disturbance impact across the five projects will occur intermittently across 5 years. This is expected to result in short-term and / or intermittent and temporary behavioural effects in a small proportion of the population. It is expected that the temporary changes in behaviour and/or distribution of individuals are at a scale that would result in potential reductions to lifetime reproductive success and survival rates to some individuals, but not enough to affect the population trajectory over the long term. This is therefore a **Medium** magnitude.

362. As per the project alone assessment, the sensitivity of porpoise to pile driving of WTG is **Low**.

363. Therefore, the overall significance of the cumulative effect is **Minor (not significant)**.

² DEFRA 2025 Policy paper [Reducing marine noise](#)

Table 9-9 Number of harbour porpoise disturbed per piling day at the Phase 1 OWFs.

Key: Planning, Construction, Operation

OWF	Density used	Disturbance	Piling Days	2028	2029	2030	2031	2032

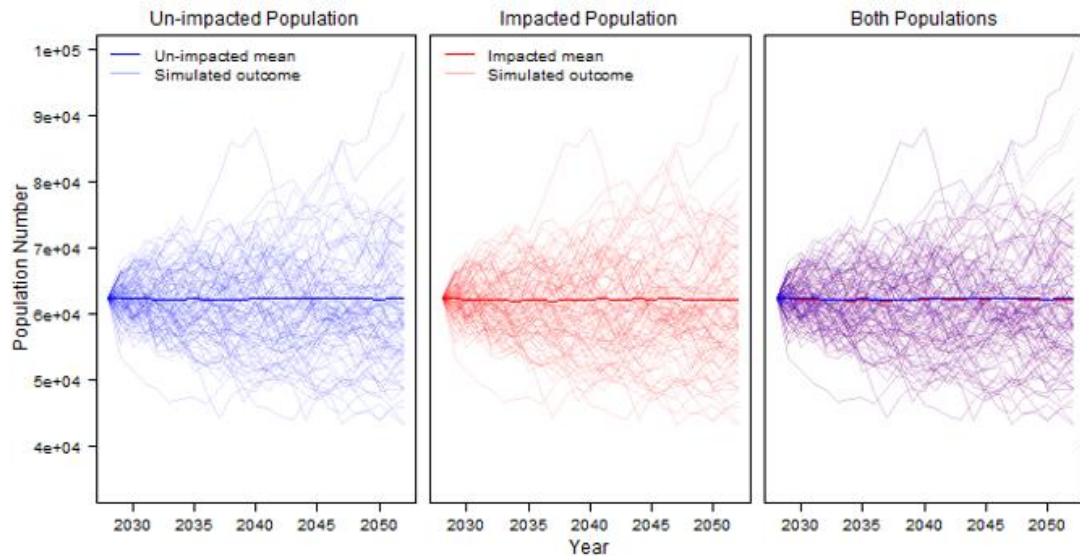
Values from the project specific EIAs

CWP	grid cell specific (Irish Sea surface)	Dose-response	78				668	
Arklow	0.38 (Arklow DAS)	Dose-response	79		3380			
NISA	0.38 (NISA DAS)	Dose-response	51		3896			
Oriel	1.33 (Oriel DAS)	Dose-response	26	725				
Dublin	grid cell specific (Irish Sea surface)	Dose-response	125			995	995	995

Values using an 11 km EDR for mitigated piling and SCANS IV Block CS-D density

CWP	0.2803	11 km EDR	78				107	
Arklow	0.2803	11 km EDR	79		107			
NISA	0.2803	11 km EDR	51		107			
Oriel	0.2803	11 km EDR	26	107				
Dublin	0.2803	11 km EDR	125			107	107	107

Values from the project specific EIAs



Values using an 11 km EDR and SCANS IV Block CS-D density

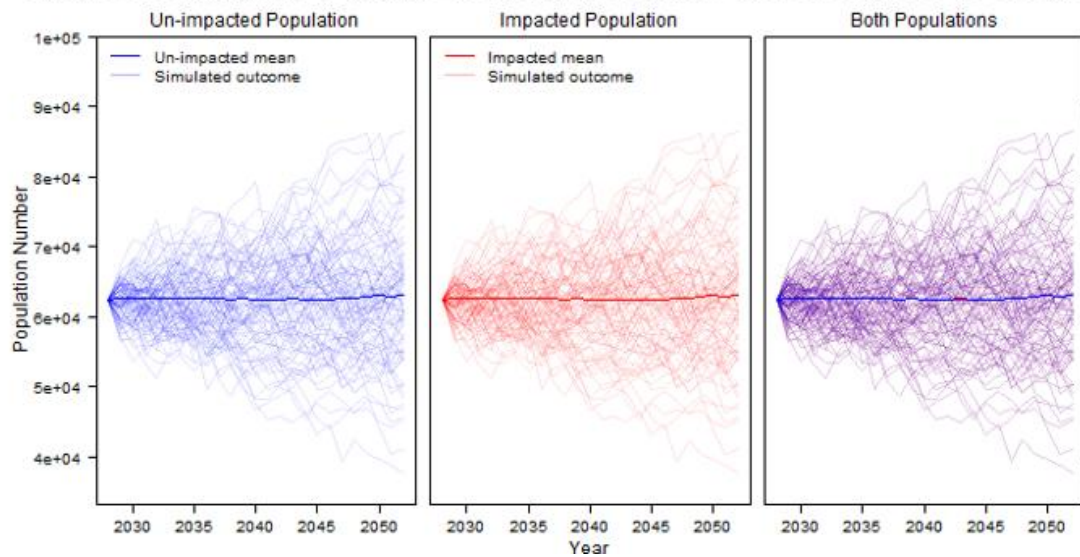


Plate 9-1 Harbour porpoise predicted population trajectories

Modelled unimpacted population (left), the modelled impacted population (middle) and together (right) for disturbance from the Phase 1 OWFs using values of disturbance from project specific EIAs (top) and using an 11 km EDR for mitigated piling and the SCANS IV density (bottom)

Table 9-10 Predicted mean population size for the un-impacted (baseline) and impacted harbour porpoise iPCoD CEA Phase 1 simulation

Year	Unimpacted population size (mean)	Impacted population size (mean)	Impacted population size (mean) as % of unimpacted population size (mean)
Values from the project specific EIAs			
Start 2028 (before CEA piling)	62,516	62,516	100.00%
End 2032 (end of CEA piling)	62,275	62,068	99.67%
End 2038 (6 yr after CEA piling ends)	62,255	62,089	99.73%
End 2044 (12 yr after CEA piling ends)	62,411	62,245	99.73%
End 2050 (18 yr after CEA piling ends)	62,429	62,263	99.73%
Values using an 11 km EDR for mitigated piling and SCANS IV Block CS-D density			
Start 2028 (before CEA piling)	62,516	62,516	100.00%
End 2032 (end of CEA piling)	62,744	62,736	99.99%
End 2038 (6 yr after CEA piling ends)	62,595	62,589	99.99%
End 2044 (12 yr after CEA piling ends)	62,486	62,480	99.99%
End 2050 (18 yr after CEA piling ends)	62,906	62,900	99.99%

Harbour Porpoise - Cumulative OWF in Celtic & Irish Sea MU

364. The harbour porpoise cumulative assessment for disturbance from WTG pile driving across the Celtic & Irish Sea MU screened in 16 OWF in addition to CWP. Given that it is expected OWFs constructing in English, Welsh and Irish waters will likely implement noise reduction measures, the assessment was standardised assuming an 11 km EDR for mitigated pile driving for each OWF and using the relevant SCANS IV block density.
365. For Tier 1, there were 12 OWFs screened in, in addition to CWP, resulting in OWF pile driving between 2025 and 2032 (**Table 9-11**). The maximum predicted impact is expected to occur in 2028 when six Tier 1 OWFs are expected to be piling, where the predicted impact is to 896 porpoise per piling day (1.4% MU). In 2031 when CWP is piling, there is expected to be piling at only two other Tier 1 projects, where the predicted impact is to 409 porpoise per piling day (0.7% MU, CWP contributes 26% of this total).
366. For Tier 1-3, there were 16 OWFs screened in, in addition to CWP, resulting in OWF pile driving between 2025 and 2036 (**Table 9-11**). The maximum predicted impact is expected to occur in 2028 when nine Tier 1-3 OWFs are expected to be piling, where the predicted impact is to 1,115 porpoise per piling day (1.8% MU). In 2031 when CWP is piling, there is expected to be piling at only four other Tier 1-3 projects, where the predicted impact is to 623 porpoise per piling day (1.0% MU, CWP contributes 17% of this total).
367. The effect of disturbance from a single piling event is expected to last less than a day, though the disturbance impact across the cumulative Tier 1-3 projects will occur intermittently across 12 years. This is expected to result in short-term and / or intermittent and temporary behavioural effects in a small proportion of the population. It is expected that the temporary changes in behaviour and/or distribution of individuals are at a scale that would result in potential reductions to lifetime reproductive success and survival rates to some individuals, but not enough to affect the population trajectory over the long term. This is therefore a **Medium** magnitude.

368. As per the project alone assessment, the sensitivity of porpoise to pile driving of WTG is **Low**.

369. Therefore, the overall significance of the cumulative effect is **Minor (not significant)**.

Table 9-11 Harbour porpoise cumulative assessment for disturbance from OWF pile driving in the Celtic & Irish Sea MU.

Key: **Planning**, **Construction**, **Operation**

OWF	Tier	EDR (km)	SCANS IV block	Density (#/km ²)	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
CWP		11	CS-D	0.2803							107					
Arklow Bank Wind Park 2	1	11	CS-D	0.2803					107							
Dublin Array	1	11	CS-D	0.2803						107	107	107				
North Irish Sea Array	1	11	CS-D	0.2803					107							
Oriel	1	11	CS-D	0.2803				107								
Mona	1	11	CS-E	0.5153	196	196	196	196								
Awel y Môr	1	11	CS-E	0.5153	196	196	196									
Morgan	1	11	CS-E	0.5153	196	196	196	196								
Isle of Man (Moor Vannin)	1	11	CS-E	0.5153				196	196	196	196					
Morecambe	1	11	CS-E	0.5153			196	196	196	196						
Erebus Floating Wind Demo	1	11	CS-C	0.0157	6	6										
Llŷr 1	1	11	CS-C	0.0157			6	6	6							
White Cross	1	11	CS-C	0.0157	6	6	6									
Celtic Seas Round 5 PDA1 (Gwynt Glas)	3	11	CS-C	0.0157								6	6	6	6	6
North Channel Wind 2	3	11	CS-D	0.2803				107	107	107	107					
Llŷr 2	3	11	CS-C	0.0157			6	6	6							
North Channel Wind 1	3	11	CS-D	0.2803				107	107	107	107					
CWP + Tier 1				Total	600	600	796	896	611	498	409	107	0	0	0	0
				%MU	1.0	1.0	1.3	1.4	1.0	0.8	0.7	0.2	0.0	0.0	0.0	0.0
CWP + Tier 1 + 2 + 3				Total	600	600	802	1115	830	711	623	113	6	6	6	6
				%MU	1.0	1.0	1.3	1.8	1.3	1.1	1.0	0.2	0.0	0.0	0.0	0.0

Bottlenose dolphin - Phase 1 Projects

370. The assessment of the Phase 1 OWF is presented using both the EIAR values and assumed mitigated piling using an 11 km EDR (Table 9-14).

EIA Value

371. Using the EIA values, the iPCoD results show that the level of disturbance predicted is sufficient to result in small changes to the bottlenose dolphin population, since the impacted population is predicted to continue at a stable trajectory at ~96-97% of the size of the unimpacted population (**Plate 9-2** and **Table 9-13**). It is noted that iPCoD does not currently allow for a density-dependent response, and as such there is no way for the impacted population to increase in size after the piling disturbance. The impacted population does, however, continue on a stable trajectory in the long-term. The effect of disturbance from a single piling event is expected to last less than a day, though the disturbance impact across the five projects will occur intermittently across 5 years. This is expected to result in short-term and / or intermittent and temporary behavioural effects in a small proportion of the population. It is expected that the temporary changes in behaviour and/or distribution of individuals are at a scale that would result in potential reductions to lifetime reproductive success and survival rates to some individuals, but not enough to affect the conservation status or long-term viability of the population. This is therefore a **Medium** magnitude.
372. As per the project alone assessment, the sensitivity of bottlenose dolphins to pile driving of WTG is **Low**.
373. Therefore, the overall significance of the cumulative effect is **Minor (not significant)**.

11 km EDR for mitigated piling

374. Using the 11 km mitigated piling EDR, the iPCoD results show that the level of disturbance predicted is not sufficient to result in any changes to the bottlenose dolphin population, since the impacted population is predicted to continue at a stable trajectory at >99.8% of the size of the unimpacted population (**Plate 9-2** and **Table 9-15**). The effect of disturbance from a single piling event is expected to last less than a day, though the disturbance impact across the five projects will occur intermittently across 5 years. This is expected to result in short-term and / or intermittent and temporary behavioural effects in a small proportion of the population. It is expected that the temporary changes in behaviour and/or distribution of individuals are at a scale that would result in potential reductions to lifetime reproductive success and survival rates to some individuals, but not enough to affect the population trajectory over the long term. This is therefore a **Medium** magnitude.
375. As per the project alone assessment, the sensitivity of porpoise to pile driving of WTG is **Low**.
376. Therefore, the overall significance of the cumulative effect is **Minor (not significant)**.

Table 9-12 Number of bottlenose dolphins disturbed per piling day at the Phase 1 OWFs.

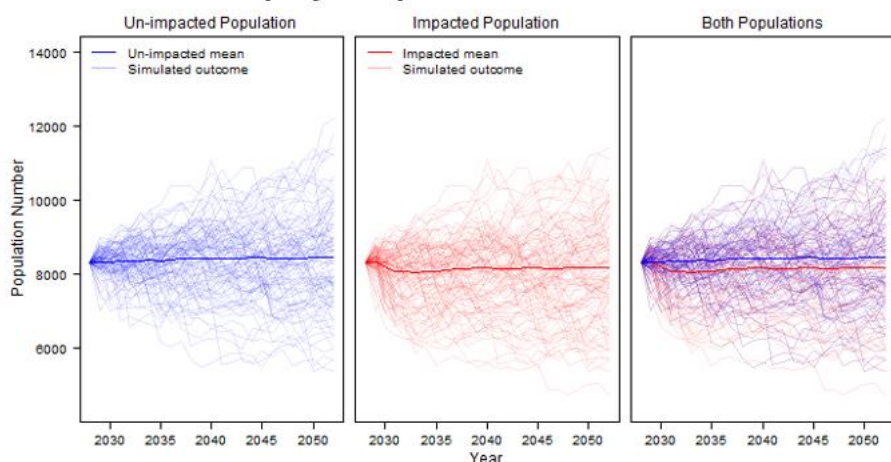
Key: **Planning**, **Construction**, **Operation**

OWF	Density used	Disturbance	Piling Days	2028	2029	2030	2031	2032
Values from the project specific EIAs								
CWP	0.2352 (SCANS IV block)	Dose-response	78				448	
Arklow	0.2352 (SCANS IV block)	Dose-response	79		2092			
NISA	0.2352 (SCANS IV block)	Dose-response	51		2326			
Oriel	0.2352 (SCANS IV block)	Dose-response	26	129				
Dublin	0.2352 (SCANS IV block)	Dose-response	125			699	699	699

Values using an 11 km EDR for mitigated piling and SCANS IV Block CS-D density

CWP	0.2352	11 km EDR	78				89	
Arklow	0.2352	11 km EDR	79		89			
NISA	0.2352	11 km EDR	51		89			
Oriel	0.2352	11 km EDR	26	89				
Dublin	0.2352	11 km EDR	125			89	89	89

Values from the project specific EIAs



Values using an 11 km EDR and SCANS IV Block CS-D density

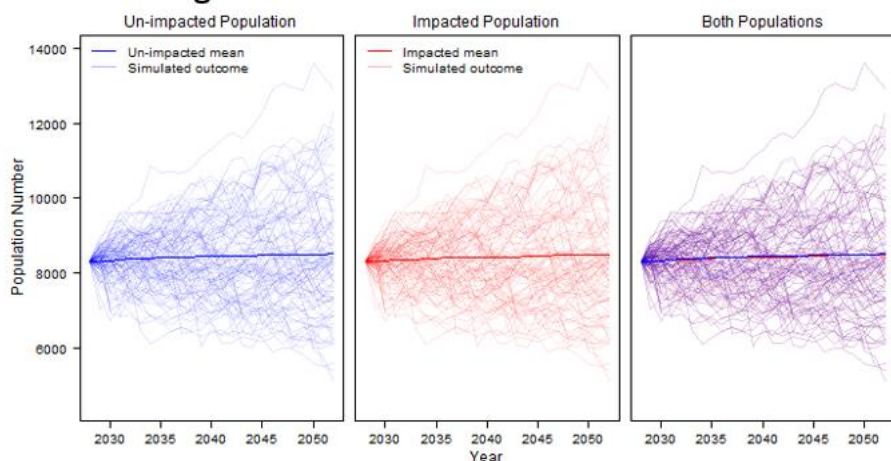


Plate 9-2 Bottlenose dolphin predicted population trajectories

Modelled unimpacted population (left), the modelled impacted population (middle) and together (right) for disturbance from the Phase 1 OWFs using values of disturbance from project specific EIAs (top) and using an 11 km EDR for mitigated piling and the SCANS IV density (bottom)

Table 9-13 Predicted mean population size for the un-impacted (baseline) and impacted bottlenose dolphin population for disturbance from the Phase 1 OWFs

Year	Unimpacted population size (mean)	Impacted population size (mean)	Impacted population size (mean) as % of unimpacted population size (mean)
Values from the project specific EIAs			
Start 2028 (before CEA piling)	8,322	8,322	100.00%
End 2032 (end of CEA piling)	8,380	8,046	96.01%
End 2038 (6 yr after CEA piling ends)	8,439	8,177	96.90%
End 2044 (12 yr after CEA piling ends)	8,456	8,176	96.69%
End 2050 (18 yr after CEA piling ends)	8,462	8,184	96.71%
Values using an 11 km EDR for mitigated piling and SCANS IV Block CS-D density			
Start 2028 (before CEA piling)	8,322	8,322	100.00%
End 2032 (end of CEA piling)	8,390	8,374	99.81%
End 2038 (6 yr after CEA piling ends)	8,446	8,434	99.86%
End 2044 (12 yr after CEA piling ends)	8,479	8,466	99.85%
End 2050 (18 yr after CEA piling ends)	8,512	8,500	99.86%

Bottlenose dolphin - Cumulative OWF in Irish Sea MU

377. The bottlenose dolphin cumulative assessment for disturbance from WTG pile driving across the Irish Sea MU screened in 11 OWF in addition to CWP. Given that it is expected OWFs constructing in English, Welsh and Irish waters will likely implement noise reduction measures, the assessment was standardised assuming an 11 km EDR for mitigated pile driving for each OWF and using the relevant SCANS IV block density.
378. For Tier 1, there were nine OWFs screened in, in addition to CWP, resulting in OWF pile driving between 2025 and 2032 (**Table 9-13**). The maximum predicted impact is expected to occur in 2029 when four Tier 1 OWFs are expected to be piling, where the predicted impact is to 187 dolphins per piling day (2.3% MU). In 2031 when CWP is piling, there is expected to be piling at only two other Tier 1 projects, where the predicted impact is to 182 dolphins per piling day (2.2% MU, CWP contributes 49% of this total).
379. For Tier 1-3, there were 11 OWFs screened in, in addition to CWP, resulting in OWF pile driving between 2025 and 2032 (**Table 9-11**). The maximum predicted impact is expected to occur in 2029 when six Tier 1-3 OWFs are expected to be piling, where the predicted impact is to 366 dolphins per piling day (4.4% MU). In 2031 when CWP is piling, there is expected to be piling at only four other Tier 1-3 projects, where the predicted impact is to 361 dolphins per piling day (4.4% MU, CWP contributes 25% of this total).
380. The effect of disturbance from a single piling event is expected to last less than a day, though the disturbance impact across the cumulative Tier 1-3 projects will occur intermittently across eight years. This is expected to result in short-term and / or intermittent and temporary behavioural effects in a small proportion of the population. It is expected that the temporary changes in behaviour and/or distribution of individuals are at a scale that would result in potential reductions to lifetime reproductive success and survival rates to some individuals, but not enough to affect the population trajectory over the long term. This is therefore a **Medium** magnitude.

381. As per the project alone assessment, the sensitivity of bottlenose dolphins to pile driving of WTG is **Low**.

382. Therefore, the overall significance of the cumulative effect is **Minor (not significant)**.

Table 9-14 Bottlenose dolphin cumulative assessment for disturbance from OWF pile driving in the Irish Sea MU.

Key: Planning, Construction, Operation

OWF	Tier	EDR (km)	SCANS IV block	Density (#/km ²)	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
CWP		11	CS-D	0.2352							89					
Arklow Bank Wind Park 2	1	11	CS-D	0.2352					89							
Dublin Array	1	11	CS-D	0.2352						89	89	89				
North Irish Sea Array	1	11	CS-D	0.2352					89							
Oriel	1	11	CS-D	0.2352				89								
Mona	1	11	CS-E	0.0104	4	4	4	4								
Awel y Môr	1	11	CS-E	0.0104	4	4	4									
Morgan	1	11	CS-E	0.0104	4	4	4	4								
Isle of Man (Moor Vannin)	1	11	CS-E	0.0104				4	4	4	4					
Morecambe	1	11	CS-E	0.0104			4	4	4	4						
North Channel Wind 2	3	11	CS-D	0.2352				89	89	89	89					
North Channel Wind 1	3	11	CS-D	0.2352				89	89	89	89					
CWP + Tier 1				Total	12	12	16	105	187	97	182	89	0	0	0	0
				%MU	0.1	0.1	0.2	1.3	2.3	1.2	2.2	1.1	0.0	0.0	0.0	0.0
CWP + Tier 1 + 2 + 3				Total	12	12	16	284	366	276	361	89	0	0	0	0
				%MU	0.1	0.1	0.2	3.5	4.4	3.4	4.4	1.1	0.0	0.0	0.0	0.0

Common dolphin - Phase 1 Projects

383. The iPCoD model is not currently parameterised to model disturbance to common dolphins from pile driving, therefore population modelling for the Phase 1 projects is not possible.

EIA Values

384. When using the project specific EIAR values, it is important to note the varying densities used, meaning the assessments are not necessarily comparable/compatible. The largest predicted impact is in 2029 when both Arklow and NISA expected to be pile driving. If both projects pile on the same day, then it is expected that up to 839 common dolphins may experience disturbance per piling day, which equates to 0.8% MU. In 2031 when both CWP and Dublin are expected to be piling, if both projects pile on the same day then it is expected that up to 616 common dolphins may experience disturbance per piling day, which equates to 0.6% MU.

385. The effect of disturbance from a single piling event is expected to last less than a day, though the disturbance impact across the Phase 1 projects will occur intermittently across 5 years. This is expected to result in short-term and / or intermittent and temporary behavioural effects in a small proportion of the population. It is expected that the temporary changes in behaviour and/or distribution of individuals are at a scale that would result in potential reductions to lifetime reproductive success and survival rates to some individuals, but not enough to affect the population trajectory over the long term. This is therefore a **Medium** magnitude.
386. As per the project alone assessment, the sensitivity of common dolphins to pile driving of WTG is **Low**.
387. Therefore, the overall significance of the cumulative effect is **Minor (not significant)**.

11 km EDR for mitigated piling

388. When using the 11 km mitigated piling EDR and the SCANS IV block density, number of animals predicted to be impacted per piling day is lower. The predicted impact is highest in 2029 when Arklow and NISA are both piling and in 2031 when both CWP and Dublin are piling. However, the predicted impact is to a maximum of 20 dolphins per day if projects pile on the same day, which equates to <0.02% MU.
389. The effect of disturbance from a single piling event is expected to last less than a day, though the disturbance impact across the cumulative Phase 1 projects will occur intermittently across 5 years. This is expected to result in short-term and / or intermittent and temporary behavioural effects in a very small proportion of the population. It is expected that the temporary changes in behaviour and/or distribution of individuals are at a scale that would result in potential reductions to lifetime reproductive success and survival rates to some individuals, but not enough to affect the population trajectory over the long term. This is therefore a **Medium** magnitude.
390. As per the project alone assessment, the sensitivity of common dolphins to pile driving of WTG is **Low**.
391. Therefore, the overall significance of the cumulative effect is **Minor (not significant)**.

Table 9-15 Number of common dolphins disturbed per piling day at the Phase 1 OWFs.

Key: **Planning**, **Construction**, **Operation**

OWF	Density used	Disturbance	Piling Days	2028	2029	2030	2031	2032
Values from the project specific EIAs								
CWP	grid cell specific (Irish Sea surface)	Dose-response	78				535	
Arklow	grid cell specific (SCANS III surface)	Dose-response	79		429			
NISA	0.0272 (SCANS IV block)	Dose-response	51		410			
Oriel	0.0272 (SCANS IV block)	Dose-response	26	15				
Dublin	0.0272 (SCANS IV block)	Dose-response	125			81	81	81
Total				15	839	81	616	81
% MU				0.0%	0.8%	0.1%	0.6%	0.1%

Values using an 11 km EDR for mitigated piling and SCANS IV Block CS-D density

CWP	0.0272	11 km EDR	78				10	
Arklow	0.0272	11 km EDR	79		10			
NISA	0.0272	11 km EDR	51		10			
Oriel	0.0272	11 km EDR	26	10				
Dublin	0.0272	11 km EDR	125			10	10	10
Total				10	20	10	20	10
% MU				0.0%	0.0%	0.0%	0.0%	0.0%

Common dolphin – Cumulative OWF in Celtic and Greater North Sea MU

392. The common dolphin cumulative assessment for disturbance from WTG pile driving across the Celtic and Greater North Seas MU screened in 120 OWF in addition to CWP. Given that it is expected OWFs constructing in English, Welsh and Irish waters will likely implement noise reduction measures, the assessment was standardised assuming an 11 km EDR for mitigated pile driving for each OWF and using the relevant SCANS IV block density. However, to date, noise abatement methods have not been required in Scottish waters, and thus Scottish projects have been conservatively assessed using a 20 km EDR for unmitigated piling (JNCC, 2025).
393. For Tier 1, there were 64 OWFs screened in, in addition to CWP, resulting in OWF pile driving between 2025 and 2032 (**Table 9-18**). Note, of these 64 projects, 41 were in low density common dolphin SCANS IV blocks and thus were predicted to impact 0 dolphins per piling day (these were excluded from Table 0.19). For the remaining 23 Tier 1 projects in addition to CWP, the maximum level of impact was expected to occur in 2025 when 16 OWF are expected to be pile driving. Assuming they all pile on the same day (which is highly unlikely) then up to 987 common dolphins would be disturbed per piling day (1.0% MU). In 2031 when CWP is expected to be piling, there is expected to be piling from only two other Tier 1 projects, resulting in up to 25 dolphins disturbed per piling day (0.02% MU) assuming projects pile on the same day.
394. For Tier 1-3, there were 120 OWFs screened in, in addition to CWP, resulting in OWF pile driving between 2025 and 2036 (Table 9-16). Note, of these 120 projects, 86 were in low density common dolphin SCANS IV blocks and thus were predicted to impact 0 dolphins per piling day (these were excluded from Table 0.19). For the remaining 34 Tier 1-3 projects in addition to CWP, the maximum level of impact was expected to occur in 2029 when 14 OWF are expected to be pile driving. Assuming they all pile on the same day (which is highly unlikely given WindEurope estimates indicate a maximum of 10-15 foundation installation vessels being available, of which only 6 may be capable of installing larger monopiles) then up to 1,398 common dolphins would be disturbed per piling day (1.4% MU). In 2031 when CWP is expected to be piling, there is expected to be piling at 10 other Tier 1-3 projects, resulting in up to 757 dolphins disturbed per piling day (0.7% MU) assuming projects pile on the same day.
395. The effect of disturbance from a single piling event is expected to last less than a day, though the disturbance impact across the cumulative Tier 1-3 projects will occur intermittently across 12 years. This is expected to result in short-term and / or intermittent and temporary behavioural effects in a small proportion of the population. It is expected that the temporary changes in behaviour and/or distribution of individuals are at a scale that would result in potential reductions to lifetime reproductive

success and survival rates to some individuals, but not enough to affect the population trajectory over the long term. This is therefore a **Medium** magnitude.

396. As per the project alone assessment, the sensitivity of common dolphins to pile driving of WTG is **Low**.

397. Therefore, the overall significance of the cumulative effect is **Minor (not significant)**.

Table 9-16 Common dolphin cumulative assessment for disturbance from OWF pile driving in the Celtic and Greater North Sea MU. Projects located in SCANS IV blocks where the density results in impact to 0 dolphins have been removed.

Key: **Planning**, **Construction**, **Operation**

OWF	Tier	EDR (km)	SCANS IV block	Density (#/km ²)	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
CWP	1	11	CS-D	0.0272							10					
Arklow Bank Wind Park 2	1	11	CS-D	0.0272					10							
Dublin Array	1	11	CS-D	0.0272						10	10	10				
North Irish Sea Array	1	11	CS-D	0.0272					10							
Oriel	1	11	CS-D	0.0272				10								
Erebus Floating Wind Demo	1	11	CS-C	0.841	320	320										
Llŷr 1	1	11	CS-C	0.841			320	320	320							
White Cross	1	11	CS-C	0.841	320	320	320									
Rampion 2	1	11	NS-A	0.0139	5	5	5	5								
Outer Dowsing	1	11	NS-C	0.0032			1	1	1	1						
Dudgeon Extension	1	11	NS-C	0.0032	1	1										
Centre-Manche 1	1	11	NS-A	0.0139			5	5	5	5	5					
Saint-Brieuc	1	11	CS-A	0.3657	139											
Courseulles-sur-mer	1	11	NS-A	0.0139	5	5										
Hornsea Project Three	1	11	NS-C	0.0032	1	1	1	1								
Fécamp	1	11	NS-A	0.0139	5	5										
East Anglia Two	1	11	NS-C	0.0032	1	1	1	1								
Norfolk Vanguard West	1	11	NS-C	0.0032	1	1	1	1								
East Anglia One North	1	11	NS-C	0.0032	1	1	1	1								
Dieppe Le Tréport	1	11	NS-A	0.0139	5	5	5									
Norfolk Boreas	1	11	NS-C	0.0032	1											
Norfolk Vanguard East	1	11	NS-C	0.0032	1	1	1									
East Anglia Three	1	11	NS-C	0.0032	1	1	1									
Iles d'Yeu et de Noirmoutier	1	11	BB-B	0.4729	180	180										
Celtic Seas Round 5 PDA1 (Gwynt Glas)	3	11	CS-C	0.841								320	320	320	320	320
North Channel Wind 2	3	11	CS-D	0.0272				10	10	10	10					
Llŷr 2	3	11	CS-C	0.841			320	320	320							
North Channel Wind 1	3	11	CS-D	0.0272				10	10	10	10					

OWF	Tier	EDR (km)	SCANS IV block	Density (#/km ²)	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Machair	3	20	CS-F	0.0544					68	68	68	68				
Parc éolien posé au large de la Normandie (AO4)	3	11	NS-A	0.0139		5	5									
Centre-Manche 2	3	11	NS-A	0.0139				5	5	5	5	5				
Spiorad na Mara	3	20	CS-I	0.1678					211	211	211	211				
Sud de la Bretagne	3	11	BB-B	0.4729					180	180	180	180				
Ayre	3	20	CS-F	0.0544				68	68	68	68					
Sud Atlantique	3	11	BB-B	0.4729					180	180	180					
CWP + Tier 1				Total	987	847	662	345	346	16	25	10	0	0	0	0
				%MU	1.0	0.8	0.6	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CWP + Tier 1 + 2 + 3				Total	987	852	987	758	1398	748	757	794	320	320	320	320
				%MU	1.0	0.8	1.0	0.7	1.4	0.7	0.7	0.8	0.3	0.3	0.3	0.3

Risso's dolphin - Phase 1 Projects

398. The IPCoD model is not currently parameterised to model disturbance to Risso's dolphins from pile driving, therefore population modelling for the Phase 1 projects is not possible.

EIA Values

399. When using the project specific EIAR values, it is important to note the varying densities used, meaning the assessments are not necessarily comparable/compatible, in addition to the fact that NISA, Oriel and Dublin Array did not assess impacts to Risso's dolphins, the latter not identifying any Risso's within site specific surveys. The largest predicted impact is in 2029 when Arklow is expected to be pile driving, disturbing up to 276 dolphins per piling day (2.3% MU). In 2031 when CWP is expected to be piling, up to 21 dolphins (0.2% MU) are predicted to be disturbed per piling day.
400. The effect of disturbance from a single piling event is expected to last less than a day, though the disturbance impact across the Phase 1 projects will occur intermittently across 2 years (given there is no assessed impact from NISA, Oriel or Dublin). This is expected to result in short-term and / or intermittent and temporary behavioural effects in a small proportion of the population. It is expected that the temporary changes in behaviour and/or distribution of individuals are at a scale that would result in potential reductions to lifetime reproductive success and survival rates to some individuals, but not enough to affect the population trajectory over the long term. This is therefore a **Medium** magnitude.
401. As per the project alone assessment, the sensitivity of Risso's dolphins to pile driving of WTG is **Low**.
402. Therefore, the overall significance of the cumulative effect is **Minor (not significant)**.

11 km EDR for mitigated piling

403. When using the 11 km mitigated piling EDR and the SCANS IV block density, number of animals predicted to be impacted per piling day is reduced to <1 dolphin at each Phase 1 project. This is therefore a **Negligible** magnitude.
404. As per the project alone assessment, the sensitivity of Risso's dolphins to pile driving of WTG is **Low**.
405. Therefore, the overall significance of the cumulative effect is **Negligible (not significant)**.

Table 9-17 Number of Risso's dolphins disturbed per piling day at the Phase 1 OWFs.

Key: **Planning**, **Construction**, **Operation**

OWF	Density used	Disturbance	Piling Days	2028	2029	2030	2031	2032
Values from the project specific EIAs								
CWP	grid cell specific (Irish Sea surface)	Dose-response	78				21	
Arklow	0.031 (SCANS III block)	Dose-response	79		276			
NISA	Not assessed		51		0			
Oriel	Not assessed		26	0				
Dublin	Not assessed		125			0	0	0
Total				0	276	0	21	0
% MU				0.0	2.3%	0.0	0.2%	0.0

Values using an 11 km EDR for mitigated piling and SCANS IV Block CS-D density

CWP	0.0022	11 km EDR	78				<1	
Arklow	0.0022	11 km EDR	79		<1			
NISA	0.0022	11 km EDR	51		<1			
Oriel	0.0022	11 km EDR	26	<1				
Dublin	0.0022	11 km EDR	125			<1	<1	<1

Risso's dolphin – Cumulative OWF in Celtic and Greater North Sea MU

406. The Risso's dolphin cumulative assessment for disturbance from WTG pile driving across the Celtic and Greater North Seas MU screened in 120 OWF in addition to CWP. Given that it is expected OWFs constructing in English, Welsh and Irish waters will likely implement noise reduction measures, the assessment was standardised assuming an 11 km EDR for mitigated pile driving for each OWF and using the relevant SCANS IV block density. However, to date, noise abatement methods have not been required in Scottish waters, and thus Scottish projects have been conservatively assessed using a 20 km EDR for unmitigated piling (JNCC, 2025).
407. For Tier 1, there were 64 OWFs screened in, in addition to CWP, resulting in OWF pile driving between 2025 and 2032 (**Table 9-20**). Note: of these 64 projects, 54 were in low density Risso's dolphin SCANS IV blocks and thus were predicted to impact 0 dolphins per piling day (these were excluded from Table 0.21). For the remaining 10 Tier 1 projects in addition to CWP, the maximum level of impact was expected to occur in 2025 when four OWF are expected to be pile driving. Assuming they all pile on the same day, then up to 101 Risso's dolphins would be disturbed per piling day (0.8% MU). In 2031 when CWP is expected to be piling, there is expected to be piling from only two other Tier 1 projects,

resulting in up to 49 dolphins disturbed per piling day (0.4% MU) assuming projects pile on the same day.

408. For Tier 1-3, there were 120 OWFs screened in, in addition to CWP, resulting in OWF pile driving between 2025 and 2036 (**Table 9-20**) Note: of these 120 projects, 93 were in low density Risso's dolphin SCANS IV blocks and thus were predicted to impact 0 dolphins per piling day (these were excluded from Table 0.21). For the remaining 27 Tier 1-3 projects in addition to CWP, the maximum level of impact was expected to occur in 2029 when 20 OWF are expected to be pile driving. Assuming they all pile on the same day (which is highly unlikely, given WindEurope estimates indicate a maximum of 10-15 foundation installation vessels being available, of which only 6 may be capable of installing larger monopiles) then up to 720 Risso's dolphins would be disturbed per piling day (5.9% MU). In 2031 when CWP is expected to be piling, there is expected to be piling at 17 other Tier 1-3 projects, resulting in up to 716 dolphins disturbed per piling day (5.8% MU) assuming projects pile on the same day.
409. The effect of disturbance from a single piling event is expected to last less than a day, though the disturbance impact across the cumulative Tier 1-3 projects will occur intermittently across 12 years. This is expected to result in short-term and / or intermittent and temporary behavioural effects in a small proportion of the population. It is expected that the temporary changes in behaviour and/or distribution of individuals are at a scale that would result in potential reductions to lifetime reproductive success and survival rates to some individuals, but not enough to affect the population trajectory over the long term. This is therefore a **Medium** magnitude.
410. As per the project alone assessment, the sensitivity of Risso's dolphins to pile driving of WTG is **Low**.
411. Therefore, the overall significance of the cumulative effect is **Minor (not significant)**.

Table 9-18 Risso's dolphin cumulative assessment for disturbance from OWF pile driving in the Celtic and Greater North Sea MU. Projects located in SCANS IV blocks where the density results in impact to 0 dolphins have been removed.

Key: **Planning**, **Construction**, **Operation**

OWF	Tier	EDR (km)	SCANS IV block	Density (#/km ²)	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
CWP		11	CS-D	0.002							1					
Arklow Bank Wind Park 2	1	11	CS-D	0.002					1							
Dublin Array	1	11	CS-D	0.002						1	1	1				
North Irish Sea Array	1	11	CS-D	0.002					1							
Oriel	1	11	CS-D	0.002				1								
Erebus Floating Wind Demo	1	11	CS-C	0.005	2	2										
Llŷr 1	1	11	CS-C	0.005			2	2	2							
White Cross	1	11	CS-C	0.005	2	2	2									
Moray West	1	20	CS-K	0.037	47	47										
Caledonia	1	20	CS-K	0.037				47	47	47	47					

OWF	Tier	EDR (km)	SCANS IV block	Density (#/km ²)	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Pentland Floating	1	20	CS-K	0.037	47	47	47									
Celtic Seas Round 5 PDA1 (Gwynt Glas)	3	11	CS-C	0.005								2	2	2	2	2
North Channel Wind 2	3	11	CS-D	0.002				1	1	1	1					
Llŷr 2	3	11	CS-C	0.005			2	2	2							
North Channel Wind 1	3	11	CS-D	0.002				1	1	1	1					
Machair	3	20	CS-F	0.002					3	3	3	3				
Broadshor e	3	20	CS-K	0.037				47	47	47	47	47				
Scaraben	3	20	CS-K	0.037					47	47	47	47				
Sinclair	3	20	CS-K	0.037					47	47	47	47				
Talisk	3	20	CS-J	0.028					36	36	36	36				
Marram	3	20	NS-E	0.070					88	88	88					
Stromar	3	20	CS-K	0.037					47	47	47					
Havbrede y	3	20	CS-J	0.028					36	36	36					
West of Orkney	3	20	CS-J/K	0.037					47	47	47					
Buchan	3	20	NS-E	0.070					88	88	88					
Ayre	3	20	CS-F	0.002				3	3	3	3					
Arven	3	20	NS-E	0.070					88	88	88					
Stoura	3	20	NS-E	0.070					88	88	88					
CWP + Tier 1				Total	101	98	51	50	51	48	49	1	0	0	0	0
				%MU	0.8	0.8	0.4	0.4	0.4	0.4	0.4	0.0	0.0	0.0	0.0	0.0
CWP + Tier 1 + 2 + 3				Total	101	98	53	104	720	715	716	183	2	2	2	2
				%MU	0.8	0.8	0.4	0.8	5.9	5.8	5.8	1.5	0.0	0.0	0.0	0.0

Minke whale - Phase 1 Projects

412. The assessment of the Phase 1 OWF is presented using both the EIAR values and assumed mitigated piling using an 11 km EDR (**Table 9-19**).
413. The iPCoD results show that the level of disturbance predicted under either method is not sufficient to result in any changes to the minke whale population, since the impacted population is predicted to continue at a stable trajectory at 100% of the size of the unimpacted population (Figure 0-3 and Table 0.23). The effect of disturbance from a single piling event is expected to last less than a day, though the disturbance impact across the five projects will occur intermittently across 5 years. This is expected to result in short-term and / or intermittent and temporary behavioural effects in a small proportion of

the population. It is expected that the temporary changes in behaviour and/or distribution of individuals are at a scale that would result in potential reductions to lifetime reproductive success and survival rates to some individuals, but not enough to affect the population trajectory over the long term. This is therefore a **Medium** magnitude.

414. As per the project alone assessment, the sensitivity of minke whales to pile driving of WTG is **Low**.

415. Therefore, the overall significance of the cumulative effect is **Minor (not significant)**.

Table 9-19 Number of minke whales disturbed per piling day at the Phase 1 OWF.

Key: **Planning**, **Construction**, **Operation**

OWF	Density used	Disturbance	Piling Days	2028	2029	2030	2031	2032

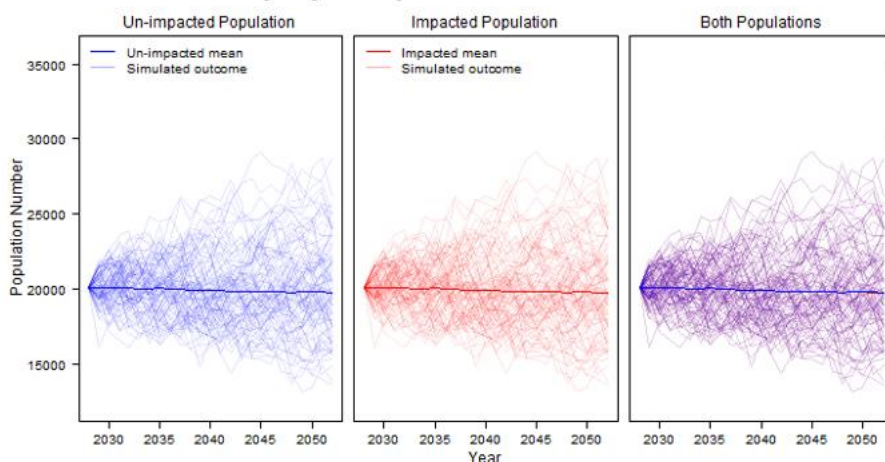
Values from the project specific EIAs

CWP	grid cell specific (Irish Sea surface)	Dose-response	78				31	
Arklow	0.045 (Observe 1)	Dose-response	79		400			
NISA	grid cell specific (SCANS III surface)	Dose-response	51		222			
Oriel	0.26 (Oriel DAS)	Dose-response	26	142				
Dublin	grid cell specific (SCANS III surface)	Dose-response	125			57	57	57

Values using an 11 km EDR for mitigated piling and SCANS IV Block CS-D density

CWP	0.0137	11 km EDR	78				5	
Arklow	0.0137	11 km EDR	79		5			
NISA	0.0137	11 km EDR	51		5			
Oriel	0.0137	11 km EDR	26	5				
Dublin	0.0137	11 km EDR	125			5	5	5

Values from the project specific EIAs



Values using an 11 km EDR and SCANS IV Block CS-D density

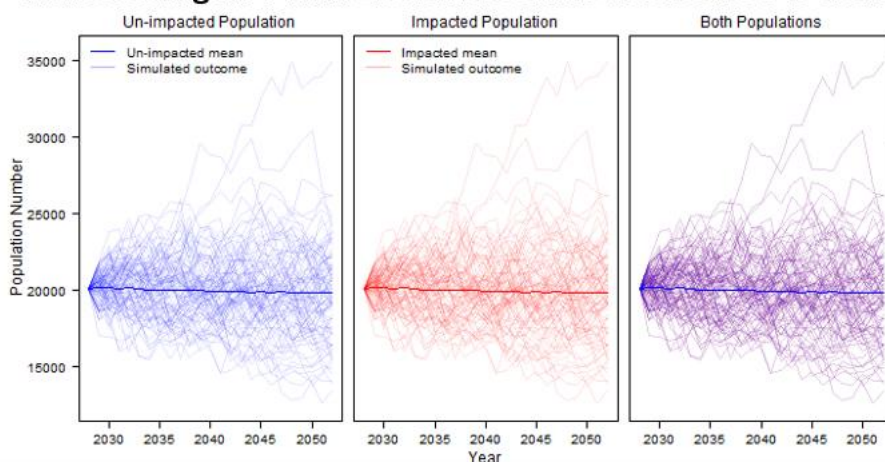


Plate 9-3 Minke whale predicted population trajectories

Modelled unimpacted population (left), the modelled impacted population (middle) and together (right) for disturbance from the Phase 1 OWFs using values of disturbance from project specific EIAs (top) and using an 11 km EDR for mitigated piling and the SCANS IV density (bottom)

Table 9-20 Predicted mean population size for the un-impacted (baseline) and impacted minke whale population for disturbance from the Phase 1 OWFs

Year	Unimpacted population size (mean)	Impacted population size (mean)	Impacted population size (mean) as % of unimpacted population size (mean)
Values from the project specific EIAs			
Start 2028 (before CEA piling)	20,120	20,120	100.00%
End 2032 (end of CEA piling)	20,040	20,039	100.00%
End 2038 (6 yr after CEA piling ends)	19,879	19,879	100.00%
End 2044 (12 yr after CEA piling ends)	19,860	19,860	100.00%
End 2050 (18 yr after CEA piling ends)	19,788	19,788	100.00%

Year	Unimpacted population size (mean)	Impacted population size (mean)	Impacted population size (mean) as % of unimpacted population size (mean)
Values using an 11 km EDR for mitigated piling and SCANS IV Block CS-D density			
Start 2028 (before CEA piling)	20,120	20,120	100%
End 2032 (end of CEA piling)	20,048	20,048	100%
End 2038 (6 yr after CEA piling ends)	19,960	19,960	100%
End 2044 (12 yr after CEA piling ends)	19,889	19,889	100%
End 2050 (18 yr after CEA piling ends)	19,824	19,824	100%

Minke whale – Cumulative OWF in Celtic and Greater North Sea MU

416. The minke whale cumulative assessment for disturbance from WTG pile driving across the Celtic and Greater North Seas MU screened in 120 OWF in addition to CWP. Given that it is expected OWFs constructing in English, Welsh and Irish waters will likely implement noise reduction measures, the assessment was standardised assuming an 11 km EDR for mitigated pile driving for each OWF and using the relevant SCANS IV block density. However, to date, noise abatement methods have not been required in Scottish waters, and thus Scottish projects have been conservatively assessed using a 20 km EDR for unmitigated piling (JNCC, 2025).
417. For Tier 1, there were 64 OWFs screened in, in addition to CWP, resulting in OWF pile driving between 2025 and 2032 (**Table 9-21**). Note, of these 64 projects, 16 were in low density minke whale SCANS IV blocks and thus were predicted to impact 0 whales per piling day (these were excluded from **Table 9-21**). For the remaining 48 Tier 1 projects in addition to CWP, the maximum level of impact was expected to occur in 2027 when 31 OWF are expected to be pile driving. Assuming they all pile on the same day (which is very highly unlikely), then up to 417 whales would be disturbed per piling day (2.1% MU). In 2031 when CWP is expected to be piling, there is expected to be piling from nine other Tier 1 projects, resulting in up to 226 whales disturbed per piling day (1.1% MU) assuming projects pile on the same day.
418. For Tier 1-3, there were 120 OWFs screened in, in addition to CWP, resulting in OWF pile driving between 2025 and 2036 (**Table 9-21**). Note, of these 120 projects, 41 were in low density minke whale SCANS IV blocks and thus were predicted to impact 0 whales per piling day (these were excluded from **Table 9-21**). For the remaining 79 Tier 1-3 projects in addition to CWP, the maximum level of impact was expected to occur in 2029 when 43 OWF are expected to be pile driving. Assuming they all pile on the same day (which is very highly unlikely, given WindEurope estimates indicate a maximum of 10-15 foundation installation vessels being available, of which only 6 may be capable of installing larger monopiles) then up to 1,165 whales would be disturbed per piling day (5.8% MU). In 2031 when CWP is expected to be piling, there is expected to be piling at 36 other Tier 1-3 projects, resulting in up to 1,046 whales disturbed per piling day (5.2% MU) assuming projects pile on the same day.
419. The effect of disturbance from a single piling event is expected to last less than a day, though the disturbance impact across the cumulative Tier 1-3 projects will occur intermittently across 12 years. This is expected to result in short-term and / or intermittent and temporary behavioural effects in a small proportion of the population. It is expected that the temporary changes in behaviour and/or distribution of individuals are at a scale that would result in potential reductions to lifetime reproductive success and survival rates to some individuals, but not enough to affect the population trajectory over the long term. This is therefore a **Medium** magnitude.
420. As per the project alone assessment, the sensitivity of minke whales to pile driving of WTG is **Low**.

421. Therefore, the overall significance of the cumulative effect is **Minor (not significant)**.

Table 9-21 Minke whale cumulative assessment for disturbance from OWF pile driving in the Celtic and Greater North Sea MU. Projects located in SCANS IV blocks where the density results in impact to <1 whale have been removed.

Key: **Planning**, **Construction**, **Operation**

OWF	Tier	EDR (km)	SCANS IV block	Density (#/km ²)	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
CWP		11	CS-D	0.013							5					
Arklow Bank Wind Park 2	1	11	CS-D	0.013					5							
Dublin Array	1	11	CS-D	0.013						5	5	5				
North Irish Sea Array	1	11	CS-D	0.013					5							
Oriel	1	11	CS-D	0.013			5									
Mona	1	11	CS-E	0.008	3	3	3	3								
Awel y Môr	1	11	CS-E	0.008	3	3	3									
Morgan	1	11	CS-E	0.008	3	3	3	3								
Isle of Man (Moor Vannin)	1	11	CS-E	0.008				3	3	3	3					
Morecambe	1	11	CS-E	0.008			3	3	3	3						
Erebus Floating Wind Demo	1	11	CS-C	0.007	3	3										
Llŷr 1	1	11	CS-C	0.007			3	3	3							
White Cross	1	11	CS-C	0.007	3	3	3									
Forthwind	1	20	NS-D	0.041	53	53	53									
Berwick Bank	1	20	NS-D	0.041	53	53	53	53	53							
Inch Cape	1	20	NS-D	0.041	53	53										
Outer Dowsing	1	11	NS-C	0.006			3	3	3	3						
Dudgeon Extension	1	11	NS-C	0.006	3	3										
Dogger Bank South (West)	1	11	NS-D	0.041			16	16	16	16	16					
Saint-Brieuc	1	11	CS-A	0.003	1											
Ossian	1	20	NS-D	0.041			53	53	53	53						
Dogger Bank - Creyke Beck A	1	11	NS-D	0.041	16											
Dogger Bank South (East)	1	11	NS-D	0.041			16	16	16	16	16					
Hornsea Project Three	1	11	NS-C	0.006	3	3	3	3								
East Anglia Two	1	11	NS-C	0.006	3	3	3	3								
Norfolk Vanguard West	1	11	NS-C	0.006	3	3	3	3								

OWF	Tier	EDR (km)	SCANS IV block	Density (#/km ²)	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
East Anglia One North	1	11	NS-C	0.006	3	3	3	3								
Dogger Bank - Teesside B (Sofia)	1	11	NS-D	0.041	16	16	16									
Moray West	1	20	CS-K	0.011	15	15										
Norfolk Boreas	1	11	NS-C	0.006	3											
Norfolk Vanguard East	1	11	NS-C	0.006	3	3	3									
East Anglia Three	1	11	NS-C	0.006	3	3	3									
Muir Mhòr	1	20	NS-D	0.041				53	53	53	53					
Salamander	1	20	NS-D	0.041	53	53	53									
Caledonia	1	20	CS-K	0.011				15	15	15	15					
Dogger Bank C - Teesside A	1	11	NS-D	0.041	16	16										
Aspen	1	20	NS-D	0.041				53	53	53	53	53				
IJmuiden Ver	1	11	NS-H	0.015			6	6	6	6	6					
Borssele Kavel V	1	11	NS-H	0.015	6	6	6	6								
Green Volt	1	20	NS-D	0.041			53	53	53	53	53					
Hollandse Kust F	1	11	NS-H	0.015	6	6										
Pentland Floating	1	20	CS-K	0.011	15	15	15									
HKW Kavel VII	1	11	NS-H	0.015		6	6									
Hollandse Kust (West)	1	11	NS-H	0.015	6	6	6									
HKW Kavel VI	1	11	NS-H	0.015		6	6									
HKZ Kavel II	1	11	NS-H	0.015		6	6									
HKZ Kavel I	1	11	NS-H	0.015		6	6									
HKZ Kavel III	1	11	NS-H	0.015		6	6									
Poseidon	1	11	NS-L	0.007	3											
Morven	2	20	NS-D	0.041				53	53	53	53	53				
Bowdun	2	20	NS-D	0.041				53	53	53	53					
Celtic Seas Round 5 PDA1 (Gwynt Glas)	3	11	CS-C	0.007								3	3	3	3	3
North Channel Wind 2	3	11	CS-D	0.013				5	5	5	5					
Llŷr 2	3	11	CS-C	0.007			3	3	3							
North Channel Wind 1	3	11	CS-D	0.013				5	5	5	5					
Machair	3	20	CS-F	0.013					17	17	17	17				
Bellrock	3	20	NS-D	0.041				53	53	53	53	53				

OWF	Tier	EDR (km)	SCANS IV block	Density (#/km ²)	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Campion	3	20	NS-D	0.041					53	53	53	53				
Sporad na Mara	3	20	CS-I	0.029					37	37	37	37				
Cedar	3	20	NS-D	0.041					53	53	53	53				
Broadshore	3	20	CS-K	0.011				15	15	15	15	15				
IJmuiden Ver 2021 – Y-VER	3	11	NS-H	0.015	6	6										
Scaraben	3	20	CS-K	0.011					15	15	15	15				
Sinclair	3	20	CS-K	0.011					15	15	15	15				
Talisk	3	20	CS-J	0.022					28	28	28	28				
Cenos	3	20	NS-D	0.041			53	53	53	53	53					
Marram	3	20	NS-E	0.012					15	15	15					
Stromar	3	20	CS-K	0.011					15	15	15					
Havbredey	3	20	CS-J	0.022					28	28	28					
HKW Noord – HKW-N	3	11	NS-H	0.015	6	6										
West of Orkney	3	20	CS-J/K	0.022					28	28	28					
Buchan	3	20	NS-E	0.012					15	15	15					
Harbour Energy North	3	20	NS-D	0.041					53	53	53	53				
Harbour Energy South	3	20	NS-D	0.041					53	53	53	53				
Culzean	3	20	NS-D	0.041				53	53	53	53	53				
Ayre	3	20	CS-F	0.013				17	17	17	17					
Beech	3	20	NS-D	0.041					53	53	53	53				
Ten Noorden van de Wadden	3	11	NS-H	0.015					6	6	6					
Arven	3	20	NS-E	0.012					15	15	15					
Stoura	3	20	NS-E	0.012					15	15	15					
CWP + Tier 1				Tota	352	359	417	361	341	280	226	58	0	0	0	0
				%M	1.8	1.8	2.1	1.8	1.7	1.4	1.1	0.3	0.0	0.0	0.0	0.0
CWP + Tier 1 + 2 + 3				Tota	364	371	473	671	116	110	104	613	3	3	3	3
				%M	1.8	1.8	2.4	3.3	5.8	5.5	5.2	3.0	0.0	0.0	0.0	0.0

Harbour seal

422. Harbour seals were screened out of the cumulative impact assessment for disturbance from pile driving construction activities since <1 harbour seal was predicted to be disturbed per piling day at CWP alone. Therefore, there is no potential for CWP to contribute to a cumulative effect.

Grey seal - Phase 1 Projects

423. The assessment of the Phase 1 OWF is presented using EIAR values and assumed mitigated piling using an 11 km EDR (**Table 9-22**).
424. The IPCoD results using the EIAR values show that the level of disturbance predicted under either method is not sufficient to result in any changes to the grey seal population, since the impacted population is predicted to continue at a stable trajectory at 100% of the size of the unimpacted population (**Plate 9-4** and **Table 9-23**). The effect of disturbance from a single piling event is expected to last less than a day, though the disturbance impact across the five projects will occur intermittently across 5 years. This is expected to result in short-term and / or intermittent and temporary behavioural effects in a small proportion of the population. It is expected that the temporary changes in behaviour and/or distribution of individuals are at a scale that would result in potential reductions to lifetime reproductive success and survival rates to some individuals, but not enough to affect the population trajectory over the long term. This is therefore a **Medium** magnitude.
425. As per the project alone assessment, the sensitivity of grey seals to pile driving of WTG is **Low**.
426. Therefore, the overall significance of the cumulative effect is **Minor (not significant)**.

Table 9-22 Number of grey seals disturbed per piling day at the Phase 1 OWF.

Key: **Planning**, **Construction**, **Operation**

OWF	Density used	Disturbance	Piling Days	2028	2029	2030	2031	2032

Values from the project specific EIAs

CWP	Seal habitat preference map – grid cell specific	Dose-response	78				26	
Arklow	Seal habitat preference map – array and ECC average	Dose-response	79		300			
NISA	Seal habitat preference map	Dose-response	51		790			
Oriel	Seal habitat preference map – array area average	Dose-response	26	21				
Dublin	Seal habitat preference map	Dose-response	125			177	177	177

Values using an 11 km EDR for mitigated piling and average seal habitat preference map density across array area

CWP	0.0078	11 km EDR	78				3	
Arklow	0.0032	11 km EDR	79		1			
NISA	0.0138	11 km EDR	51		5			
Oriel	0.0201	11 km EDR	26	8				
Dublin	0.0127	11 km EDR	125			5	5	5

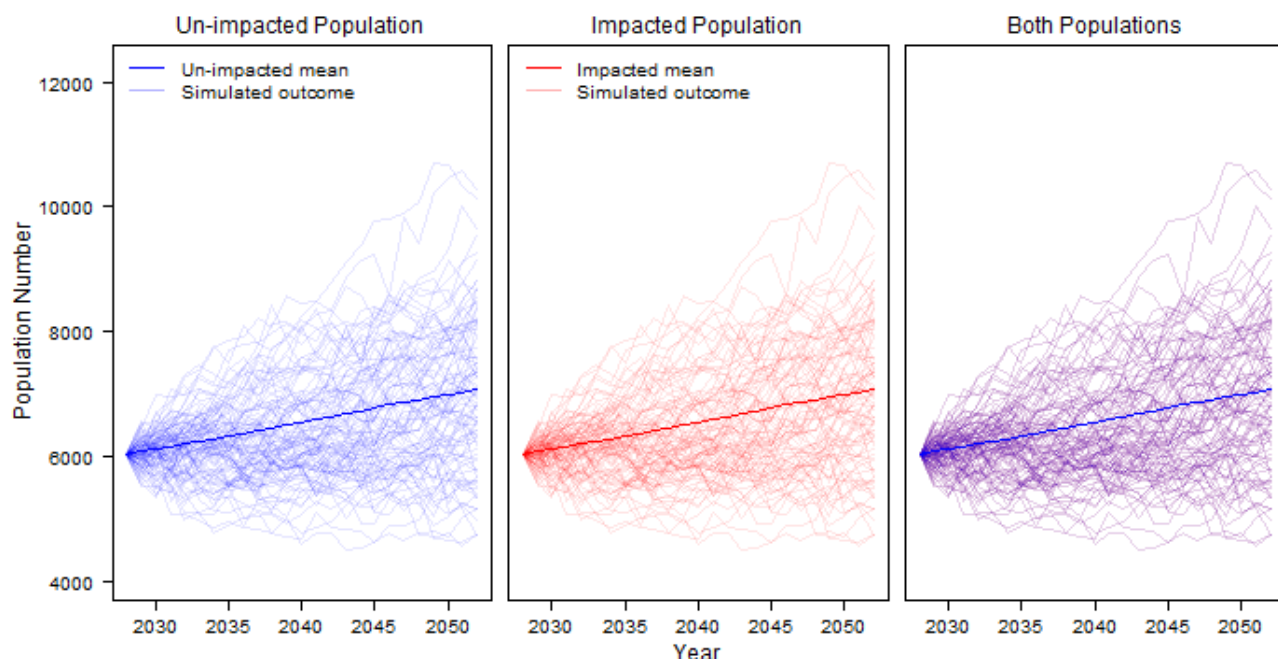


Plate 9-4 Grey seal predicted population trajectories for the modelled unimpacted population (left), the modelled impacted population (middle) and together (right) for disturbance from the Phase 1 OWFs

Table 9-23 Predicted mean population size for the un-impacted (baseline) and impacted grey seal population for disturbance from the Phase 1 OWFs

Year	Unimpacted population size (mean)	Impacted population size (mean)	Impacted population size (mean) as % of unimpacted population size (mean)
Start 2028 (before CEA piling)	6,054	6,054	100%
End 2032 (end of CEA piling)	6,259	6,259	100%
End 2038 (6 yr after CEA piling ends)	6,513	6,513	100%
End 2044 (12 yr after CEA piling ends)	6,785	6,785	100%
End 2050 (18 yr after CEA piling ends)	7,033	7,033	100%

Grey seal – Cumulative OWF in East Rol and Northern Ireland MU

427. The grey seal cumulative assessment for disturbance from WTG pile driving across the coastal east Irish waters (East Rol and Northern Ireland MU) screened in seven OWF in addition to CWP. Given that it is expected OWFs constructing in Irish waters will likely implement noise reduction measures, the assessment was standardised assuming an 11 km EDR for mitigated pile driving for each OWF and using average density across the array area and EDR using the grey seal habitat preference map.
428. For Tier 1, there were five OWFs screened in, in addition to CWP, resulting in OWF pile driving between 2028 and 2032 (**Table 9-24**). The maximum predicted impact is expected to occur in both 2028 and 2031. In 2028 there are expected to be two Tier 1 OWFs piling, where the predicted impact is to 11 grey seals per piling day (0.2% MU). In 2031 when CWP is piling, there is expected to be piling

at two other Tier 1 projects, where the predicted impact is to 11 grey seals per piling day (0.2% MU, CWP contributes 27% of this total).

429. For Tier 1-3, there were seven OWFs screened in, in addition to CWP, resulting in OWF pile driving between 2028 and 2032 (**Table 9-24**). The maximum predicted impact is expected to occur in both 2028 and 2031. In 2028 there are expected to be four Tier 1-3 OWFs piling, where the predicted impact is to 45 grey seals per piling day (0.7% MU). In 2031 when CWP is piling, there is expected to be piling at four other Tier 1-3 projects, where the predicted impact is to 45 grey seals per piling day (0.7% MU, CWP contributes 7% of this total).
430. The effect of disturbance from a single piling event is expected to last less than a day, though the disturbance impact across the cumulative Tier 1-3 projects will occur intermittently across five years. This is expected to result in short-term and / or intermittent and temporary behavioural effects in a small proportion of the population. It is expected that the temporary changes in behaviour and/or distribution of individuals are at a scale that would result in potential reductions to lifetime reproductive success and survival rates to some individuals, but not enough to affect the population trajectory over the long term. This is therefore a **Medium** magnitude.
431. As per the project alone assessment, the sensitivity of grey seals to pile driving of WTG is **Low**.
432. Therefore, the overall significance of the cumulative effect is **Minor (not significant)**.

Table 9-24 Grey seal cumulative assessment for disturbance from OWF pile driving in the East Rol and Northern Ireland MU.

Key: **Planning**, **Construction**, **Operation**

OWF	Tier	EDR (km)	Density (#/km ²)	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
CWP	1	11	0.0078							3					
Arklow Bank Wind Park 2	1	11	0.0032					1							
Dublin Array	1	11	0.0127						5	5	5				
North Irish Sea Array	1	11	0.0138					5							
Oriel	1	11	0.0201				8								
Isle of Man (Moor Vannin)	1	11	0.0073				3	3	3	3					
North Channel Wind 2	3	11	0.0300				11	11	11	11					
North Channel Wind 1	3	11	0.0594				23	23	23	23					
CWP + Tier 1				Total	0	0	0	11	9	8	11	5	0	0	0
				%MU	0.0	0.0	0.0	0.2	0.1	0.1	0.2	0.1	0.0	0.0	0.0
CWP + Tier 1 + 2 + 3				Total	0	0	0	45	43	42	45	5	0	0	0
				%MU	0.0	0.0	0.0	0.7	0.7	0.7	0.7	0.1	0.0	0.0	0.0

Cumulative Impact 4: Disturbance from other construction activities

433. While pile driving of WTGs has been quantitatively assessed separately in Cumulative Impact 3, there will be other non-pile driving construction activities at all OWF screened into the cumulative assessment (**Table 9-2**). In addition to the OWFs, there is expected to be non-piling construction activity associated with the construction of other offshore developments including subsea cables, offshore energy tidal and wave projects, coastal assets (**Table 9-3**). For each of these developments, there may be construction activities such as dredging, trenching, cable laying, rock placement and drilling. As detailed in the marine mammal assessment for CWP alone, the maximum disturbance range for these activities is expected to be a conservative estimate of 5 km.
434. Given the small disturbance ranges expected from disturbance from other construction activities, this CEA considers only construction activities in the Irish Sea that are expected to occur between 2031-2033 when CWP is conducting offshore construction activities.
435. There are seven other offshore developments that are expected to be constructing at the same time as CWP (2031-2033) in the Irish Sea. Using a 5 km EDR, as an assumed EDR for other construction activities, there is predicted to be an impact to:
- 194 harbour porpoise in 2031 (0.3% MU) (Table 0.6 (UXO) used as basis as EDR is the same)
 - 127 bottlenose dolphins in 2031 (1.5% MU) (Table 0.7 (UXO) used as basis as EDR is the same)
 - 14 common dolphins in 2031 (0.0% MU) (Table 0.8 (UXO) used as basis as EDR is the same)
 - 116 grey seals in 2031 (1.9% MU) (Table 0.9 (UXO) used as basis as EDR is the same)
 - (Note: Risso's dolphins, minke whales and harbour seals were screened out since <1 individual was predicted to be disturbed at CWP alone. Therefore, there is no potential for CWP to contribute to a cumulative effect).
436. The effect of disturbance from other construction activities will occur intermittently across three years. This is expected to result in short-term and / or intermittent and temporary behavioural effects in a small proportion of the population. It is expected that the temporary changes in behaviour and/or distribution of individuals are at a scale that would result in potential reductions to lifetime reproductive success and survival rates to some individuals, but not enough to affect the population trajectory over the long term. This is therefore a **Medium** magnitude.
437. As per the project alone assessment, the sensitivity of all marine mammals to disturbance from other construction activities is **Medium**.
438. Therefore, significance of the impact is assessed as **Minor (Not significant)**.

Cumulative Impact 5: Disturbance from vessels

439. There will be disturbance from construction vessels at all OWF screened into the cumulative assessment (**Table 9-2**). In addition to the OWFs, there is expected to be construction vessel activity associated with the construction of other offshore developments including subsea cables, offshore energy tidal and wave projects, coastal assets (**Table 9-3**).
440. It is extremely difficult to reliably quantify the level of increased disturbance to marine mammals resulting from increased vessel activity on a cumulative basis, given the large degree of temporal and spatial variation in vessel movements between projects and regions, coupled with the spatial and temporal variation in marine mammal movements across the region.
441. Although some OWF vessels (such as crew transport and supply vessels) may transit the wind farm at higher speeds, they often travel in repeated / predictable routes within the site. Many other vessels (e.g., jack-up vessels and pilot or attending vessels) travel more slowly within the wind farm site or

spend long periods of time jacked-up, at anchor (minimising movement and acoustic signature from engines) or using dynamic positioning systems (minimising movement, although still generating noise). Unfortunately, there are very few species-specific studies covering these vessel types that capture vessel movement patterns as well as their acoustic signatures and the corresponding response of marine mammals.

442. Vessel routes to and from offshore windfarms and other offshore projects will, for the majority, use existing vessel routes for pre-existing vessel traffic which marine mammals will be accustomed to. They may also have become habituated to the volume of regular vessel movements and therefore the additional risk is predominantly confined to construction sites. The vessel movements for offshore wind farms are likely to be limited and slow, resulting in less risk of disturbance to marine mammal receptors. In addition, as is the case for CWP, most projects are likely to adopt Ecological Vessel Management Plans (EVMPs), or comply with exiting Marine Wildlife Watching Codes) to minimise any potential effects on marine mammals, as this is considered standard mitigation across the offshore wind industry and complies directly with the relevant Irish guidance for managing vessel interactions with marine mammals.
443. Seismic surveys do not use existing vessel routes, so may risk adding vessel presence to novel areas; however, these are slow-moving and operate their own mitigation measures to protect marine mammals (while mitigating for PTS the mitigation measures will also reduce disturbance impacts). Therefore, increases in disturbance from vessels from offshore projects are likely to be small in relation to current and ongoing levels of shipping.
444. The cumulative impact of increased disturbance from vessels is predicted to be of local spatial extent, medium-term duration (vessel presence is expected throughout the construction phase), intermittent (vessel activity will not be constant) and reversible (disturbance effects are temporary). Therefore, the magnitude of vessel disturbance is considered to be **Low**, indicating that the potential is for short-term and / or intermittent behavioural effects, with survival and reproductive rates very unlikely to be impacted to the extent that the population trajectory would be altered. It is anticipated that any animals displaced from the area will return once vessels leave.
445. The sensitivity of all marine mammals to disturbance from vessel activity was assessed as **Low**.
446. Therefore, significance of the impact is assessed as **Minor (Not significant)**.

9.5.2 Operation and maintenance phase

Cumulative Impact 1: Disturbance from operational noise

447. All OWF projects that are currently operational are considered to be part of the existing baseline and will have continued impacts in the future at the same level as they did in the baseline. All OWF constructing from 2025 onwards will have future operational noise impacts that were not considered as part of the baseline.
448. As presented in the underwater noise modelling report (**Appendix 9-C Underwater Noise Modelling Assessment of the EIAR Addendum**), marine mammals may experience behavioural disturbance (using the precautionary level B harassment 120 dB SPL_{rms} threshold) within 190 m from an operational 25 GW wind geared-drive WTG at CWP. Similar disturbance impact ranges of <200 m have been predicted for Oriel, Morgan, Mona and Morecambe (Table 0.28), and most offshore OWFs scope operational noise out of assessment as they are unlikely to result in significant effects on marine mammals.

Table 9-25 Predicted disturbance ranges for operational noise at other OWF

OWF	Estimated disturbance range	Reference
Oriel	170 m (level B)	ORIEL WIND FARM PROJECT. Environmental Impact Assessment Report – Addendum. Chapter 10 Addendum: Marine Mammals and Megafauna (December 2025)
NISA	Scoped out of assessment	NISA Environmental Impact Assessment Report Volume 3: Offshore Chapters Chapter 14 Marine Mammal Ecology (2024)
Arklow Bank Phase 2	Scoped out of assessment	Arklow Bank Wind Park 2 Environmental Impact Assessment Report Volume II, Chapter 11: Marine Mammals (2024)
Dublin Array	Scoped out of assessment	Dublin Array Offshore Wind Farm. Environmental Impact Assessment Report. Volume 3, Chapter 5: Marine Mammals (2025)
Morgan	160 m (level B)	Morgan Offshore Wind Project: Generation Assets Environmental Statement Volume 2, Chapter 4: Marine Mammals (2024)
Mona	160 m (level B)	Mona Offshore Wind Project: Environmental Statement Volume 2, Chapter 4: Marine mammals (2024)
Awel y Mor	Scoped out of assessment	Awel y Môr Offshore Wind Farm. Category 6: Environmental Statement Volume 2, Chapter 7: Marine Mammals (2022)
Morecambe	100 m (TTS)	Morecambe Offshore Windfarm: Generation Assets Environmental Statement Volume 5 Chapter 11 Marine Mammals (2024)
Isle of Man (Moor Vannin)	No LSE identified at scoping	Moor Vannin Offshore Wind Farm. Scoping Report (2023)
Erebus	Scoped out of assessment	Project Erebus Environmental Statement Chapter 12: Marine Mammals (2021)

449. 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.*, 2018, Fernandez-Betelu *et al.*, 2024), which suggests that operational noise is unlikely to result in significant disturbance to these species. There are no data currently available on the presence of dolphin species or minke whales within operational OWFs.
450. The impact of underwater noise during the operational phase of all OWFs is considered to be localised to the very immediate vicinity of the WTGs. The effect of disturbance is expected to last less than a day, though the disturbance impact could occur across many years. It is unlikely to lead to the exclusion of animals within the OWF array areas, and therefore, at most, affecting a very small proportion of receptor population and without an alteration to population trajectories. This aligns with a **Low** magnitude score.
451. The sensitivity of harbour porpoise and dolphin species to disturbance from operational noise was assessed as **Very Low**. Therefore, significance of the impact is assessed as **Negligible (Not significant)**.
452. The sensitivity of minke whales and seals to disturbance from operational noise was assessed as **Low**. Therefore, significance of the impact is assessed as **Minor (Not significant)**.

Cumulative Impact 2: Disturbance from vessels

453. There will be disturbance from O&M vessels at all OWF screened into the cumulative assessment (**Table 9-2**). In addition to the OWFs, there is expected to be O&M vessel activity associated with the construction of other offshore developments including subsea cables, offshore energy tidal and wave projects, coastal assets (**Table 9-3**).

454. The cumulative impact from O&M vessel activity is assumed to be the same as during the construction phase. While the duration of impact is longer, the number of vessels expected on site during the O&M phase will be less than during construction. Additionally, vessel movements for offshore wind farms are likely to be limited and slow, resulting in less risk of disturbance to marine mammal receptors. In addition, most projects are likely to adopt VMPs (or comply with existing Marine Wildlife Watching Codes) to minimise any potential effects on marine mammals. The cumulative impact of increased disturbance from vessels is predicted to be of local spatial extent, long-term duration (vessel presence is expected throughout the lifespan of a windfarm), intermittent (vessel activity will not be constant) and reversible (disturbance effects are temporary). Therefore, the magnitude of vessel disturbance is considered to be **Low**, indicating that the potential is for short-term and / or intermittent behavioural effects, with survival and reproductive rates very unlikely to be impacted to the extent that the population trajectory would be altered. It is anticipated that any animals displaced from the area will return once vessels leave.
455. The sensitivity of all marine mammals to disturbance from vessel activity was assessed as **Low**.
456. Therefore, significance of the impact is assessed as **Minor (Not significant)**.

9.6 CEA summary

457. This CEA, which supports EIAR **Volume 3, Chapter 11 Marine Mammals** and the **EIAR Addendum** has assessed the potential cumulative effects on marine mammals from the construction and operation and maintenance phases of the CWP Project alongside other development.
458. **Table 9-26** below has been adopted from the PINS advice on CEA for NSIPs (PINS, 2024) as a means of summarising the potential adverse or beneficial cumulative effects of the CWP Project with other development. It summarises the outcomes of the detailed assessment provided above and sets out the proposed mitigation measures needed to address cumulative effects, if deemed necessary.
459. In summary, the CEA for marine mammals does not identify any significant cumulative effects resulting from the CWP Project alongside other developments.

Table 9-26 Summary of cumulative effects assessment

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
Construction phase				
Cumulative Impact 1: Disturbance from pre-construction surveys				
See Table 9-4	1, 2 and 3	Minor adverse (not significant in EIA terms)	No additional mitigation required	Minor adverse (not significant in EIA terms)
Cumulative Impact 2: Disturbance from UXO clearance				
See Table 9-5 to Table 9-8 Assessment assumes all developments will use low-order clearance methods.	1, 2 and 3	Minor adverse (not significant in EIA terms)	No additional mitigation required	Minor adverse (not significant in EIA terms)
Cumulative Impact 3: Disturbance from piling – WTGs and OSS				
See Table 0.3 Assumes all OWF in English, Welsh and Irish waters will use NAS/mitigation	Phase 1 Projects	Negligible to Minor adverse (not significant in EIA terms)	No additional mitigation required	Negligible to Minor adverse (not significant in EIA terms)
	1, 2 and 3	Minor adverse (not significant in EIA terms)	No additional mitigation required	Minor adverse (not significant in EIA terms)
Cumulative Impact 4: Disturbance from other construction activities				
See Table 9-5 to Table 9-8	1, 2 and 3	Minor adverse (not significant in EIA terms)	No additional mitigation required	Minor adverse (not significant in EIA terms)

Cumulative Impact 5: Disturbance from vessels

See Table 0.3 and Table 0.4 Assessment assumes all developments will adopt VMPs (or comply with exiting Marine Wildlife Watching Codes) to minimise any potential effects on marine mammals.	1, 2 and 3	Minor adverse (not significant in EIA terms)	No additional mitigation required	Minor adverse (not significant in EIA terms)

Operation and maintenance phase

Cumulative Impact 1: Disturbance from operational noise

See Table 0.3	1, 2 and 3	Negligible to Minor adverse (not significant in EIA terms)	No additional mitigation required	Negligible to Minor adverse (not significant in EIA terms)

Cumulative Impact 2: Disturbance from vessels

See Table 0.3 and Table 0.4 Assessment assumes all developments will adopt VMPs (or comply with exiting Marine Wildlife Watching Codes) to minimise any potential effects on marine mammals	1, 2 and 3	Minor adverse (not significant in EIA terms)	No additional mitigation required	Minor adverse (not significant in EIA terms)

9.7 References

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10 COMMERCIAL FISHERIES

10.1 Introduction

465. This section of the **CEA Report** presents the findings of the CEA for commercial fisheries, which considers the residual effects presented in **Volume 3, Chapter 12 Commercial Fisheries** alongside the potential effects of other proposed and reasonably foreseeable development. Cumulative effects are considered in this document across the construction and operation and maintenance phases of the CWP Project.
466. Updates to the project alone assessment for commercial fisheries as a consequence of the Commission's FIR are presented in Section 12 of the **EIAR Addendum**. This updated CEA incorporates relevant updates from the project alone assessment and has been updated in response to the requests made in item 5 Cumulative Impacts of the FIR.

10.2 Consultation

467. **Table 10-1** provides a summary of stakeholder and regulator feedback received during the consultation process that is relevant to the CEA for commercial fisheries.

Table 10-1 Consultation responses relevant to the CEA for commercial fisheries

Consultee	Comment	How issues have been addressed
Collaborative meetings between Phase One Developers: July 2025, October 2025 and November 2025 Marine Institute 7 November 2025	Discussion on the approach to collaboratively mitigating cumulative displacement.	Following discussions with other Phase One projects and MI, CWP Project will work with the other Phase One developers and the fishing industry to monitor displacement, including through early rollout of inshore VMS (iVMS) on selected vessels operating within and around the development area to enabling ongoing tracking of any redistribution of effort during construction and operation. To keep monitoring and interpretation transparent and robust, CWP Project and other Phase One developers will engage an independent scientific body (e.g., the Marine Institute and/or an academic institution) to design and lead the data collection and analysis. Further details are provided in the Fisheries Management and Mitigation Strategy (FMMS)

10.3 CEA impact screening

468. The first step in the CEA for commercial fisheries is the identification of which residual impacts assessed for the CWP Project alone have the potential for a significant cumulative impact with other development (described as 'impact screening'). This screening exercise is set out in **Table 10-2** below.
469. Potential impacts assessed in EIAR **Volume 3, Chapter 12 Commercial Fisheries** as minor or above are included in the CEA, however the following impacts have been excluded:
- Interference with fishing activities
 - Potential for snagging of gear
 - Increased steaming times to fishing grounds
470. The abovementioned impacts have been excluded on the basis of:
1. The highly localised nature of the impacts (i.e., they occur entirely within the project boundary only); and
 2. The Applicant's understanding that embedded management measures in place for the CWP Project will also be in place for other relevant projects, reducing the risk of a cumulative impact occurring.
471. Therefore, the impacts that are considered in the CEA during construction and operation and maintenance phases are as follows:
- Loss of grounds or restricted access to fishing grounds;
 - Displacement of fishing activity into other areas; and
 - Effects on commercially exploited species.
472. The potential impacts scoped into the CEA are summarised in **Table 10-2**.

Table 10-2 Impacts and potential for cumulative effect

Impact	CWP Project alone residual effect	Potential for significant cumulative effect – screened into the CEA (Yes / No)
Construction		
Loss of grounds or restricted access to fishing grounds	Minor	Yes
Displacement of fishing activity into other areas	Minor	Yes
Interference with fishing activities	Minor	No
Potential for snagging of gear	Minor	No
Increased steaming times to fishing grounds	Minor	No
Effects on commercially exploited species	Minor	Yes
Operation		

Impact	CWP Project alone residual effect	Potential for significant cumulative effect – screened into the CEA (Yes / No)
Loss of grounds or restricted access to fishing grounds	Minor	Yes
Displacement of fishing activity into other areas	Minor	Yes
Interference with fishing activities	Minor	No
Potential for snagging of gear	Minor	No
Increased steaming times to fishing grounds	Minor	No
Effects on commercially exploited species	Minor	Yes

Decommissioning

The detail and scope of the decommissioning works for the CWP Project will be determined by the relevant legislation and guidance at the time of decommissioning. Project alone impacts during the decommissioning phase of the CWP Project are assessed in EIAR **Volume 3, Chapter 12 Commercial Fisheries**. It is anticipated that the impacts will be no greater than those identified for the construction phase, and therefore no separate assessment of cumulative impacts during the decommissioning phase is presented within this CEA.

10.4 Stages 2 and 3: Information gathering and ‘other development’ screening

473. Stage 2 of the CEA is presented in **Appendix 1 of Part 1 of the CEA Report**. This exercise established a shortlist of other development for commercial fisheries using set screening criteria.
474. The shortlist of other development screened into the CEA for commercial fisheries at Stage 2 are listed below.
- SSE Renewables - Arklow Bank Wind Park 2 (OWF_01)
 - RWE - Dublin Array (OWF_02)
 - Statkraft - North Irish Sea Array (OWF_04)
 - Oriel Windfarm Limited, Parkwind NV, ESB - Oriel (OWF_06)
 - EnBW and BP - Mona (OWF_08)
 - RWE Renewables - Awel y Môr (OWF_09)
 - Unknown - Tonn Nua (OWF_11)
 - EnBW and BP - Morgan (OWF_15)
 - Orsted & Isle of Man Government - Isle of Man (Moor Vannin) (OWF_18)

- Cobra & Flotation Energy - Morecambe (OWF_19)
- Simply Blue Energy & Total Energy - Erebus Floating Wind Demo (OWF_23)
- EDF Renewables UK and ESB - Celtic Seas Round 5 PDA1 (Gwynt Glas) (OWF_27)
- North Channel Wind 2 - North Channel Wind 2 (OWF_29)
- Llyr 1 Cierco Ltd.,SBM Offshore N.V. - Llyr 1 (OWF_30)
- Llyr 2 Cierco Ltd.,SBM Offshore N.V. - Llyr 2 (OWF_31)
- Dublin Port Company - Dublin Port Company MP2 Project (CA_16)
- Dublin Port Company - Dublin Port Masterplan (3FM Plan) (CA_33)
- Irish Water - Greater Dublin Drainage Project consisting of a new wastewater treatment plant, sludge hub centre, orbital sewer, outfall pipeline and regional biosolids storage facility (CA_45)
- North Irish Sea Array Windfarm Limited - Site investigation activities to inform the development of the North Irish Sea Array (NISA) offshore windfarm (OWF) and export cable, off the coasts of counties Dublin, Meath and Louth. (SUR_24)
- Oriel Windfarm Ltd - Site investigation activities to inform the development of Oriel Windfarm Ltd (SUR_40)
- Eni UK / Liverpool Bay CCS Ltd - HyNet North West Industrial Cluster & Liverpool Bay CO₂ Storage (CS004A/B) (CCS_01)
- Dublin Port Company - Dredging permit S0024-02 (DAS_03)
- Dublin Port Company - Dredging permit S0004-03 (DAS_04)
- Dublin Port Company - Dredging permit S0033-01 (DAS_19)
- MaresConnect Limited - Mares Connect (SC_11)
- Eirgrid - Greenlink Interconnector (SC_20)
- Transmission Investment - LirlC Interconnector Project (SC_43)
- RTE / EIRGRID - Celtic Interconnector (SC_45)
- Microsoft - Telecommunications cable SOBR1 (SC_03)
- Microsoft - Telecommunications cable SOBR2 (SC_06)
- Microsoft - Telecommunications cable Tuskar (SC_17)

475. Information gathering (Stage 3 of the CEA) has enabled a further review of the other development shortlist for commercial fisheries, including a more detailed consideration of the location, nature and scale of the development, the timing of construction and operation activities, the information available to inform a CEA and the likelihood of a significant effect.
476. This information has been used to screen the Stage 2 shortlist to establish a final list of other development for detailed assessment at Stage 4 of the CEA. The results of the exercise are presented in **Table 10-3** below.

Table 10-3 Summary of other development screened into the CEA for commercial fisheries

Development	Distance from the array site (km)	Distance from the export cable corridor	Tier	Included in the CEA (Yes/No)	Rationale
Arklow Bank Wind Park 2 (OWF_01)	10	10	1	Yes	Potential overlap with commercial fisheries receptors based on operational range and fishing grounds targeted.
Dublin Array (OWF_02)	3	1	1	Yes	Potential overlap with commercial fisheries receptors based on operational range and fishing grounds targeted.
North Irish Sea Array (OWF_04)	51	36	1	Yes	Potential overlap with commercial fisheries receptors based on operational range and fishing grounds targeted.
Oriel (OWF_06)	84	62	1	Yes (O&M phase impacts only)	Potential overlap with commercial fisheries receptors based on operational range and fishing grounds targeted. No offshore construction phase overlap.
Mona (OWF_08)	125	129	1	No	No interaction with this project by receptors that may be affected by the CWP Project at a level that could lead to significant effects.
Awel y Môr (OWF_09)	129	133	1	No	No interaction with this project by receptors that may be affected by the CWP Project at a level that could lead to significant effects.
Tonn Nua (OWF_11)	136	141	3	Yes	Potential overlap with commercial fisheries receptors based on operational range and fishing grounds targeted.

Development	Distance from the array site (km)	Distance from the export cable corridor	Tier	Included in the CEA (Yes/No)	Rationale
Morgan (OWF_15)	141	144	1	No	No interaction with this project by receptors that may be affected by the CWP Project at a level that could lead to significant effects.
Isle of Man (Mooir Vannin) (OWF_18)	154	157	1	No	No interaction with this project by receptors that may be affected by the CWP Project at a level that could lead to significant effects.
Morecambe (OWF_19)	154	158	1	No	No interaction with this project by receptors that may be affected by the CWP Project at a level that could lead to significant effects.
Erebus Floating Wind Demo (OWF_23)	168	174	1	No	No interaction with this project by receptors that may be affected by the CWP Project at a level that could lead to significant effects.
Celtic Seas Round 5 PDA1 (Gwynt Glas) (OWF_27)	175	181	3	No	No interaction with this project by receptors that may be affected by the CWP Project at a level that could lead to significant effects.
North Channel Wind 2 (OWF_29)	178	163	3	No	No interaction with this project by receptors that may be affected by the CWP Project at a level that could lead to significant effects.
Llyr 1 (OWF_30)	182	188	1	No	No interaction with this project by receptors that may be affected by the CWP Project at a level that could lead to significant effects.
Llyr 2 (OWF_31)	184	190	3	No	No interaction with this project by receptors that may be affected by the CWP Project at a level that could lead to significant effects.

Development	Distance from the array site (km)	Distance from the export cable corridor	Tier	Included in the CEA (Yes/No)	Rationale
Dublin Port Company MP2 Project (CA_16)	25	4	1	No	No interaction with this project by receptors that may be affected by the CWP Project at a level that could lead to significant effects.
Dublin Port Masterplan (3FM Plan) (CA_33)	31	1	1	No	No interaction with this project by receptors that may be affected by the CWP Project at a level that could lead to significant effects.
Greater Dublin Drainage Project consisting of a new wastewater treatment plant, sludge hub centre, orbital sewer, outfall pipeline and regional biosolids storage facility (CA_45)	33	10	1	No	No interaction with this project by receptors that may be affected by the CWP Project at a level that could lead to significant effects.
Site investigation activities to inform the development of the North Irish Sea Array (NISA) offshore windfarm (OWF) and export cable, off the coasts of counties Dublin, Meath and Louth. (SUR_24)	62	42	1	Yes	Potential overlap with commercial fisheries receptors based on operational range and fishing grounds targeted.
Oriel Windfarm Ltd (SUR_40)	84	61	3	Yes	Potential overlap with commercial fisheries receptors based on operational range and fishing grounds targeted.
HyNet North West Industrial Cluster & Liverpool Bay CO ₂ Storage (CS004A/B) (CCS_01)	148	152	1	No	No interaction with this project by receptors that may be affected by the CWP Project at a level that could lead to significant effects.

Development	Distance from the array site (km)	Distance from the export cable corridor	Tier	Included in the CEA (Yes/No)	Rationale
Dredging permit S0024-02 (DAS_03)	23	4	1	No	No interaction with this project by receptors that may be affected by the CWP Project at a level that could lead to significant effects.
Dredging permit S0004-03 (DAS_04)	23	4	1	No	No interaction with this project by receptors that may be affected by the CWP Project at a level that could lead to significant effects.
Dredging permit S0033-01 (DAS_19)	23	4	1	No	No interaction with this project by receptors that may be affected by the CWP Project at a level that could lead to significant effects.
Mares Connect (SC_11)	43	20	3	Yes	Potential overlap with commercial fisheries receptors based on operational range and fishing grounds targeted.
Greenlink Interconnector (SC_20)	114	119	1	Yes	Potential overlap with commercial fisheries receptors based on operational range and fishing grounds targeted.
LirlC Interconnector Project (SC_43)	179	160	3	Yes	Potential overlap with commercial fisheries receptors based on operational range and fishing grounds targeted.
Celtic Interconnector (SC_45)	182	184	2	Yes	Potential overlap with commercial fisheries receptors based on operational range and fishing grounds targeted.
Telecommunications cable SOBR1 (SC_03)	27	1	3	Yes	Potential overlap with commercial fisheries receptors based on operational range and fishing grounds targeted.

Development	Distance from the array site (km)	Distance from the export cable corridor	Tier	Included in the CEA (Yes/No)	Rationale
Telecommunications cable SOBR2 (SC_06)	35	11	3	Yes	Potential overlap with commercial fisheries receptors based on operational range and fishing grounds targeted.
Telecommunications cable Tuskar (SC_17)	105	111	3	Yes	Potential overlap with commercial fisheries receptors based on operational range and fishing grounds targeted.

10.5 Stage 4: Assessment of cumulative effects

10.5.1 Receptors

477. The receptors assessed within the commercial fisheries and aquaculture CEA are consistent with the receptors identified for the CWP Project, as follows:

- Potting: whelk;
- Potting: crab and lobster;
- Dredge: mussel seed;
- Dredge: razor clam;
- Dredge: king scallop;
- Netting: Blonde ray, sole and mixed demersal;
- Beam trawl: sole and mixed flatfish;
- Demersal otter trawl: nephrops and mixed demersal;
- Pelagic trawl: sprat and herring;
- Charter angling; and
- Aquaculture.

10.5.2 Construction phase

Cumulative Impact 1: Loss or restricted access to established fishing grounds within the array site and OECC

Sensitivity – All Tiers

478. The sensitivity of the commercial fisheries receptors to CWP Project alone is summarised as Medium for the whelk, crab and lobster potting, mussel seed dredge, netting and charter angling receptors and Low for all other fisheries. These CWP Project alone sensitivity categories remains valid for the cumulative assessment for all Tiers. This is because receptor sensitivity is driven by intrinsic characteristics of each fleet and fishery, particularly operational range, reliance on local grounds and the availability of alternative fishing areas, which do not change when additional projects are considered. While cumulative effects may increase the magnitude or spatial extent of loss of access where projects overlap key fishing grounds, they do not alter the underlying ability of each receptor to adapt or recover, and therefore do not change the sensitivity ranking.

Magnitude - Tier 1

479. The Tier 1 assessment includes Arklow Wind Park 2 OWF, Dublin Array OWF, NISA OWF and site investigations and the Greenlink Interconnector.

480. The CWP Project is located within established whelk grounds targeted by Irish potting vessels. Concern has been raised during consultation with the commercial fishing industry related to cumulative effects of the Phase 1 OWF developments, specifically noting the close proximity of Dublin Array (approx. 2.5 km from CWP Project) and therefore feasibly targeted by the same vessels.

481. For NISA and Arklow Bank Phase 2, significant effects (pre-mitigation) were identified for various commercial fisheries receptors active across these sites; notably demersal otter trawl targeting *Nephrops* within the NISA array area and potters targeting whelk across the Arklow Bank Phase 2

export cable corridor. Mitigation packages have been proposed for both NISA and Arklow Bank Phase 2 in the form a series of measures and commitments within respective project Fisheries Mitigation and Management Strategies (FMMSs), which lower the residual impact to 'not significant' in EIA terms. Overall, effective implementation of project-level mitigation will minimise the cumulative impact across multiple Tier 1 projects during the construction, operational and decommissioning phases.

482. The impact assessment results for loss of access to commercial fisheries due to Dublin Array, Arklow Phase 2 and NISA OWFs, and the Greenlink Interconnector are summarised in **Table 10-4**, including proposed additional mitigation where relevant.
483. Overall, it is assumed that where significant impacts occur, these will be appropriately mitigated at a Project level, and therefore the magnitude of impact and sensitivity of receptors is considered to be no more than that assessed for CWP Project alone impacts for all fishing fleets.
484. Therefore, the impact magnitude of reduced access, or exclusion from established grounds from the installation of the CWP Project cumulatively with the Tier 1 projects is no higher than the residual magnitude of the CWP Project in isolation, i.e., Low for whelk, crab and lobster potting, mussel seed dredge, scallop dredge, demersal netting and charter angling receptors and Very low for all other receptors.

Table 10-4 Summary of commercial fisheries impact assessment findings for Phase 1 offshore wind farms included in the Tier 1 cumulative assessment

Project	Capacity	Loss of grounds or restricted access to fishing grounds	
		Array Area	OECC
Dublin Array	824 MW; 39 or 50 WTGs with fixed foundations; Array site area of 59 km ²	Minor adverse /negligible for all fleets during all phases, except: Moderate adverse for potters targeting whelk during all phases. Additional mitigation: FMMS; justifiable evidence based disruption agreements; monitoring of catch per unit effort; gear trials	Minor adverse /negligible for all fleets during all phases, except: Moderate adverse for potters targeting whelk and crab and lobster during construction and decommissioning. Additional mitigation: FMMS; justifiable evidence based disruption agreements.
Arklow Bank Phase 2	800 MW; 56 or 47 WTGs with fixed foundations; Array site area of 63 km ²	Slight adverse / not significant for all fleets during all phases.	Slight adverse / not significant for all fleets during all phases, except: Moderate adverse for potters targeting whelk and crab and lobster during construction and decommissioning. Additional mitigation: Cooperation agreements and associated payments.
North Irish Sea Array	500 MW; 49 or 35 WTGs with fixed foundations; Array site area of 88.5 km ²	Slight adverse for all fleets during all phases, except: Very significant for Irish demersal otter trawlers during construction and decommissioning and significant during operation; and Moderate for UK demersal otter trawlers during all phases.	Slight adverse for all fleets during all phases, except: Significant for Irish demersal otter trawlers, potting and razor dredgers during construction; and Moderate for UK demersal otter trawlers during construction.

Project	Capacity	Loss of grounds or restricted access to fishing grounds	
		Array Area	OECC
		Additional mitigation: FMMS including Sustainable Fisheries Community.	Additional mitigation: FMMS including Sustainable Fisheries Community.
Greenlink Interconnector	500 MW capacity subsea and underground cable of approx. 190 km distance	Slight adverse for all fleets during all phases	Slight adverse for all fleets during all phases

Magnitude - Tiers 2 and 3

485. When assessed cumulatively with the Tier 2 and 3 projects set out in **Table 10-3** the impact magnitude is considered to be no more than that assessed for Tier 1 impacts which is Low for whelk, crab and lobster potting, mussel seed dredge, scallop dredge, demersal netting and charter angling receptors and Very low for all other receptors. This is because the effects from Tier 2 and 3 projects will not exceed those resulting from the Tier 1 projects based on location of the fisheries. Accordingly, the overall cumulative magnitude remains unchanged from the Tier 1 assessment, with Tier 2 and 3 projects not materially increasing loss of access beyond the same core fishing areas already captured.

Significance of effect

486. For whelk, crab and lobster potting, mussel seed dredge, netting and charter angling: the magnitude of the impact is deemed to be Low adverse and the sensitivity of the receptor is considered to be Medium. The effect will therefore be of Minor (adverse) significance, which is not significant in EIA terms.
487. For scallop dredge: the magnitude of the impact is deemed to be Low adverse and the sensitivity of the receptor is considered to be Low. The effect will therefore be of Minor (adverse) significance, which is not significant in EIA terms.
488. For all other receptors: the magnitude of the impact is deemed to be Very low and the sensitivity of the receptor is considered to be Low. The effect will therefore be of Negligible significance, which is **not significant** in EIA terms.

Cumulative Impact 2: Displacement of fishing activity into other areas

Sensitivity – All Tiers

489. The sensitivity of the commercial fisheries receptors to CWP Project alone is summarised as Medium for the whelk, crab and lobster potting, mussel seed dredge, netting and charter angling receptors and Low for all other fisheries. These CWP Project alone sensitivity categories remains valid for the cumulative assessment for all Tiers. This is because receptor sensitivity is driven by intrinsic

characteristics of each fleet and fishery, particularly operational range, reliance on local grounds and the availability of alternative fishing areas, which do not change when additional projects are considered. While cumulative effects may increase the magnitude or spatial extent of displacement where projects overlap key fishing grounds, they do not alter the underlying ability of each receptor to adapt or recover, and therefore do not change the sensitivity ranking.

Magnitude - Tier 1

- 490. The Tier 1 assessment includes Arklow Wind Park 2 OWF, Dublin Array OWF, NISA OWF and site investigations and the Greenlink Interconnector.
- 491. The magnitude of impact from CWP alone displacement effects is summarised as Low for all receptors.
- 492. When assessed cumulatively with the Phase 1 Projects the impact of the magnitude is considered to increase to Medium for the whelk and crab and lobster potting fisheries. The Phase 1 Projects are considered to have a similar individual, but additive contribution to cumulative magnitude impacts related to displacement, specifically for potting vessels targeting whelk, crab and lobster. These vessels will be displaced into areas already targeted for these species, leading to increased competition for space and increased pressure on the whelk, crab and lobster resources. Displacement occurring across multiple projects is difficult to attribute to a specific project. Mitigation at individual project level is recognised as effective for mitigating the impact of loss of fishing grounds, however, these displaced vessels are likely to seek alternative grounds, leading to increased competition. It is noted that the CWP Project alone impacts were not significant, however notwithstanding this, an overall cumulative Medium magnitude is assessed due to multiple Phase 1 Projects construction impacts within the defined whelk, crab and lobster fishing grounds which could lead to displacement into areas with existing high effort.
- 493. Displacement patterns are likely to reflect established fisher behaviour and decision-making. Fishers typically operate on preferred grounds that align with their target species, gear type, seasonal expectations, and proven catch history; where access to these preferred grounds is restricted, effort is expected to redistribute first to secondary grounds selected through a combination of local knowledge, habitual operating patterns, weather windows, safety considerations, and distance/steaming time from port. The extent to which this redistributed effort can be absorbed within normal spatial and temporal variation, without increasing competition or resource pressure, is inherently difficult to predict or model with confidence. The EIA is therefore precautionary in identifying a potential Medium magnitude in cumulative displacement across Tier 1 projects, based on an assumption of concurrent construction activity across multiple developments within the same broad fishing grounds.
- 494. For the other fisheries, the impact of the magnitude is considered to be no more than the CWP Project alone i.e., Low. This is due to the low contribution of the Project to any potential loss of access to other fishing fleets and thereby displacement is not anticipated at a cumulative level.
- 495. Overall, the cumulative magnitude of the impact is deemed Medium for the whelk, crab and lobster potting fisheries, and Low for all other receptors.

Magnitude - Tiers 2 and 3

- 496. When assessed cumulatively with Tier 2 and 3 projects set out in **Table 10-3** the magnitude is considered to be no more than that assessed for Tier 1 impacts. This is because the effects from Tier 2 and 3 projects will not exceed those resulting from the Tier 1 projects based on location of the fisheries. Accordingly, the overall cumulative magnitude remains unchanged from the Tier 1

assessment, with Tier 2 and 3 projects not materially increasing displacement beyond the same core fishing areas already captured.

Significance of effect

497. For whelk, crab and lobster potting: the magnitude of the impact is deemed to be Medium adverse and the sensitivity of the receptor is considered to be Medium. The effect will therefore be of Moderate (adverse) significance, which is significant in EIA terms, prior to implementation of mitigation. This assessment is precautionary based on the assumed concurrent construction programme across multiple projects.
498. For mussel seed dredge, netting and charter angling: the magnitude of the impact is deemed to be Low adverse and the sensitivity of the receptor is considered to be Medium. The effect will therefore be of Minor (adverse) significance, which is not considered to be significant in EIA terms.
499. For all other receptors: the magnitude of the impact is deemed to be Low and the sensitivity of the receptor is considered to be Low. The effect will therefore be of Minor (adverse) significance, which is considered to be **not significant** in EIA terms.

Additional Mitigation

500. CWP Project acknowledges the importance of considering cumulative impacts across the Irish Sea.
501. Each individual Phase 1 Project is actively addressing potential construction-phase impacts through project-level disruption protocols. In addition, with no legislation in Ireland that prohibits fishing activity within operational wind farm sites, it is considered that fishing will resume within the array areas and across the export cable corridors upon completion of construction. There is international experience, particularly in the UK, demonstrating that both static and mobile fishing can and does resume within operational arrays, subject to safety and navigation protocols. The Applicants therefore maintain that fishing access will continue in the Irish Phase One OWF sites once operational.
502. Nonetheless, recognising the concerns expressed by some stakeholders and prescribed bodies, and in the spirit of transparency, good governance, and co-existence, the Applicants jointly commit to the following actions, which are aimed at evidencing, monitoring, and addressing any unanticipated cumulative displacement effects that may emerge. The below mitigation is also described in the updated **FMMS** submitted with the Applicant's FIR response.

1. Collaborative monitoring through iVMS deployment

503. The Applicants propose to work in collaboration with the Marine Institute and the fishing industry to support the proactive implementation of inshore Vessel Monitoring Systems (iVMS) on selected fishing vessels operating in and around the development areas. This initiative will:
 - Enable real-time and long-term monitoring of fishing patterns, both within the array areas and cable corridor areas, as well as in neighbouring grounds;
 - Provide essential baseline data ahead of construction, against which future displacement or redistribution of fishing effort during construction and operation can be compared;
 - Be implemented through voluntary participation, targeting a representative spread of vessel sizes and fishing methods, particularly those not currently mandated to carry VMS;
 - The Marine Institute's existing scheme for the provision of free iVMS units will be utilised to support uptake, and the Applicants will facilitate outreach and coordination through Company Fisheries Liaison Officers.

504. This is in line with the '*next steps*' outlined in the Seafood ORE Working Group's annual report.

2. Independent scientific oversight and research commitment

505. To ensure that monitoring and assessment of potential displacement impacts are carried out in a transparent and evidence-based manner, the Applicants propose to collaborate with an independent scientific body, such as the Marine Institute and/or an independent academic partner, to lead on the design, delivery, and interpretation of data collection and analysis. This partnership will help ensure neutrality and scientific credibility in the evaluation of fishing patterns and co-existence outcomes. As part of this commitment, the Applicants will explore the feasibility of undertaking a research project (e.g., a funded doctoral studentship or independent scientific research programme) focused on investigating potential cumulative displacement effects of offshore renewable energy developments. The research will aim to improve the understanding of spatial interactions between fisheries and offshore infrastructure and provide a knowledge base for future policy development and mitigation strategies.

3. Cumulative and holistic consideration

506. The Applicants acknowledge the need to address cumulative impacts arising from multiple offshore renewable energy developments in the Irish Sea and are committed to taking a holistic, collaborative approach. The Applicants currently and will continue to actively participate in cross-project coordination forums, including the Seafood /ORE Working Group and will seek to share data, align monitoring efforts, and contribute to broader understanding of displacement patterns. Furthermore, the applicant is open to exploring the development of shared mitigation mechanisms, subject to agreed frameworks and evidence of material impact.

4. Addressing cumulative impacts should they arise

507. In the event that cumulative displacement impacts are identified through the evidence base of iVMS, the Applicants propose the following short-term approach for the construction phase.

Short-term: Construction phase impacts

508. Construction activities can cause temporary disruption to fishing operations, particularly within array areas and cable route corridors. If monitoring and engagement confirm that short-term displacement has occurred, this will be addressed at the project level through individually managed mechanisms. These includes application of the mitigation defined for the project-alone loss of access impact, as defined in the FMMS:
- CWP will endeavour to enter into reasonable, justifiable and evidence-based co-operation agreements with affected fishermen at an individual level who can demonstrate a legitimate economic dependency on the CWP Project offshore development area wherever possible.
 - If a mutually agreed settlement is not reached, then both parties should see to review and follow the Seafood/ORE Working Group Dispute Resolution Mechanism Guidance;
 - In addition, details of the construction programme will be clearly communicated, allowing where feasible, temporary coordination of access or scheduling works in consultation with the fishing industry to minimise peak conflict.

Residual Effect

509. With application of the additional mitigation, the residual cumulative effect of displacement of whelk, crab and lobster potting commercial fisheries is lowered to Minor (adverse) significance, which is **not significant** in EIA terms.

Cumulative Impact 3: Effects on commercially exploited species

Sensitivity – All Tiers

510. The sensitivity of the commercial fisheries receptors to the CWP Project alone is summarised as Medium for the whelk, crab and lobster potting, mussel seed dredge, scallop dredge and charter angling receptors and Low for all other fisheries. These CWP Project alone sensitivity categories remains valid for the cumulative assessment for all Tiers. This is because sensitivity in this assessment reflects the susceptibility of the target species and associated fishing activity to disturbance and disruption within the affected grounds. Potting and dredge receptors targeting largely sedentary or slow-moving benthic species (e.g. whelk, crab/lobster, mussel seed and scallop) are inherently less able to avoid or move away from temporary disturbance, and disruption within key grounds can therefore directly affect availability and catchability, contributing to a Medium sensitivity classification. For charter angling, sensitivity reflects the potential for behavioural responses of target fish (e.g. avoidance or altered distribution) that may reduce catch rates and the quality of the angling experience, rather than mortality effects. By contrast, mobile finfish receptors and fleets with greater capacity to target alternative species and grounds are less susceptible to disruption at the scale of the CWP Project and are therefore considered Low sensitivity, and these intrinsic susceptibility factors remain applicable in the cumulative context across all Tiers.

Magnitude - Tier 1

511. The CWP Project alone was predicted to have a Low magnitude for all fisheries based on the assessment of effects on commercially exploited species.
512. The cumulative effects for fish and shellfish ecology have been assessed in **Section 6** covering the following effects during the construction phase:
- Temporary habitat loss;
 - Increased suspended sediment concentrations and associated sediment deposition;
 - Injury and/or disturbance to fish and shellfish from underwater noise and vibration; and
 - Accidental pollution.
513. When assessed cumulatively with the Tier 1 projects the impact on fish and shellfish ecology during construction are assessed to be of imperceptible to slight adverse significance. This conclusion for fish and shellfish ecology receptors reflects that the relevant construction-phase effect pathways (temporary habitat loss, sediment disturbance, underwater noise and vibration, and accidental pollution) are localised and temporary in nature, with limited spatial overlap and no expectation of significant wider-scale effects on commercially exploited fish and shellfish populations. As the commercial fisheries assessment draws on and carries forward these conclusions in relation to commercially exploited species, the magnitude of effect on commercial fisheries resources is therefore assessed as Low for all receptors.

Magnitude - Tiers 2 and 3

514. When assessed cumulatively with the Tiers 2 and 3 projects set out in **Table 10-3** the magnitude of impact on commercial fisheries resources is considered to be no greater than that assessed for Tier 1. This reflects the fish and shellfish ecology cumulative assessment, which identifies imperceptible to slight adverse construction-phase effects, and therefore supports a Low magnitude for commercial fisheries receptors. In addition, the spatial relationship between the Tier 2 and 3 projects and the key commercially exploited species and fishing grounds considered in the Tier 1 assessment means these projects do not add materially to the area or intensity of disturbance already captured under Tier 1. Accordingly, the overall cumulative magnitude remains Low for all receptors, unchanged from the Tier 1 assessment.

Significance of effect

515. For whelk, crab and lobster potting, mussel seed dredge, scallop dredge and charter angling; the magnitude of the impact is deemed to be Low and the sensitivity of the receptor is considered to be Medium. The effect will therefore be of Minor (adverse) significance, which is considered to be **not significant** in EIA terms.
516. For all other receptors: the magnitude of the impact is deemed to be Low and the sensitivity of the receptor is considered to be Low. The effect will therefore be of Minor (adverse) significance, which is considered to be **not significant** in EIA terms.

10.5.3 Operation and maintenance phase

Cumulative Impact 1: Loss or restricted access to established fishing grounds within the array site and OECC

Sensitivity – All Tiers

517. The sensitivity of the commercial fisheries receptors is the same as assessed for construction, summarised as Medium for the whelk, crab and lobster potting, mussel seed dredge, netting and charter angling receptors and Low for all other fisheries.

Magnitude - Tier 1

518. For the operational and maintenance phase, it is anticipated that commercial fishing activity will resume within and around offshore wind farm array areas and OECC, supported by standard marine coexistence practice and the absence of construction-related seabed disturbance. On this basis, the impact magnitude of reduced access, or exclusion from established grounds from the installation of the CWP Project cumulatively with the Phase 1 projects and Tier 1 interconnector is no higher than the residual magnitude of the CWP Project in isolation, i.e., Low for whelk, crab and lobster potting, mussel seed dredge, scallop dredge, demersal netting and charter angling receptors and Very low for all other receptors.

Magnitude - Tiers 2 and 3

519. When assessed cumulatively with the Tiers 2 and 3 projects set out in **Table 10-3**, the overall cumulative magnitude remains unchanged from the Tier 1 assessment, with Tier 2 and 3 projects not materially increasing loss of access beyond the same core fishing areas already captured.

Significance of effect

520. For whelk, crab and lobster potting, mussel seed dredge, netting and charter angling; the magnitude of the impact is deemed to be Low adverse and the sensitivity of the receptor is considered to be Medium. The effect will therefore be of Minor (adverse) significance, which is considered to be **not significant** in EIA terms.
521. For all other receptors; the magnitude of the impact is deemed to be Low and the sensitivity of the receptor is considered to be Low. The effect will therefore be of Minor (adverse) significance, which is considered to be **not significant** in EIA terms.

Cumulative Impact 2: Displacement of fishing activity into other areas

Sensitivity – All Tiers

522. The sensitivity of the commercial fisheries receptors is the same as assessed for construction, summarised as Medium for the whelk, crab and lobster potting, mussel seed dredge, netting and charter angling receptors and Low for all other fisheries.

Magnitude - Tier 1

523. For the operational and maintenance phase, it is anticipated that commercial fishing activity will resume within and around offshore wind farm array areas and across buried export cables, supported by standard marine coexistence practice. As a result, any displacement is expected to be limited, localised and temporary (e.g. associated with short-duration maintenance activities), rather than sustained redistribution of fishing effort to alternative grounds.
524. On this basis, the magnitude of effect associated with O&M is assessed as Low for all commercial fisheries receptors, and no material cumulative effect is anticipated across the Tier 1 projects.
525. Accordingly, the cumulative assessment assumes that fishing access is maintained during O&M, and that any localised or temporary restrictions associated with maintenance activities that may lead to displacement are short-term and managed through standard procedures and communications. Therefore, the magnitude of impact from displacement during O&M for the CWP Project cumulatively with the Tier 1 projects is no greater than the residual magnitude for CWP Project alone, and is assessed as Low for all receptors.
526. To confirm, the CWP Project is confident that coexistence will support resumption of fishing within the Tier 1 OWF array areas and offshore export cables and this position supports a Low magnitude.
527. It is, however, recognised that uncertainty remains regarding the extent of fishing resumption within array areas, and therefore the CWP Project proposes to extend monitoring undertaken during the construction phase, into the O&M phase. This is described further in the Additional Mitigation section below.

Magnitude - Tiers 2 and 3

528. When assessed cumulatively with the Tier 2 and 3 projects set out in **Table 10-3**, the overall cumulative magnitude remains unchanged from the Tier 1 assessment, with Tier 2 and 3 projects not materially increasing displacement.

Significance of effect

529. For whelk, crab and lobster potting, mussel seed dredge, netting and charter angling: the magnitude of the impact is deemed to be Low adverse and the sensitivity of the receptor is considered to be Medium. The effect will therefore be of Minor (adverse) significance, which is considered to be **not significant** in EIA terms.
530. For all other receptors: the magnitude of the impact is deemed to be Low and the sensitivity of the receptor is considered to be Low. The effect will therefore be of Minor (adverse) significance, which is considered to be **not significant** in EIA terms.

Additional Mitigation

Addressing cumulative impacts should they arise

531. In the event that cumulative displacement impacts are identified through the evidence base of iVMS, the Applicants propose the following approach for the medium- to long-term operation and maintenance (O&M) phase.

Medium–long term: O&M phase impacts

532. For the O&M phase, the CWP project is confident that co-existence will allow resumption of fishing within the array during the operational phase and this position supports a Low magnitude (see **Appendix 12-A Evidence of fishing within OWF array areas** to the FIR Response document). Where evidence indicates that current fishing methods cannot be effectively or safely deployed within the operational site, CWP 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.
533. As detailed in the updated **FMMS**, if monitoring indicates evidence of cumulative displacement, CWP are 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, CWP cannot commit to detailed, collaborate cumulative mitigation measures at this stage. Instead, CWP will keep the requirement for cumulative mitigation under review and, if monitoring and evidence demonstrate significant cumulative displacement during the O&M phase, will work collaboratively to develop and implement proportionate measures at the appropriate time.

Residual effect

534. The residual effect remains of Minor (adverse) significance, which is considered to be **not significant** in EIA terms, for all commercial fisheries receptors.

Cumulative Impact 3: Effects on commercially exploited species

Sensitivity – All Tiers

535. The sensitivity of the commercial fisheries receptors to the CWP Project alone is summarised as Medium for the whelk, crab and lobster potting, mussel seed dredge, scallop dredge and charter angling receptors and Low for all other fisheries.

Magnitude - Tier 1

536. The cumulative effects for fish and shellfish ecology have been assessed in Section 6 covering the following effects during the operation and maintenance phase:
- Increased suspended sediment concentrations and associated sediment deposition;
 - Injury and/or disturbance to fish and shellfish from underwater noise and vibration;
 - Accidental pollution;
 - Long term habitat loss;
 - Alterations of seabed habitats arising from changes in physical processes; and
 - Temporary Changes in Electromagnetic Fields (EMF) from subsea electrical cabling.
537. When assessed cumulatively with the Tier 1 projects set out in **Table 10-3**, the impact on fish and shellfish ecology during construction are assessed to be of imperceptible to slight adverse significance. Therefore the magnitude of effect to commercial fisheries resources is assessed as Low for all commercial fishery fleets.

Magnitude - Tiers 2 and 3

538. When assessed cumulatively with the Tier 2 and 3 projects set out in **Table 10-3**, the overall cumulative magnitude remains unchanged from the Tier 1 assessment, with Tier 2 and 3 projects not materially increasing disruption to commercial resources.

Significance of effect

539. For whelk, crab and lobster potting, mussel seed dredge, scallop dredge and charter angling: the magnitude of the impact is deemed to be Low and the sensitivity of the receptor is considered to be Medium. The effect will therefore be of Minor (adverse) significance, which is not considered to be significant in EIA terms.
540. For all other receptors: the magnitude of the impact is deemed to be Low and the sensitivity of the receptor is considered to be Low. The effect will therefore be of Minor (adverse) significance, which is not considered to be significant in EIA terms.

10.6 CEA summary

541. This CEA, which supports EIAR **Volume 3, Chapter 12 Commercial Fisheries**, and the **Section 12** of the **EIAR Addendum** has assessed the potential cumulative effects on commercial fisheries from the construction and operation and maintenance phases of the CWP Project alongside other development.

542. **Table 10-5** below has been adopted from the PINS advice on CEA for NSIPs (PINS, 2024) as a means of summarising the potential adverse or beneficial cumulative effects of the CWP Project with other development. It summarises the outcomes of the assessment provided above and sets out the proposed mitigation measures to address cumulative effects, where required.
543. In summary, the CEA for commercial fisheries does not identify any residual significant cumulative effects resulting from the CWP Project alongside other development.

Table 10-5 Summary of cumulative effects assessment

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
Construction phase				
Cumulative Impact 1: Loss or restricted access to established fishing grounds within the array site and OECC				
OWF_01, OWF_02, OWF_04, OWF_11, OWF_29, SUR_24, SUR_40, SC_11, SC_20, SC_43, SC_35, SC_03, SC_06, SC_17	1,2 and 3	Minor adverse (not significant in EIA terms)	No additional mitigation required	Minor adverse (not significant in EIA terms)
Cumulative Impact 2: Displacement of fishing activity into other areas				
OWF_01, OWF_02, OWF_04, OWF_11, OWF_29, SUR_24, SUR_40, SC_11, SC_20, SC_43, SC_35, SC_03, SC_06, SC_17	1,2 and 3	Potting (whelk, crab and lobster): Moderate adverse (significant in EIA terms) All other receptors: Minor adverse (not significant in EIA terms)	Potting (whelk, crab and lobster): Monitoring of displacement and updates to FMMS where evidence indicates a material displacement effect.	Minor adverse (not significant in EIA terms)
Cumulative Impact 2: Effects on commercially exploited species				
OWF_01, OWF_02, OWF_04, OWF_11, OWF_29, SUR_24, SUR_40, SC_11, SC_20, SC_43, SC_35, SC_03, SC_06, SC_17	1,2 and 3	Minor adverse (not significant in EIA terms)	No additional mitigation required	Minor adverse (not significant in EIA terms)
Operation and maintenance phase				
Cumulative Impact 1: Loss or restricted access to established fishing grounds within the array site and OECC				
OWF_01, OWF_02, OWF_04, OWF_06, OWF_11, OWF_29, SUR_24, SUR_40, SC_11, SC_20, SC_43, SC_35, SC_03, SC_06, SC_17	1,2 and 3	Minor adverse (not significant in EIA terms)	No additional mitigation required	Minor adverse (not significant in EIA terms)
Cumulative Impact 2: Displacement of fishing activity into other areas				
OWF_01, OWF_02, OWF_04, OWF_06, OWF_11, OWF_29, SUR_24, SUR_40, SC_11, SC_20, SC_43, SC_35, SC_03, SC_06, SC_17	1,2 and 3	Minor adverse (not significant in EIA terms)	Commitment to continue monitoring of displacement for potting (whelk, crab and lobster) and updates to FMMS where evidence indicates a material displacement effect.	Minor adverse (not significant in EIA terms)
Cumulative Impact 2: Effects on commercially exploited species				
OWF_01, OWF_02, OWF_04, OWF_06, OWF_11, OWF_29, SUR_24, SUR_40, SC_11, SC_20, SC_43, SC_35, SC_03, SC_06, SC_17	1,2 and 3	Minor adverse (not significant in EIA terms)	No additional mitigation required	Minor adverse (not significant in EIA terms)

10.7 References

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11 OFFSHORE BATS

11.1 Introduction

553. This section of the **CEA Report** presents the findings of the CEA for Offshore Bats, which considers the residual effects presented in **Volume 3, Chapter 13 Offshore Bats** alongside the potential effects of other proposed and reasonably foreseeable development. Cumulative effects are considered in this document across the construction, and operation and maintenance phases of the CWP Project.
554. The detail and scope of the decommissioning works for the CWP Project will be determined by the relevant legislation and guidance at the time of decommissioning. Project alone impacts during the decommissioning phase of the CWP Project are assessed in EIAR **Volume 3, Chapter 13 Offshore Bats**. It is anticipated that the impacts will be no greater than those identified for the construction phase, and therefore no separate assessment of cumulative impacts during the decommissioning phase is presented within this CEA.
555. Updates to the project alone assessment for offshore bats as a consequence of the Commission's FIR are presented in **Section 13** of the **EIAR Addendum**. This updated CEA incorporates relevant updates from the project alone assessment and has been updated in response to the requests made in item 5 of the FIR.

11.2 Consultation

556. Stakeholder feedback received during the consultation process that is relevant to the offshore bat impact assessment is provided in **Volume 3, Chapter 13 Offshore Bats** of the EIAR.
557. No feedback specific to the CEA for offshore bats has been received at the pre-application stage. Stakeholder feedback on the CEA in response to the CWP Project planning application has been responded to in the **FIR Response Document** and the **Observations Response Document**, including confirmation of any updates made in response to the feedback received.

11.3 CEA impact screening

558. The first step in the CEA for offshore bats is the identification of which residual impacts assessed for the CWP Project alone have the potential for a cumulative impact with other development (described as 'impact screening'). This screening exercise is set out in **Table 11-1** below.
559. Only potential impacts assessed in EIAR **Volume 3, Chapter 13 Offshore Bats** as 'negligible' or above are included in the CEA (i.e. those assessed as 'imperceptible' are not taken forward as there is no potential for them to contribute to a cumulative effect).

Table 11-1 Potential impacts scoped into the assessment.

Impact	CWP Project alone residual effect	Potential for significant cumulative effect – screened into the CEA (Yes / No)
Construction		
Disturbance	Negligible - Not significant	Yes
Artificial lighting	Negligible - Not significant	Yes
Operation		
Collision	Negligible - Not significant	Yes
Disturbance	Negligible - Not significant	Yes
Lighting	Negligible - Not significant	Yes
Decommissioning		
Disturbance	The detail and scope of the decommissioning works for the CWP Project will be determined by the relevant legislation and guidance at the time of decommissioning. Project alone impacts during the decommissioning phase of the CWP Project are assessed in Chapter 13 Offshore Bats . It is anticipated that the impacts will be no greater than those identified for the construction phase, and therefore no separate assessment of cumulative impacts during the decommissioning phase is presented within this CEA.	
Lighting		

11.4 Stage 3: Information gathering and ‘other development’ screening

560. Stage 2 of the CEA is presented in **Appendix 1** of **Part 1** of the **CEA Report**. This exercise established a shortlist of other development for offshore bats using set screening criteria.
561. The shortlist of other development screened into the CEA for offshore bats at Stage 2 are listed below.
- SSE Renewables - Arklow Bank Wind Park 2 (OWF_01).
 - Sure Partners Limited / SSE Renewables - Arklow Bank Phase 2 OWF (CA_30).
 - RWE - Dublin Array (OWF_02).
 - Statkraft Ireland - North Irish Sea Array OWF (OWF_04).
 - Parkwind NV - Oriel (OWF_06).
 - Dublin Port Company - Dredging and Dumping at Sea arising from the Dublin Harbour Capital Dredging Project (DAS_19).
 - Dublin Port Company - MP2 Project (CA_16).
 - EnBW and BP - Mona (OWF_08).
 - EnBW and BP - Awel-y-Mor (OWF_09).

- Unknown - Tonn Nua (OWF_11).
- RWE Npower - Rhyl Flats (OWF_12).
- RWE - Gwynt y Mor (OWF_13).
- EnBW and BP - North Hoyle (OWF_17).
- Orsted & Isle of Man Government - Isle of Man (Mooir Vannin) (OWF_18).
- Cobra & Flotation Energy - Morecambe (OWF_19).
- Ørsted - Burbo Bank Extension (OWF_20).
- Ørsted - Walney Extension 3 (OWF_21).
- Walney Extension Limited - Walney Extension 4 (OWF_22).
- Simply Blue Energy & Total Energy - Erebus Floating Wind Demo (OWF_23).
- Ørsted - Burbo Bank (OWF_24).
- Ørsted - Walney 1 (OWF_28).
- North Channel Wind 2 - North Channel Wind 2 (OWF_29).
- Llyr 1 Cierco Ltd.,SBM Offshore N.V. - Llyr (OWF_30).
- Llyr 2 Cierco Ltd.,SBM Offshore N.V. - Llyr 2 (OWF_31).
- Vattenfall - Ormonde (OWF_32).
- EDF Renewables UK and ESB - Barrow (OWF_33).
- EDF Renewables UK and ESB - Celtic Seas Round 5 PDA1 (OWF_27).
- EDF Renewables UK and ESB - Celtic Seas Round 5 PDA2 (OWF_34).
- Equinor - Celtic Seas Round 5 PDA3 (OWF_37).
- North Channel Wind 1 - North Channel Wind 1 (OWF_35).
- White Cross Flotation Energy plc, Cobra Instalaciones Y Servicios, S.A. - White Cross (OWF_36).
- Dublin Port Company - 3FM Project (CA_33).
- Dublin Port Company - Maintenance Dredging in Dublin Port (CA_40/DAS_04).
- Irish Water - Greater Dublin Drainage Project (CA_45).
- Dublin Port Company - Dumping at Sea arising from capital dredging works under the MP2 Project (DAS_03).

562. Information gathering (Stage 3 of the CEA) has enabled a further review of the other development shortlist for offshore bats, including a more detailed consideration of the location, nature and scale of the development, the timing of construction and operation activities, the information available to inform a CEA and the likelihood of a significant effect.
563. This information has been used to screen the Stage 2 shortlist to establish a final list of other development for detailed assessment at Stage 4 of the CEA. The results of the exercise are presented in **Table 11-2** below.
564. Projects screened-in are those which may impact the same populations of bats particularly in relation to those foraging or migrating. Therefore, projects which may affect the same migratory pathway between the Republic of Ireland and west coast of Wales are screened in. Projects outwith this area are considered unlikely to be within the same migratory pathway as bats are generally assumed to take the shortest routes when in the offshore environment and avoid long distance of exposed crossings as detailed in the **EIAR Addendum**.

Table 11-2 Summary of other development screened into the CEA for offshore bats

Development	Distance from the array site (km)	Distance from the export cable corridor (km)	Tier	Included in the CEA (Yes/No)	Rationale
Ref: OWF_01 Project: Arklow Bank Wind Park 2 Developer: SSE Renewables Planning Ref: OA27.319864	9.3	17.6	1	Yes	Submitted in 2000 with no onshore or offshore bat data, in the absence of data the cumulative effects cannot be quantitatively assessed. However, a non-quantitative CEA will be undertaken due to the proximity of the OWF and similarity of effects.
Ref: CA_30 Project: Arklow Bank Phase 2 OWF Developer: Sure Partners Limited / SSE Renewables Planning Ref: 2022-MAC-002	30.8	33.1	1	Yes	The project is south of the CWP development in the same potential migratory pathway, therefore potential cumulative impact exists as development will have all the same impacts as CWP. The Offshore Bats chapter includes data collected from a monopile within the Arklow Bank Wind Park Array Area in 2021 and 2022 as well as headlands data from 2023. The monopile surveys recorded Leisler's and common pipistrelle bats in the offshore environment in both 2021 and 2022.
Ref: OWF_02 Project: Dublin Array Developer: RWE Planning Ref: OA06D.321992	2.8	0	1	Yes	The project is north of the CWP development in the same potential migratory pathway. The bat survey results from Dublin Array OWF have been included in Chapter 13 Offshore Bats and as such cumulative effects can be assessed.
Ref: OWF_04 Statkraft Ireland	51	35.7	1	Yes	The project is north of the CWP development in the same potential migratory pathway,

Development	Distance from the array site (km)	Distance from the export cable corridor (km)	Tier	Included in the CEA (Yes/No)	Rationale
North Irish Sea Array OWF (CEA-0094) Planning Ref: 2022-MAC-005					therefore potential cumulative impact exists as development will have all the same impacts as CWP. The Offshore Bats EIA Chapter was submitted with the 2022 surveys at Rockabill, a vessel survey from 2022 and headlands surveys from 2022 and 2023. Further surveys were proposed for 2024 but at the time of writing (March 2026) no information from the 2024 surveys is available. The 2024 survey findings have therefore not been included in the CEA. The 2022 surveys at Rockabill recorded Leisler's bat, Nathusius' pipistrelle, soprano pipistrelle and common pipistrelle bat passes.
Ref: OWF_06 Project: Oriel Developer: Parkwind NV Planning Ref: OA15.319799	83.9	61.6	1	Yes – operation only	The project is north of the CWP development in the same potential migratory pathway, therefore potential cumulative impact exists as development will have all the same impacts as CWP. The Offshore Bats EIA included results from four static bat detectors deployed on a vessel undertaking geophysical surveys over 22 nights in 2022. A further 12 nights were surveyed in autumn 2024 and nine additional nights were surveyed in Spring 2025 no bat activity was recorded while offshore during the surveys excepting when the vessel was alongside or anchored in harbour. Oriel OWF is anticipated to be construction prior to the commencement of construction for CWP and

Development	Distance from the array site (km)	Distance from the export cable corridor (km)	Tier	Included in the CEA (Yes/No)	Rationale
					given the distance between the projects, cumulative impacts associated with construction (disturbance and increased lighting) are not considered likely.
Ref: DAS_19 Project: Dredging and Dumping at Sea arising from the Dublin Harbour Capital Dredging Project Developer: Dublin Port Company Planning Ref: S0033-01 and FS007164	23.2	3.7	1	No	The 2021 EIAR does not mention any onshore or offshore bat surveys. The dredging project is anticipated to be complete in 2029, the year before CWP would commence construction therefore no construction phase impacts are likely.
Ref: CA_16 Project: MP2 Project Developer: Dublin Port Company Planning Ref: PA29N.304888	25.1	4.2	1	Yes - construction only	The 2020 EIA included details of onshore bat activity surveys undertaken in 2018 and 2019. No bat activity or bat roosts were recorded in the onshore project area. No offshore bat surveys / assessment was conducted. However given the proximity of the works to the proposed cable route and the temporal overlap there is the potential for construction phase cumulative effects.
Ref: OWF_08 Project: Mona Developer: EnBW and BP Planning Ref: N/A	125.1	128.7	1	No	The 2025 EIA report did not include Offshore Bats, and no offshore surveys were undertaken. Mona is north of Wales and therefore, not considered to be within the same potential migratory pathway and so there is no potential for cumulative effects.
Ref: OWF_09	129.4	133.3	1	No	The 2022 EIA report did not include Offshore Bats.

Development	Distance from the array site (km)	Distance from the export cable corridor (km)	Tier	Included in the CEA (Yes/No)	Rationale
Project: Awel-y-Mor Developer: EnBW and BP Planning Ref: N/A					Awel-y-Mor is north of Wales and therefore, not considered to be within the same potential migratory pathway and so there is no potential for cumulative effects.
Ref: OWF_11 Project: Tonn Nua Developer: Unknown Planning Ref: N/A 3c	135.7	141.3	3	No	No information on bats available as part of the MAC application, the application is to the South of Ireland and so it is not within the same potential migratory pathway and therefore there is no potential for cumulative effects.
Ref: OWF_12 Project: Rhyl Flats Developer: RWE Npower Planning Ref:	138.4	142.5	1	No	The 2002 EIA did not include any reference to bats and as Rhyl Flats OWF, is north of Wales, and therefore it is not considered to be within the same potential migratory pathway. Furthermore, the wind farm has been operational since 2009 and so is considered part of the baseline. Therefore, there is no potential for cumulative effects.
Ref: OWF_13 Project: Gwynt y Mor Developer: RWE Planning Ref:	140.3	144.2	1	No	The 2005 EIA did not include any reference to bats and Gwynt-y-Mor is north of Wales and therefore it is not considered to be within the same potential migratory pathway. Furthermore, the wind farm has been operational since 2015 and so is considered part of the baseline. Therefore, there is no potential for cumulative effects.
Ref: OWF_15 Project: Morgan Developer: EnBW and BP	141.2	143.9	1	No	The 2024 EIA did not include any reference to offshore bats. Morgan, is north of Wales and therefore it is not considered to be within the

Development	Distance from the array site (km)	Distance from the export cable corridor (km)	Tier	Included in the CEA (Yes/No)	Rationale
Planning Ref: N/A					same potential migratory pathway and so there is no potential for cumulative effects.
Ref: OWF_17 Project: North Hoyle Developer: EnBW and BP Planning Ref:	153.2	157.2	1	No	The 2001 EIA did not include any reference to bats and North Hoyle is north of Wales it is therefore not considered to be within the same potential migratory pathway. Furthermore, the wind farm has been operational since 2003 and so is considered part of the baseline. Therefore, there is no potential for cumulative effects.
Ref: OWF_18 Project: Isle of Man (Mooir Vannin) Developer: Orsted & Isle of Man Government Planning Ref: N/A	154.2	156.7	1	No	The 2025 EIA does not include any reference to offshore bats, and it is off the east coast of the Isle of Mann and therefore, it is not considered to be within the same potential migratory pathway and so there is no potential for cumulative effects.
Ref: OWF_19 Project: Morecambe Developer: Cobra & Flotation Energy Planning Ref: N/A	154.4	157.9	1	No	The 2023 EIA did not include any reference to offshore bats. Morecambe OWF is north of Wales, and therefore, it is not considered to be within the same potential migratory pathway and so there is no potential for cumulative effects.
Ref: OWF_20 Project: Burbo Bank Extension Developer: Ørsted Planning Ref:	162.0	166.0	1	No	The 2010 EIA did not include any reference to offshore bats. Burbo Bank Extension is north of Wales, and therefore, it is not considered to be within the same potential migratory pathway and so there is no potential for cumulative effects.

Development	Distance from the array site (km)	Distance from the export cable corridor (km)	Tier	Included in the CEA (Yes/No)	Rationale
Ref: OWF_21 Project: Walney Extension 3 Developer: Ørsted Planning Ref:	163.3	166.1	1	No	The 2006 EIA does not include any reference to offshore bats. Walney Extension 3 is off the east coast of the Isle of Mann and therefore, it is not considered to be within the same potential migratory pathway and so there is no potential for cumulative effects.
Ref: OWF_22 Project: Walney Extension 4 Developer: Walney Extension Limited Planning Ref:	165.9	168.8	1	No	The 2014 EIA does not include any reference to offshore bats, and Walney Extension 4 is off the east coast of the Isle of Mann and therefore, it is not considered to be within the same potential migratory pathway and so there is no potential for cumulative effects.
Ref: OWF_23 Project: Erebus Floating Wind Demo Developer: Simply Blue Energy & Total Energy Planning Ref:	167.9	173.9	1	No	The 2021 EIA does not include any reference to offshore bats. Erebus is southwest of Wales and therefore, it is not considered to be within the same potential migratory pathway and so there is no potential for cumulative effects.
Ref: OWF_24 Project: Burbo Bank Developer: Ørsted Planning Ref:	171.6	175.6	1	No	Submitted in 2002 with no onshore or offshore bat data, in the absence of data the cumulative effects cannot be quantitatively assessed. In addition, Burbo bank is north of Wales, and therefore, not considered to be within the same potential migratory pathway and so there is no potential for cumulative effects.
Ref: OWF_28 Project: Walney 1 Developer: Ørsted	176.2	179.4	1	No	Submitted in 2006 with no onshore or offshore bat data, in the absence of data the cumulative effects cannot be quantitatively assessed. In

Development	Distance from the array site (km)	Distance from the export cable corridor (km)	Tier	Included in the CEA (Yes/No)	Rationale
Planning Ref:					addition, Walney is off the east coast of the Isle of Mann and therefore, not considered to be within the same potential migratory pathway and so there is no potential for cumulative effects.
Ref: OWF_29 Project: North Channel Wind 2 Developer: North Channel Wind 2 Planning Ref: N/A	177.6	162.7	3	No	The submitted scoping report does not include mention of offshore bat, in addition North Channel Wind is off the east coast of Northern Ireland and therefore not in the same migration pathway, therefore there is no potential for cumulative effects.
Ref: OWF_30 Project: Llyr 1 Developer: Llyr 1 Cierco Ltd.,SBM Offshore N.V. Planning Ref:	181.5	187.8	1	No	Submitted in 2024 with no offshore bat data, in the absence of data the cumulative effects cannot be quantitatively assessed. Llyr is southwest of Wales and therefore not considered to be within the same migration pathway, therefore there is no potential for cumulative effects.
Ref: OWF_31 Project: Llyr 2 Developer: Llyr 2 Cierco Ltd.,SBM Offshore N.V. Planning Ref:	183.8	190.4	3	No	Scoping submitted in 2024 did not mention offshore bat data, in the absence of data the cumulative effects cannot be quantitatively assessed. Llyr is southwest from Wales and therefore it is not considered to be within the same migration pathway, therefore there is no potential for cumulative effects.
Ref: OWF_32 Project: Ormonde Developer: Vattenfall	184.5	187.6	1	No	The 2005 EIA does not include any reference to offshore bats. Ormonde OWF is off the west coast of England and therefore, it is not

Development	Distance from the array site (km)	Distance from the export cable corridor (km)	Tier	Included in the CEA (Yes/No)	Rationale
Planning Ref:					considered to be within the same potential migratory pathway and so there is no potential for cumulative effects.
Ref: OWF_33 Project: Barrow Developer: EDF Renewables UK and ESB Planning Ref:	186.3	189.7	1	No	The 2002 EIA does not include any reference to offshore bats. Barrow OWF is north of Wales, and therefore, it is not considered to be within the same potential migratory pathway and so there is no potential for cumulative effects.
Ref: OWF_27 Project: Celtic Seas Round 5 PDA1 (Gwynt Glas) Developer: EDF Renewables UK and ESB Planning Ref: N/A	175.3	181.1	3	No	No EIA undertaken to date, in the absence of data the cumulative effects cannot be quantitatively assessed. The Celtic Seas project is south of Wales and therefore it is not considered to be within the same potential migratory pathway and so there is no potential for cumulative effects.
Ref: OWF_34 Project: Celtic Seas Round 5 PDA2 Developer: Ocean Winds Planning Ref:	198.6	204.5	3	No	No EIA undertaken to date, in the absence of data the cumulative effects cannot be quantitatively assessed. The Celtic Seas project is south of Wales and therefore it is not considered to be within the same potential migratory pathway and so there is no potential for cumulative effects.
Ref: OWF_37 Project: Celtic Seas Round 5 PDA3 Developer: Equinor Planning Ref:	219.4	225.6	3	No	No EIA undertaken to date, in the absence of data the cumulative effects cannot be quantitatively assessed. The Celtic Seas project is south of Wales and therefore it is not considered to be within the same potential

Development	Distance from the array site (km)	Distance from the export cable corridor (km)	Tier	Included in the CEA (Yes/No)	Rationale
					migratory pathway and so there is no potential for cumulative effects.
Ref: OWF_35 Project: North Channel Wind 1 Developer: North Channel Wind 1 Planning Ref: N/A	202.1	183.9	3	No	The submitted scoping report does not include mention of offshore bats. North Channel Wind is off the east coast of Northern Ireland and therefore it is not considered to be within the same migration pathway, therefore there is no potential for cumulative effects.
Ref: OWF_36 Project: White Cross Developer: White Cross Flotation Energy plc, Cobra Instalaciones Y Servicios, S.A. Planning ref:	207.5	213.9	1	No	The 2023 EIA does not include any reference to offshore bats. White Cross OWF is south of Wales, and therefore, it is not considered to be within the same potential migratory pathway and so there is no potential for cumulative effects.
Ref: CA_33 Project: 3FM Project Developer: Dublin Port Company Planning Ref: PA29N.320250	31.3	0.6	1	Yes – construction only	The 2024 EIA included details of onshore bat activity surveys undertaken in 2022 and 2024. No bat roosts were recorded in the onshore project area however Leisler's bat, common pipistrelle and soprano pipistrelle bats were recorded in the activity surveys. No offshore bat surveys/ assessment was conducted however given the proximity of the works to the proposed cable route there is the potential for construction phase cumulative effects.
Ref: CA_40 / DAS_04 Project: Maintenance Dredging in Dublin Port	32.2	0.8	1	No	No onshore or offshore bat surveys were submitted. The project timelines do not align, as the dredging works are due to be completed prior to the commencement of construction for

Development	Distance from the array site (km)	Distance from the export cable corridor (km)	Tier	Included in the CEA (Yes/No)	Rationale
Developer: Dublin Port Company Planning Ref: FS007132 and S0004-03					CWP, therefore there are no potential cumulative effects.
Ref: CA_45 Project: Greater Dublin Drainage Project Developer: Irish Water Planning Ref: PL06F.314488	33.1	9.9	1	No	No onshore or offshore bat surveys were submitted and given the distance between the proposed developments as well as the different potential impacts from the projects (the Greater Dublin Drainage project is a wastewater treatment plant sludge hub centre, orbital sewer, outfall pipeline and regional biosolids storage facility) no cumulative effects are anticipated.
Ref: DAS_03 Project: Dumping at Sea arising from capital dredging works under the MP2 Project Developer: Dublin Port Company Planning Ref: S0024-02	23.2	3.7	1	Yes – construction only	No onshore or offshore bat surveys were submitted. However given the proximity of the works to the proposed cable route and the temporal overlap, with the dredging works forecast as being undertaken throughout the construction of the CWP project, there is the potential for construction phase cumulative effects.

11.5 Stage 4: Assessment of cumulative effects

11.5.1 Construction phase

Cumulative Impact 1: Disturbance

565. Under Irish law it is an offence to disturb, injure or kill all species of bats or disturb or destroy their roosts. Disturbance of bats while in flight is not well studied, however, bats are assumed to avoid human activity while out of the roost and avoid construction activities; excepting where they opportunistically make use of them, for instance by resting on vessels during migration. Bats are known to forage out at sea, particularly within harbours and coastal waters, and so any increases in activity at night or additional structures upon which bats could potentially roost has the potential to impact bats. Projects with overlapping construction routes and time frames are likely to impact the same species or even individuals, as such the potential for cumulative impacts is recognised.
566. The potential construction phase disturbance impact to offshore bats associated with the CWP Project is limited to disturbance of opportunistically resting bats while at sea during the four year (2030 – 3033) construction phase of the CWP OWF. Therefore, the impact would affect individuals of relatively common species.
567. The number and species of bats which rest or roost while migrating or foraging at sea are unknown therefore the CEA is based on current knowledge, results from the baseline surveys and professional judgement. Of the species which may be found at sea, the following sensitivity has been assigned based on the parameters set out in EIAR **Volume 3, Chapter 13 Offshore Bats Table 13-25**:
- Common pipistrelle – low;
 - Soprano pipistrelle – low;
 - Nathusius' pipistrelle – medium;
 - Leisler's bat – low; and
 - Daubenton's bat – low.
568. No bat roosts have been reported within the publicly available information for the projects identified in **Table 11-2**. However, the North Irish Sea Array EIAR highlights the potential for a common and soprano pipistrelle roost on Rockabill island. Rockabill island is over 50 km north of the CWP array site and therefore outside the area likely to be impacted by the construction phase disturbance. The lack of confirmed roosts identified within the project EIARs would indicate that any disturbance impacts would be limited to individuals while opportunistically roosting and therefore would be negligible.
569. Only impacts which will temporally overlap with the construction phase of the CWP Project are considered to have potential for cumulative impacts with construction phase disturbance from the CWP Project. As all the projects screened in have anticipated construction timelines which overlap with the construction of CWP or are already built, and therefore, have potential vessel movements or infrastructure on which bats may rest, all have been screened into this impact. Though the cumulative impact of those which use different harbours for maintenance / construction and those over 10 km from the CWP Project will likely not be on the same individuals, the same migratory population may be impacted.
570. In terms of Tier 1 projects; there are no publicly available records of bats being found roosting or otherwise resting on the seven operational turbines at Arklow Bank Phase 1 OWF, therefore no additional effects associated with construction phase disturbance impacts are anticipated as any bats roosting on WTGs will be sufficiently distant as to be unaffected by construction within the CWP Array area.

571. Dublin Port 3FM Project and MP2 Projects are predicted to be active in the vicinity of the CWP offshore development area until 2029 and 2032 respectively. These, works will be undertaken 24/7 until complete and as such there will be vessels at night upon which bats could rest, thereby being at risk from disturbance. Additionally, the dumping at sea arising from capital dredging works under the MP2 Project will be undertaken until 2035, this will also increase the vessel movements in the area and the potential for nighttime vessels upon which bats could rest.
572. Construction of Dublin Array OWF is anticipated to coincide with construction of CWP, lasting for four years from 2030-2033. As such there will be an overlap of four years in the construction phases and potential impacts on the same population. Arklow Bank Phase 2 OWF would involve the addition of 100 turbines to the operational seven turbine Arklow Bank OWF. These would be constructed in 2027–2031 which would overlap with the CWP construction programme by two years. The proposed 30–36 turbine North Irish Sea Array OWF is also predicted to be constructed in 2028–2030.
573. The low numbers of potentially migratory or foraging bats potentially impacted during the construction of CWP would also potentially be impacted by the nearby developments. Quantified information on the number of bats potentially affected is available for CWP and Dublin Array OWF. The number of bat passes recorded at Dublin Array OWF are similar to those recorded for the CWP baseline, with both having low levels of activity associated with potential offshore activity, as shown in EIAR **Volume 3, Chapter 13 Tables 13-D, 13-E and 13-18**. There is also publicly available data for Oriel, North Irish Sea Array and Arklow Bank Phase 2 which though not directly comparable with the CWP and Dublin Array datasets also recorded low levels of offshore activity. When combined, the activity levels potentially associated with offshore activity remains low. As such, less than one per cent of the Irish population of each species potentially found offshore would be affected and the favourable conservation status of the species unaffected.
574. Allowing for the short-term nature of the impacts during the temporally overlapping construction phase, with the CWP construction phase anticipated to take four years (2030 – 2033), and the very low number of bats anticipated to be affected (individuals in each instance), no measurable changes to the population of any bat species is anticipated from disturbance on any of the projects and the overall cumulative magnitude of the impact would be **negligible magnitude**. In line with the matrix for determination of significance of effect EIAR **Volume 3, Chapter 13 Table 13-9**, with the low–medium sensitivity of the receptors, this would result in a **not significant** cumulative impact.
575. There are no Tier 2 or 3 projects of relevance, or for which there is adequate information to undertake a meaningful assessment. As such, there are anticipated to be no significant cumulative effects with CWP cumulatively with Tier 2 or 3 projects; the same conclusion being drawn for Tier 1, Tier 2, and Tier 3 combined.

Cumulative Impact 2: Lighting

576. The impacts of lighting on bats on land is relatively well studied. Different species including *Myotis* species are considered 'light-shy' and tend to avoid areas of white or green lights; while *Pipistrellus* species are more abundant in the same lights (Spoelstra *et al.*, 2017). Though different research found Nathusius' pipistrelles not to be affected by artificial lighting, with no differences in the number of passes recorded on lights which are lit all night and those with only part night lighting (Azam *et al.*, 2015). Lights are also known to draw different invertebrates towards them and thereby away from areas used by light-shy species, thus benefitting more light tolerant species. The extent to which this will affect bats foraging and migrating offshore is unknown, including evaluating habitat suitability. However, as the area south of Dublin Port, the cable route corridor and vessel route, is already well used by vessels the level of baseline intermittent / transient artificial lighting here is assumed to be relatively high.

577. As bats may use the first 10 km out at sea to forage, any changes in this area could affect foraging bats, favouring more light tolerant species while limiting areas available for light-shy species such as Daubenton's. Such changes within 10 km include the increase in vessels at night using lights to navigate, as well as the increase in lit structures.
578. Only impacts which will overlap temporally with the construction phase of the CWP Project are considered to have potential for cumulative impacts with construction phase disturbance from the CWP Project. As all the projects screened in have anticipated construction timelines which overlap with the construction of CWP or are already built, and therefore have potential vessel movements or infrastructure on which bats may rest, they have all been screened into this impact. However, the cumulative impact of those which use different harbours for maintenance / construction and those over 10 km from the CWP Project will likely not be on the same individuals, and therefore the same migratory population will not be impacted.
579. Of the species recorded, the only light-shy species that may forage offshore is Daubenton's bat. Daubenton's was recorded in very low numbers for both the CWP baseline (shown in EIAR **Volume 3, Chapter 13 Tables 13-D, 13-E and the EIAR Addendum**) and the Dublin Array OWF baseline (shown in **Chapter 13 Table 13-18**). Combining the activity recorded for both baselines, Daubenton's bat activity remains low.
580. Tier 1 project Arklow Bank Phase 1 is already operational, with aviation lighting on at least two WTGs, though the level of nightly vessel movements, and the impacts associated with nightly lighting are not publicly available.
581. Other Tier 1 projects; Dublin Array OWF is 10 km from the shore. As such it is at the edge of the potential foraging zone and artificial lighting relating to the offshore WTGs may affect light sensitive foraging bats in addition to migratory bats. Impacts associated with Dublin Array OWF on bats during construction were assessed as negligible within the EIAR chapter. Arklow Bank OWF Phase 2 would be 6 km from the shore, while the North Irish Sea Array OWF would be approximately 12.5 km from the shore. All three proposed OWFs are also due to overlap temporally with construction of CWP and due to location could potentially affect bats using a similar migratory route to the one potentially impacted by CWP. Oriel OWF is scheduled to finish construction in 2028 (two years prior to the commencement of construction for CWP) and so the night-time vessel movements in the area will reduce before construction commences on CWP, there will, however, be impacts associated with aviation lighting. All potentially migratory species (common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle and Leisler's bats) are all considered to be relatively light tolerant species (Spoelstra *et al.*, 2017, Azam *et al.*, 2015) however impacts of lighting on bats during migration is unknown.
582. The construction phase impacts, are short-term, lasting at most for the five-year construction window of CWP. Though the area of impact is increased during the two-year overlap in construction of the projects.
583. Lights are known to draw different invertebrates towards them and thereby away from areas used by light-shy species, thus benefitting more light tolerant species. However, the area is already well lit, with high levels of offshore vessel traffic. As such, the impacts of offshore lighting on offshore bats from Tier 1 projects would be indistinguishable from the current baseline and annual variation. The magnitude of the cumulative impact, considering the low level of recorded bat activity in the near shore and harbours is considered to be **negligible**. In line with the matrix for determination of significance of effect EIAR **Volume 3, Chapter 13 Table 13-9**, due to the low-medium sensitivity for all species, would result in a **not significant** cumulative impact. There are no Tier 2 or Tier 3 projects of relevance, or for which there is adequate information to undertake a meaningful assessment. As such, there are anticipated to be no significant cumulative effects with CWP cumulatively with Tier 3 projects; the same conclusion being drawn for Tier 1, Tier 2, and Tier 3 combined.

11.5.2 Operation and maintenance phase

Cumulative Impact 1: Disturbance

584. The susceptibility of bats to disturbance during exposed roosting and legal status of roosts is outlined in Construction Phase Cumulative Impact 1: Disturbance. Though considered unlikely, it is possible that bats will roost on the vessels or the WTGs. Combining the existing and proposed turbines from all relevant developments listed in **Table 11-2** gives a total of up to 293 offshore WTGs. This increases the opportunities for roosting and subsequent disturbance. The extent to which bats may rest on WTGs and 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 / wind turbines. Such reports are often associated with migration, though could also be from bats foraging offshore or otherwise blown offshore by wind. Most observations of bats at sea including resting on vessels / offshore structures are of individuals, roosting or otherwise resting (Petersen *et al.*, 2014). The North Irish Sea Array EIAR highlights the potential for a common and soprano pipistrelle roost on Rockabill island. Rockabill island is over 50 km north of the CWP array site and therefore outside the area likely impacted by the operational phase disturbance.
585. The proximity of the proposed Tier 1 project OWFs screened in within **Table 11-2** to the CWP Project means that the same populations of bats would likely be affected and as such they have been included within this CEA. Of the species potentially encountered in the area, Nathusius' pipistrelle have the lowest population in Ireland (estimated to be 4,100–6,900 individuals across Ireland (Bat Conservation Ireland, 2024)), this is reflected within the species sensitivity. Of the species which may be found at sea, the following sensitivity has been assigned based on the parameters set out in EIAR **Volume 3, Chapter 13 Offshore Bats Table 13-7**:
- Common pipistrelle – low;
 - Soprano pipistrelle – low;
 - Nathusius' pipistrelle – medium;
 - Leisler's bat – low; and
 - Daubenton's bat – low.
586. Where individuals are disturbed, the favourable conservation status of the species would not be at risk as less than one per cent of the population would be affected. Publicly available references to bats roosting on offshore WTGs are scarce, though in part this is thought to be due to the lack of recording. Therefore, the combined effects to disturbance of the above bat species while roosting or otherwise resting on offshore infrastructure associated with OWFs, from all the proposed projects with a combined number of between 251–293 WTGs, would remain indistinguishable from the baseline and thereby are **negligible** in magnitude. Therefore operational phase disturbance would result in a **not significant** cumulative impact, the same conclusion being drawn for all Tier 1 projects combined.
587. There are no Tier 2 or Tier 3 projects of relevance, or for which there is adequate information to undertake a meaningful assessment. As such there are anticipated to be no significant cumulative effects with CWP cumulatively with Tier 3 projects; the same conclusion being drawn for Tier 1, Tier 2, and Tier 3 combined.

Cumulative Impact 2: Collision

588. Bats are known to collide with onshore wind turbines and as such they are considered at risk of collision with offshore turbines, with different species assessed at different risks low–high (Rodrigues *et al.*, 2015) of collision. However, the comparability between onshore and offshore collision rate has never been studied due to the difficulties in carcass retrieval offshore. In addition, some research suggests

that the flight heights of different species vary during migration, to take advantage of favourable tailwinds. With flights at greater heights (above 40 m) putting migratory species within the rotor sweep zone and therefore at greater risk of collision with WTGs compared to onshore bats.

589. As an increase in WTGs within the area would increase the potential for collision, all OWF projects screened in within **Table 13-2** have been considered in this CEA. The proximity of the above OWFs to the CWP Project means that the same populations of bats would likely be affected. The sensitivity of the receptors as set out in **Chapter 13** are low for all potentially offshore species, excepting Nathusius' pipistrelle which is considered to be medium (known to migrate and considered widespread but not common). As bats are not anticipated to collide with stationary structures no non-OWF projects have been included within this CEA.
590. The combined number of WTGs across all projects is up to 293. Looking at the species sensitivity to impacts (low–medium) and the low level of potentially migratory activity recorded for CWP and Dublin Array OWF as shown in EIAR **Volume 3, Chapter 13 Tables 13-D, 13-E and 13-18**, the magnitude of effect is considered to be low for all species considered migratory (Nathusius' pipistrelle, common pipistrelle, soprano pipistrelle and Leisler's). Oriel and Dublin Array concluded no significant effect from collision or barotrauma.
591. Bats were recorded (six passes) within the proposed Arklow Bank Wind Park extension and potential collision / barotrauma impacts on foraging bats were considered significant. Given the distance between Arklow Bank and the CWP array site (9.3 km) it is possible the same population of foraging bats would be impacted. However, Arklow Bank phase 2 would be at closest 6 km from the shore compared to CWP's 13- 22 km, therefore the CWP Array Site is considered less suitable for use by foraging bats due to the increased distance of exposed flight (13 km across open sea) necessary to reach the Array Site. The potential for foraging within the CWP Array Site has not been discounted and will be monitored as outlined within the **IPPEMP**.
592. NISA concluded potential likely significant effects on the potential bat population resident on Rockabill however no significant effect on migratory or foraging populations of bats outside the potential Rockabill population of common and soprano pipistrelle bats. Rockabill is over 50 km north of the CWP array site and therefore the WTGs at CWP are not anticipated to impact the potential Rockabill bat population of common and soprano pipistrelle bats.
593. The magnitude of collision impact for migratory bats for all identified OWF is considered to be negligible / low.
594. There are no confirmed migratory routes between Ireland and the UK. As it is likely that routes are dependent on weather conditions and wind direction at the time of migration, migrating bats may take a different route each time. Due to the variability in migratory routes and the separation of the projects, no individual bats are anticipated to be impacted by multiple developments. Although groups of up to 12 common pipistrelles have been recorded flying over the North Sea (Petersen *et al.*, 2014), it is accepted that most European bats typically migrate individually. As a result, if bats do collide with turbines it is likely to be on an individual basis. The boat-based surveys within the CWP Array Site recorded no bats outside of the harbour, the numbers of bats anticipated to migrate through the OWFs are expected to be low therefore, there are no population level impacts anticipated, and it is considered that the favourable conservation status of each species will be maintained. In line with **Chapter 13 Table 13-9**, the cumulative impact would be of **slight significance** for all species considered migratory (Nathusius' pipistrelle, common pipistrelle, soprano pipistrelle and Leisler's bats). This reflects the increased potential for this impact as a result of the additional WTGs.
595. The CWP Project will undertake bat monitoring with a view to implementing mitigation measures if appropriate through an agreed approach of adaptive management. It is assumed other projects will undertake a similar approach to monitoring of offshore bat activity and collisions. Provided adaptive management is undertaken, the frequency of such collisions would reduce and so would the magnitude

of impact, resulting in a negligible residual impact. This would reduce the cumulative impact to **not significant** for Tier 1 projects, with the same conclusion being drawn for Tier 1 and Tier 2 combined.

596. There are no Tier 2 or Tier 3 projects of relevance, or for which there is adequate information to undertake a meaningful assessment. As such, there are anticipated to be no significant cumulative effects with CWP cumulatively with Tier 2 or Tier 3 projects; the same conclusion being drawn for Tier 1, Tier 2 and Tier 3 combined.

Cumulative Impact 3: Lighting

597. As outlined in the construction impacts, lights are known to draw different invertebrates towards them and thereby away from areas used by light-shy species, thus benefitting more light tolerant species. The only light-shy species which may forage offshore and would therefore be affected by this impact is Daubenton's bats. Daubenton's were recorded in very low numbers for both the CWP baseline and the Dublin Array OWF baseline.
598. It is assumed that all OWF projects, screened in within **Table 13-2**, will require some level of aviation lighting, which has the potential to affect bats during migration, all species which may migrate through the area are considered light tolerant and will actively forage around white lights (Spoelstra *et al.*, 2017; BCT, 2018), which would increase the risk of collision with the turbines. However, studies in the US have found no impacts on bat mortality associated with aviation lighting (Guest *et al.*, 2022), with Cryan and Barclay (2009) finding no difference in mortality at lit WTGs compared to unlit WTGs. Given this unknown, all potential OWFs identified in **Table 13-2** have been included in this CEA.
599. The level of bat activity potentially associated with offshore movements, recorded for both Dublin Array OWF and CWP Project baselines, as well as the other Tier 1 OWF projects was considered low. The impacts from offshore would be indistinguishable from the current baseline, with a high level of artificial lighting already present due to existing vessel movements and all species adapting to this slight change in offshore lighting, if impacted at all. This would result in a **not significant** cumulative impact for the Tier 1 projects.
600. There are no Tier 2 or Tier 3 projects of relevance, or for which there is adequate information to undertake a meaningful assessment. As such, there are anticipated to be no significant cumulative effects with CWP cumulatively with Tier 3 projects; the same conclusion being drawn for Tier 1, Tier 2 and Tier 3 combined.

11.6 CEA summary

601. This CEA, which supports EIAR **Volume 3, Chapter 13** has assessed the potential cumulative effects on offshore bats from the construction and operation and maintenance phases of the CWP Project alongside other development.
602. **Table 13-3** below has been adopted from the PINS advice on CEA for NSIPs (PINS, 2024) as a means of summarising the potential adverse or beneficial cumulative effects of the CWP Project with other development. It summarises the outcomes of the detailed assessment provided above and sets out the proposed mitigation measures needed to address cumulative effects, if deemed necessary.
603. Overall, the CEA for offshore bats highlights the potential for slight cumulative impact associated with collision resulting from the CWP Project alongside other projects. This slight significant impact was also identified within **Chapter 13** and will be monitored through the CWP proposals. It is assumed other projects will similarly monitor for impacts on offshore bats. Through monitoring of bat activity around the WTG, if collisions are recorded, mitigation will be discussed to reduce this impact to a not significant cumulative impact.



604. The remaining potential impacts will not result in significant cumulative effects.

Table 11-3 Summary of other development screened into the CEA for offshore bats

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
Construction phase				
Cumulative Impact 1: Disturbance				
CA_33 OWF_01 CA_30 OWF_04 OWF_06	1 – no other Tiers of relevance	Negligible (not significant in EIA terms)	No additional mitigation required	Negligible (not significant in EIA terms)
Cumulative Impact 2: Lighting				
CA_33 OWF_01 CA_30 OWF_04 OWF_06	1 – no other Tiers of relevance	Negligible (not significant in EIA terms)	No additional mitigation required	Negligible (not significant in EIA terms)
Operation and maintenance phase				
Cumulative Impact 1: Disturbance				
OWF_01 CA_30 OWF_04 OWF_06	1 – no other Tiers of relevance	Negligible (not significant in EIA terms)	No additional mitigation required	Negligible (not significant in EIA terms)

Cumulative Impact 2: Collision

OWF_01 CA_30 OWF_04 OWF_06	1 – no other Tiers of relevance	Slightly significant	Monitoring and adaptive management if required	Negligible (not significant in EIA terms)

Cumulative Impact 3: Lighting

OWF_01 CA_30 OWF_04 OWF_06	1 – no other Tiers of relevance	Negligible (not significant in EIA terms)	No additional mitigation required	Negligible (not significant in EIA terms)

11.7 References

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12 MARINE ARCHAEOLOGY & CULTURAL HERITAGE

12.1 Introduction

621. This section of the **CEA Report** presents the findings of the CEA for marine archaeology and cultural heritage, which considers the residual effects presented in **Volume 3, Chapter 14 Marine Archaeology and Cultural Heritage** alongside the potential effects of other proposed and reasonably foreseeable development. Cumulative effects are considered in this document across the construction and operation and maintenance phases of the CWP Project.
622. The detail and scope of the decommissioning works for the CWP Project will be determined by the relevant legislation and guidance at the time of decommissioning. Project alone impacts during the decommissioning phase of the CWP Project are assessed in EIAR **Volume 3, Chapter 14 Marine Archaeology and Cultural Heritage**. It is anticipated that the impacts will be no greater than those identified for the construction phase, and therefore no separate assessment of cumulative impacts during the decommissioning phase is presented within this CEA.
623. Updates to the project alone assessment for marine archaeology and cultural heritage as a consequence of ACPs FIR are presented in **Section 14** of the **EIAR Addendum**. This updated CEA incorporates relevant updates from the project alone assessment and has been updated in response to the requests made in item 5 of the FIR.

12.2 Consultation

624. Stakeholder and regulator feedback received during the consultation process that is relevant to the marine archaeology and cultural heritage is provided in EIAR **Volume 3, Chapter 14 Marine Archaeology and Cultural Heritage**.
625. No stakeholder or regulator feedback was received during the consultation process that is relevant to the CEA for marine archaeology and cultural heritage.

12.3 CEA impact screening

626. The first step in the CEA for marine archaeology and cultural heritage is the identification of which residual impacts assessed for the CWP Project alone have the potential for a cumulative impact with other development (described as 'impact screening'). This screening exercise is set out in **Table 12-1** below.
627. Only potential impacts assessed in **Volume 3, Chapter 14 Marine Archaeology and Cultural Heritage**, and **Section 14** of the **EIAR Addendum** as 'moderately significant' or above are included in the CEA (i.e. those assessed as 'imperceptible' are not taken forward as there is no potential for them to contribute to a cumulative effect).

Table 12-1 Impacts and potential for cumulative effect

Impact	CWP Project alone residual effect	Potential for significant cumulative effect – screened into the CEA (Yes / No)
Construction		
Direct disturbance to seabed causing damage to receptors	Not significant	No
Indirect disturbance to receptors caused by changes to the hydrodynamic and SSC due to spoil removal and suspended sediment redistribution	Not significant	No
Operation		
Direct disturbance to previously not impacted seabed causing damage to receptors	Not significant	No
Indirect disturbance to receptors caused by changes SSC and scour associated with installation structures	Not significant	No
Decommissioning		
Potential effect of decommissioning would be the same as Construction phase if CWP Project was to be removed. This would include: • Direct disturbance to seabed causing damage to receptors; and • Indirect disturbance to receptors caused by changes to SSC and scour associated with decommissioning activities.	The detail and scope of the decommissioning works for the CWP Project will be determined by the relevant legislation and guidance at the time of decommissioning. Project alone impacts during the decommissioning phase of the CWP Project are assessed in Chapter 14 Marine Archaeology and Cultural Heritage. It is anticipated that the impacts will be no greater than those identified for the construction phase, and therefore no separate assessment of cumulative impacts during the decommissioning phase is presented within this CEA.	

12.4 Stage 3: Information gathering and ‘other development’ screening

628. Stage 2 of the CEA is presented in **Appendix 1** of **Part 1** of the **CEA Report**. This exercise established a shortlist of other development for marine archaeology and cultural heritage using set screening criteria.

629. The shortlist of other development screened into the CEA for marine archaeology and cultural heritage at Stage 2 are listed below.
- Dublin Port Company - Maintenance Dredging in Dublin Port (CA_40 / DAS_04)
 - Dublin Port Company – Dublin Port Capital Dredging Project (DAS_19)
 - Dublin Port Company - Dredge disposal (DAS_03)
 - Dublin Port Company - 3FM Project (CA_33)
 - Dublin Port Company - MP2 Project (CA_16)
 - RWE - Dublin Array OWF (OWF_02)
 - Dun Laoghaire Rathdown County Council - Mooring Maintenance (CA_19)
 - SSS Renewables - Arklow Bank Wind Park 2 (OWF_01).
630. Information gathering (Stage 3 of the CEA) has enabled a further review of the other development shortlist for marine archaeology and cultural heritage, including a more detailed consideration of the location, nature and scale of the development, the timing of construction and operation activities, the information available to inform a CEA and the likelihood of a significant effect.
631. This information has been used to screen the Stage 2 shortlist to establish a final list of other development for detailed assessment at Stage 4 of the CEA. The results of the exercise are presented in **Table 12-2** below.

Table 12-2 Summary of other development screened into the CEA for marine archaeology and cultural heritage

Development	Distance from the array site (km)	Distance from the export cable corridor	Tier	Included in the CEA (Yes/No)	Rationale
Dublin Port Company Maintenance Dredging in Dublin Port CA_40 / DAS_04 Planning Ref: FS007132 and S0004-03	32.2 / 23.2	0.8 / 3.7	1	No	Direct Impacts As there will be no spatial interaction between the two developments there will be no direct disturbance or damage to marine archaeology. As a result, no cumulative effects are anticipated. Indirect Impacts Changes in local sediment patterns may lead to increased exposure or burial of marine archaeology receptors but this potential impact has been assessed to be negligible, which is not significant. Therefore, no adverse cumulative effect would occur as a result of additive effects from CWP Project and maintenance dredging in Dublin Port.
Dublin Port Company Dublin Port Capital Dredging Project DAS_19 Planning Ref:	23.2	3.7	1	No	Direct Impacts As there will be no spatial interaction between the two developments there will be no direct disturbance or damage to marine archaeology. As a result, no cumulative effects are anticipated. Indirect Impacts Changes in local sediment patterns may lead to increased exposure or burial of marine archaeology receptors but this potential impact has been assessed to be negligible, which is not significant. Therefore, no adverse cumulative effect would occur as a result of additive effects from CWP Project and capital dredging project.

Development	Distance from the array site (km)	Distance from the export cable corridor	Tier	Included in the CEA (Yes/No)	Rationale
FS007164 and S0033-01					
Dublin Port Company Dredge disposal DAS_03 Planning Ref: S0024-02	23.2	3.7	1	No	Direct Impacts As there will be no spatial interaction between the two developments there will be no direct disturbance or damage to marine archaeology. As a result, no cumulative effects are anticipated. Indirect Impacts Changes in local sediment patterns may lead to increased exposure or burial of marine archaeology receptors but this potential impact has been assessed to be negligible, which is not significant. Therefore, no adverse cumulative effect would occur as a result of additive effects from CWP Project and dredge disposal.
Dublin Port Company 3FM Project CA_33 Planning Ref: PA29N.320250	31.3	0.6	1	No	Direct Impacts As there will be no spatial interaction between the two developments there will be no direct disturbance or damage to marine archaeology. As a result, no cumulative effects are anticipated. Indirect Impacts Changes in local sediment patterns may lead to increased exposure or burial of marine archaeology receptors but this potential impact has been assessed to be negligible, which is not significant. Therefore, no adverse cumulative effect would occur as a result of additive effects from CWP Project and 3FM Project.
Dublin Port Company	25.1	4.2	1	No	Direct Impacts

Development	Distance from the array site (km)	Distance from the export cable corridor	Tier	Included in the CEA (Yes/No)	Rationale
MP2 Project CA_16 Planning Ref: PA29N.304888					As there will be no spatial interaction between the two developments there will be no direct disturbance or damage to marine archaeology. As a result, no cumulative effects are anticipated. Indirect Impacts Changes in local sediment patterns may lead to increased exposure or burial of marine archaeology receptors but this potential impact has been assessed to be negligible, which is not significant. Therefore, no adverse cumulative effect would occur as a result of additive effects from CWP Project and MP2 Project.
RWE Dublin Array OWF_02 Planning Ref: OA06D.321992	2.8	0.0 (OECC crossings with Dublin Array offshore export cables)	1	No	Direct Impacts Direct cumulative effects on marine archaeology receptors have the potential to occur where the OECC of CWP Project and the export cable of Dublin Array overlap. As part of CWP Project, archaeological mitigation measures will avoid impact on known and unknown sites. Similarly, as part of the foreshore licence conditions for Dublin Array (Schedule 31.24–31.26), archaeological mitigation measures, including archaeological monitoring and implementation of a protocol, are required to ensure archaeological risk is managed. As a result, no cumulative effects are anticipated. Indirect Impacts Changes in local sediment patterns may lead to increased exposure or burial of marine archaeology receptors but this potential impact has been assessed to be negligible, which is not significant. Therefore, no

Development	Distance from the array site (km)	Distance from the export cable corridor	Tier	Included in the CEA (Yes/No)	Rationale
					adverse cumulative effect would occur as a result of additive effects from CWP Project and Dublin Array.
Dun Laoghaire Rathdown County Council Mooring Maintenance CA_19 Planning Ref: FS006713	25.6	0.4	1	No	Direct Impacts As there will be no spatial interaction between the two developments there will be no direct disturbance or damage to marine archaeology. As a result, no cumulative effects are anticipated.
SSE Renewables Arklow Bank Wind Project Park 2 OWF_01 Planning Ref: OA27.319864	9.3	17.6	1	No	Direct Impacts As there will be no spatial interaction between the two developments there will be no direct disturbance or damage to marine archaeology. As a result, no cumulative effects are anticipated. Furthermore, an EIAR chapter covering marine archaeology and cultural heritage was submitted as part of the planning application for Arklow Bank Wind Project Park 2. This impact assessment factored in archaeological mitigation measures, including implementation of AEZs, an archaeology management plan to facilitate the recording and reporting of any archaeological material discovered, and archaeological monitoring as required, to ensure archaeological risk is managed. Indirect Impacts

Development	Distance from the array site (km)	Distance from the export cable corridor	Tier	Included in the CEA (Yes/No)	Rationale
					Changes in local sediment patterns may lead to increased exposure or burial of marine archaeology receptors but this potential impact has been assessed to be negligible, which is not significant. Therefore, no adverse cumulative effect would occur as a result of additive effects from CWP Project and Arklow Bank Wind Project Park 2.

12.5 Stage 4: Assessment of cumulative effects

632. As a result of the other development screening presented in the above **Table 12-2**, the CEA for marine archaeology and cultural heritage does not identify any potential for significant cumulative effects resulting from the CWP Project alongside other development. Therefore, no other developments screened in Stage 2 and detailed in Stage 3 have been taken forward for Stage 4 assessment.

12.6 CEA summary

633. This CEA, which supports EIAR **Volume 3, Chapter 14 Marine Archaeology and Cultural Heritage** has assessed the potential cumulative effects on marine archaeology and cultural heritage from the construction and operation and maintenance phases of the CWP Project alongside other development.
634. **Table 12-3** below has been adopted from the PINS advice on CEA for NSIPs (PINS, 2024) as a means of summarising the potential adverse or beneficial cumulative effects of the CWP Project with other development. It summarises the outcomes of the detailed assessment provided above and sets out the proposed mitigation measures needed to address cumulative effects, if deemed necessary.
635. In summary, the CEA for marine archaeology and cultural heritage does not identify any significant cumulative effects resulting from the CWP Project alongside other development.

Table 12-3 Summary of cumulative effects assessment

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
Construction phase				
Cumulative Impact 1: Direct disturbance to seabed causing damage to receptors				
OWF_02	1	Slight adverse (not significant in EIA terms)	No additional mitigation required	N/A (not significant in EIA terms)
Cumulative Impact 2: Indirect disturbance to receptors caused by changes to the hydrodynamic and SSC due to spoil removal and suspended sediment redistribution				
DAS_19, DAS_03, CA_33, CA_16, OWF_01	1	N/A (not significant in EIA terms)	No additional mitigation required	N/A (not significant in EIA terms)
Operation and maintenance phase				
Cumulative Impact 1: Direct disturbance to previously not impacted seabed causing damage to receptors				
None	N/A	N/A	N/A	N/A

Cumulative Impact 1: Indirect disturbance to receptors caused by changes SSC and scour associated with installation structures

DAS_03, CA_33, CA_16, OWF_01	1	N/A (not significant in EIA terms)	N/A (not significant in EIA terms)	N/A (not significant in EIA terms)

13 SEASCAPE, LANDSCAPE AND VISUAL IMPACTS

13.1 Introduction

636. This section of the **CEA Report** presents the findings of the CEA for Seascape, Landscape and Visual Impact Assessment (SLVIA), which considers the residual effects presented in **Volume 3, Chapter 15** SLVIA alongside the potential effects of other proposed and reasonably foreseeable development. Cumulative effects are considered in this document across the construction, operation and maintenance phases of the CWP Project.
637. The detail and scope of the decommissioning works for the CWP Project will be determined by the relevant legislation and guidance at the time of decommissioning. Project alone impacts during the decommissioning phase of the CWP Project are assessed in EIAR **Volume 3, Chapter 15 SLVIA**. It is anticipated that the impacts will be no greater than those identified for the construction phase, and therefore no separate assessment of cumulative impacts during the decommissioning phase is presented within this CEA.
638. Updates to the project alone assessment for SLVIA as a consequence of ACPs FIR are presented in Section 15 of the **EIAR Addendum**. This updated CEA incorporates relevant updates from the project alone assessment and has been updated in response to the requests made in item 5 of the FIR.
639. This section of the CEA should be read in conjunction with the following Appendices and Figures in EIAR **Volume 4**, which supported EIAR **Volume 3, Chapter 15 SLVIA**:
- **Appendix 15.2 Representative Scenario and LoD Assessment**
 - **Appendix 15.3 SLVIA Methodology**
 - **Appendix 15.10 SLVIA Figures:**
 - **Figure 15.15** Cumulative sites;
 - **Figure 15.16a** Tip Height Zone of Theoretical Visibility (ZTV) Option A with cumulative sites (north);
 - **Figure 15.16b** Tip Height Zone of Theoretical Visibility (ZTV) Option A with cumulative sites (north);
 - **Figure 15.16c** Tip Height Zone of Theoretical Visibility (ZTV) Option B with cumulative sites (north);
 - **Figure 15.16d** Tip Height Zone of Theoretical Visibility (ZTV) Option B with cumulative sites (south);
 - **Figure 15.16e** Hub Height ZTV Option A with cumulative sites (north);
 - **Figure 15.16f** Hub Height ZTV Option A with cumulative sites (south);
 - **Figure 15.16g** Hub Height ZTV Option B with cumulative sites (north);
 - **Figure 15.16h** Hub Height ZTV Option B with cumulative sites (north);
 - **Figure 15.16i** Blade Tip Height (ZTV) Option A with operational cumulative sites;
 - **Figure 15.16j** Blade Tip Height (ZTV) Option B with operational cumulative site;
 - **Figure 15.16k** Hub Height (ZTV) Option A with operational cumulative sites; and
 - **Figure 15.16l** Hub Height (ZTV) Option B with operational cumulative sites.

- **Appendix 15.11 Visualisations³:**
 - **Figure 15.17.1:** Viewpoint 1 Howth Summit;
 - **Figure 15.17.2** North Bull Island;
 - **Figure 15.17.3** Viewpoint 3 Great South Wall, Poolbeg;
 - **Figure 15.17.4** Viewpoint 4 Dun Laoghaire, East Pier;
 - **Figure 15.17.5** Viewpoint 5 Killiney Hill Obelisk;
 - **Figure 15.17.6** Viewpoint 6 Carrickgollogan Hill;
 - **Figure 15.17.7** Viewpoint 7 Bray Promenade;
 - **Figure 15.17.8:** Viewpoint 8 Bray Head;
 - **Figure 15.17.9:** Viewpoint 9 Great Sugar Loaf;
 - **Figure 15.17.10:** Viewpoint 10 Greystones;
 - **Figure 15.17.11:** Viewpoint 11 Kilcoole;
 - **Figure 15.17.12:** Viewpoint 12 Six Mile Point;
 - **Figure 15.17.13:** Viewpoint 13 Wicklow Town Harbour;
 - **Figure 15.17.14:** Viewpoint 14 Djouce Mountain;
 - **Figure 15.17.15:** Viewpoint 15 Brockagh Mountain;
 - **Figure 15.17.18:** Viewpoint 18 Brittas Bay;
 - **Figure 15.17.19:** Viewpoint 19 Arklow Pier (South Side);
 - **Figure 15.17.20:** Viewpoint 20 Kilmichael Point;
 - **Figure 15.17.21:** Viewpoint 21 Shankill Beach;
 - **Figure 15.17.22:** Viewpoint 22 Three Rock Mountain;
 - **Figure 15.17.23:** Viewpoint 23 Magheramore Beach;
 - **Figure 15.17.24:** Viewpoint 24 Kilcoole Rock; and
 - **Figure 15.17.26:** Viewpoint 26 Greystones Beach Bear.

640. No updates have been made to **Appendix 15.2 Representative Scenario and LoD Assessment, Appendix 15.3 SLVIA Methodology, Appendix 15.10 SLVIA Figures and Appendix 15.11 Visualisations** following the FIR.
641. This updated CEA for SLVIA examined the same groups of seascape, landscape, townscape, nationally designated landscapes and visual receptors as the project alone assessment although different viewpoints were used in order to better represent the likely range of effects arising from the combination of schemes. The updated CEA for SLVIA was informed by cumulative ZTVs in Appendix 15.10 showing the extent of visual effects of the schemes in different colours to illustrate where visibility of more than one development was likely to arise. Cumulative wireframes and photomontages presented in Appendix 15.11 Visualisations have also informed the updated CEA for SLVIA.
642. In addition, the effects on users of routes through the area, from which developments may be sequentially visible as one passes through the landscape, were also considered, if appropriate. This updated CEA for SLVIA was based on the desk study of ZTVs and aerial photography, and site visits to travel along the routes being assessed.
643. Additive cumulative effects are assessed based on the scenario where the seascape, landscape / townscape, national protected landscapes and visual effects of the CWP Project's offshore infrastructure are added to the marine environment, which already includes other Phase 1 Projects as well as the existing presence of Arklow Bank OWF Phase 1. The additive approach is compliant with GLVIA3, SNH Guidance and IEMA Guidance on approaches to cumulative assessment and was

³ Each viewpoint included a visualisation pack with contextual, baseline, wireframes and photomontages including cumulative wireframes. These were presented for both Option A and B (daytime) and referred to with the suffix A to G. Specific nighttime images were prepared for Viewpoints 7,10, 11 and 13 covered by the suffix H to N. Cumulative photomontages were prepared for Option B. Daytime cumulative photomontages referred to with the suffix G were prepared for Viewpoint 1 and 26 and night-time cumulative photomontages referred to with the suffix M and N were prepared for Viewpoints 10 and 11.

agreed amongst all Phase 1 Projects as the most appropriate way in which to undertake the cumulative assessment, discussed further in **Table 13-1**.

644. For each assessed receptor, incremental effects might be the same as for the CWP Project in isolation or reduced (where the influence of other schemes in planning would be such that were they consented and considered to be part of the baseline, the incremental change arising from the addition of the CWP Project would be less). Subject to the distance and degree of intervening landform, vegetation and structures there may be no cumulative effects.

13.2 Consultation

645. **Table 13-1** provides a summary of stakeholder and regulator feedback received during the consultation process that is relevant to the CEA for SLVIA.

Table 13-1 Consultation responses relevant to the CEA for SLVIA

Consultee	Comment	How issues have been addressed
Scoping responses		
No stakeholder or regulatory feedback was received during the consultation process that is relevant to the CEA for the SLVIA		
Topic specific meetings		
Dublin Array (Meeting – 27/07/2023)	Discussion on SLVIA methodology, viewpoints, stakeholder consultation, cumulative assessment and nighttime assessment for the CWP Project and Dublin Array projects.	Both projects proposed a 50 km study area for the site boundary, which is 50 km from the outermost WTG for SLVIA. Eleven viewpoints from the CWP Project were in similar locations to Dublin Array. It was agreed that both projects would share design information when available to mitigate cumulative impacts. Four night-time viewpoints were selected from key locations based on likely significant effects.

Consultee	Comment	How issues have been addressed
SLVIA leads on the following Phase 1 Projects: • Oriel OWF (CEA-0096); • RWE Renewables – Dublin Array OWF (CEA-0037); • Statkraft Ireland - North Irish Sea Array (NISA) OWF (CEA-0094); and • Sure Partners Limited / SSE Renewables - Arklow Bank OWF Phase 2 (CEA-0004). (Two virtual meetings on 1.11.2023 and 27.11 2023)	Discussions were had over measures to achieve a consistent approach to the CEA methodology to aid review and determination. Areas discussed included: • Consistent study area • Development options assessed • Cumulative wireframe visualisations • Night-time cumulative photomontages • Daytime cumulative photomontages	• It was agreed that: • A study area of 50 km would be applied to all Cumulative SLVIAs (CSLVA) based on a buffer to the project boundary of each individual project and would consider relevant onshore and offshore developments. • A single consistently applied option would be assessed in the Cumulative Seascape Landscape and Visual Impact Assessment (CSLVIA) based on the tallest and fewest wind turbines for each of the proposed developments. A supporting narrative would be provided for all developments explaining where variations in impact may be experienced, for example, where other options are being submitted and where the limits of deviation or spatial flexibility may influence impact judgements. • Cumulative wireframes would be prepared for all developments to illustrate the assessed scheme referred to above. Cumulative wireframes would be prepared for all viewpoints assessed in the project SLVIAs. • CSLVIAs would assess both Irish Aviation Authority (IAA) lighting requirements (white flashing light) at 2,000 candela and European Union / United Kingdom Guidance (red static light) (2,000 candela) to illustrate in a small number of cumulative nighttime photomontages. • Daytime cumulative photomontages would be prepared for a select number of viewpoints for each CSLVIA.

Consultee	Comment	How issues have been addressed
Other		
Community and recreational coastline users: Various forms of consultation with the community were undertaken by CWP Limited. The approach is presented in the Public and Stakeholder Consultation Report and supporting appendices, including Phase 1 and Phase 2 Feedback and Response Reports.	Key concerns raised during the consultation process related to visual impact, including cumulative visual impact with Dublin Array and potential light pollution of the turbines if they were lit up at night and how visible they would be from shore. Mention was made of compensation for the perceived negative visual impact and that sea views a short distance from a major European capital city should be protected.	The visual impact of the CWP Project has been assessed as part of the SLVIA alongside the cumulative visual impact with other potential Phase 1 Projects. The SLVIA considered the impact of lighting associated with the CWP Project's offshore infrastructure on visual receptors, and night-time photomontages prepared from key locations, including Viewpoints 7, 10, 11 and 13, refer to: • Figure 15.17.7: Bray Promenade • Figure 15.17.10: Greystones • Figure 15.17.11: Kilcoole • Figure 15.17.13: Wicklow Town Harbour Refer to Appendix 15.11 Visualisations.

13.3 CEA impact screening

646. The first step in the CEA for SLVIA is the identification of which residual impacts assessed for the CWP Project alone have the potential for a cumulative impact with other development (described as 'impact screening'). This screening exercise is set out in **Table 13-2** below.
647. Only potential impacts assessed in **Volume 3, Chapter 15 SLVIA** as ['Slight'] or above were included in the updated CEA of SLVIA (i.e., those assessed as Imperceptible or Not Significant were not taken forward as there was no potential for them to contribute to a cumulative effect). SLVIA receptors considered to receive effects assessed as Imperceptible or Not Significant (both localised and overall) from the CWP Project were not included in this updated CEA for SLVIA, as an effect of such low significance manifestly adds nothing or very little regardless of the effects of other developments. If significant cumulative effects arise on those receptors, they would be because of other developments and as such were not relevant for consideration as part of this CEA for SLVIA.

Table 13-2 Impacts and potential for cumulative effect

Impact	CWP Project alone residual effect	Potential for significant cumulative effect – screened into the CEA (Yes / No)
Construction		
Impact 1: Direct / indirect temporary impacts on seascape / landscape / townscape, national designated landscapes and visual receptors.	<u>Seascape</u> - from Not Significant adverse (not Significant) to Moderate adverse (not significant) <u>Landscape / townscape</u> - from Imperceptible adverse (not significant) to Moderate adverse (not significant) <u>National Designated Landscapes</u> - from Slight adverse (not significant) to Moderate adverse (not significant) <u>Viewpoints</u> - from Not Significant adverse (not significant) to Moderate adverse (not significant) <u>Settlements</u> - from Not Significant adverse (not significant) to Moderate adverse (not significant) <u>Sequential Routes</u> - from Imperceptible adverse (not significant) to Moderate adverse (not significant) <u>Visual Receptor Groups</u> - from Slight–Not Significant adverse (not significant) to Moderate adverse (not significant)	Yes
Impact 2: Direct / indirect temporary nighttime impacts on seascape / landscape and townscape /	<u>Seascape</u> – from Not Significant adverse (not significant) to Slight adverse (not significant)	Yes

Impact	CWP Project alone residual effect	Potential for significant cumulative effect – screened into the CEA (Yes / No)
national designated landscapes and visual receptors.	<u>Landscape / townscape</u> - from Imperceptible adverse (not significant) to Moderate adverse (not significant). <u>National Designated Landscapes</u> – from Slight adverse (not significant) to Moderate adverse (not significant) <u>Viewpoints</u> – from Not Significant adverse (not significant) to Moderate adverse (not significant) <u>Settlements</u> – from Not Significant adverse (not significant) to Moderate adverse (not significant) <u>Sequential Routes</u> – from Imperceptible adverse (not significant) to Moderate-Slight adverse (not significant) <u>Visual Receptor Groups</u> – from Not Significant adverse (not significant) to Moderate adverse (not significant)	
Operation/Maintenance		
Impact 3: Direct / indirect long term though reversible impacts on seascape / landscape and townscapes / national designated landscapes and visual receptors.	<u>Seascape</u> – from Slight adverse (not significant) to Significant adverse (significant) <u>Landscape / townscape</u> - from Imperceptible adverse (not significant) to Significant adverse (significant)	Yes

Impact	CWP Project alone residual effect	Potential for significant cumulative effect – screened into the CEA (Yes / No)
	<u>National Designated Landscapes</u> – from Moderate-Slight adverse (not significant) to Significant adverse (significant) <u>Viewpoints</u> – from Slight adverse (not significant) to Very Significant adverse (significant). <u>Settlements</u> – from Slight adverse (not significant) to Very Significant adverse (significant) <u>Sequential Routes</u> – from – from Slight adverse (not significant) to Very Significant adverse (significant) <u>Visual Receptor Groups</u> – from Moderate adverse (not significant) to Very Significant adverse (significant)	
Impact 4: Direct / indirect long term though reversible nighttime impacts on / seascape / landscape and townscape / national designated landscapes and visual receptors.	<u>Seascape</u> – from Not Significant adverse (not significant) to Slight adverse (not significant) <u>Landscape / townscape</u> – from Imperceptible adverse (not significant) to Moderate-Slight adverse (not significant) <u>National Designated Landscapes</u> – from Slight adverse (not significant) to Moderate adverse (not significant)	Yes

Impact	CWP Project alone residual effect	Potential for significant cumulative effect – screened into the CEA (Yes / No)
	<u>Viewpoints</u> – from Not Significant adverse (not significant) to Moderate adverse (not significant) <u>Settlements</u> – from Not Significant adverse (not significant) to Moderate-Slight adverse (not significant) <u>Sequential Routes</u> – from Not Significant adverse (not significant) to Moderate-Slight adverse (not significant) <u>Visual Receptor Groups</u> – from Not Significant adverse (not significant) to Moderate-Slight adverse (not significant)	
Decommissioning		
Impact 5: Direct / indirect temporary impacts on / seascape / landscape and townscape / national designated landscapes and visual receptors	The detail and scope of the decommissioning works for the CWP Project will be determined by the relevant legislation and guidance at the time of decommissioning. Project alone impacts during the decommissioning phase of the CWP Project are assessed in EIAR Volume 3, Chapter 15 SLVIA. It is anticipated that the impacts will be no greater than those identified for the construction phase, and therefore no separate assessment of cumulative impacts during the decommissioning phase is presented within this CEA.	
Impact 6: Direct / indirect temporary nighttime impacts on seascape / landscape and townscape / national designated landscapes and visual receptors		

13.4 Stage 3: Information gathering and ‘other development’ screening

648. Stage 2 of the CEA is presented in **Appendix 1** of **Part 1** of the **CEA Report**. This exercise established a shortlist of other development for SLVIA using set screening criteria.
649. The shortlist of other development screened into the updated CEA for SLVIA at Stage 2 are listed below.
- RWE - Dublin Array (CEA-0037)
 - SSE Renewables - Arklow Bank Wind Park 2 (CEA-0004)
 - GE Energy - Arklow Bank Wind Park 1 (CEA-0003)
 - Statkraft - North Irish Sea Array (CEA-0094)
650. Information gathering (Stage 3 of the CEA) has enabled a further review of the other development shortlist for the CEA for SLVIA, including a more detailed consideration of the location, nature and scale of the development, the timing of construction and operation activities, the information available to inform a CEA and the likelihood of a significant effect.
651. This information has been used to screen the Stage 2 shortlist to establish a final list of other developments for detailed assessment at Stage 4 of the updated CEA for SLVIA. The results of the exercise are presented in **Table 13-3** below.

Table 13-3 Summary of other development screened into the CEA for SLVIA

Development	Distance from the array site (km)	Distance from the export cable corridor	Tier	Included in the CEA (Yes/No)	Rationale
Dublin Array OWF (CEA-0037)	2.8	0	1	Yes	This development is one of the Phase 1 Projects and involves the construction of between 39-50 no WTGs based on Option A to C. Potential cumulative effects arising from the addition of the CWP Project in a cumulative context which features this development are considered in relation to seascape, landscape and townscape, national designated landscapes and visual effects.
Arklow Bank Wind Park 2 OWF (CEA-0004)	9.3	17.6	1	Yes	This development is one of the Phase 1 Projects and involves the construction of between 47 to 56 no WTGs based on Option 1 and 2 .

Development	Distance from the array site (km)	Distance from the export cable corridor	Tier	Included in the CEA (Yes/No)	Rationale
					Potential cumulative effects arising from the addition of the CWP Project in a cumulative context which features this development are considered in relation to seascape, landscape and townscape, national designated landscapes and visual effects.
Arklow Bank Wind Park 1 OWF (CEA-0003)	22.1	28.3	1	Yes	The operational Arklow Bank OWF Phase 1 is considered as part of the existing baseline and referenced in EIAR Volume 3, Chapter 15 SLVIA and the accompanying appendices as relevant. Further consideration within the updated CEA is not considered necessary.

Development	Distance from the array site (km)	Distance from the export cable corridor	Tier	Included in the CEA (Yes/No)	Rationale
North Irish Sea Array OWF (NISA) (CEA-0094)	51.0	35.7	1	Yes	This development is one of the Phase 1 Projects and involves the construction of between 35 to 49 no WTGs based on Option 1 and 2. Potential cumulative effects arising from the addition of the CWP Project in a cumulative context which features this development are considered in relation to seascape, landscape and townscape, national designated landscapes and visual effects.
Oriel OWF (CEA 0096)	83.9	61.6	1	No	The proposed Oriel OWF is located beyond the 50 km study area for the SLVIA. However, given its status as one of the Phase 1 Projects, initial consideration has

Development	Distance from the array site (km)	Distance from the export cable corridor	Tier	Included in the CEA (Yes/No)	Rationale
					been given to the potential for cumulative seascape, landscape and townscape, national designated landscapes or visual effects, including inclusion within the suite of cumulative ZTVs (EIAR Volume 4, Appendix 15.10 Figure 15.16) and visualisations (EIAR Volume 4, Appendix 15.11 Visualisation). These demonstrate that the proposed Oriel OWF would only be visible from a very small proportion of the study area, limited predominantly to areas of higher ground where views would be very distant. Further consideration within the updated CEA was not considered necessary.

13.5 Stage 4: Assessment of cumulative effects

652. The assessment of effects associated with CWP Project 'alone' has concluded that no difference in magnitude occurs in the assessment of Option A and Option B, and neither option introduces any new effects or receptors. As such, a representative scenario approach has been adopted for the purposes of the updated CEA for SLVIA wherein Option B is considered cumulatively with other relevant plans and projects. For SLVIA, the effects of Option A would be as reported for Option B.
653. The updated CEA for SLVIA assessed the worst-case scenario for each of the Phase 1 Projects. The worst-case scenario for each CSLVIA Phase 1 Project taken forward for the updated CEA is described below:
- Dublin Array OWF (CEA-00037): Option C: 39 no WTGs at a blade tip height of 309.
 - Arklow Bank OWF Phase 2 (CEA-0004): Option 2 47 no WTGs at a blade tip height of 287m.
 - NISA OWF (CEA-0094): Option 2 35 no WTGs at a blade tip height of 316m

For NISA, the CSLVIA assessed both options for the visual assessment.

654. It is noted that whilst the range of turbines presented in two of the Phase 1 Projects in **Table 13-3**⁴ may have changed since the submitted EIAR, the worst-case scenarios remain the same. As discussed above the updated CEA for SLVIA was supported by cumulative ZTVs and visualisations in the EIAR, **Volume 4, Appendix 15.10 SLVIA figures** and **Appendix 15.11 Visualisations** respectively.

13.5.1 Construction phase

Cumulative Impact 1: Direct / indirect temporary impacts on seascape / landscape / townscape, national designated landscapes and visual receptors

Seascape receptors

655. The following Regional Seascape Receptors have been assessed in **Chapter 15 SLVIA** as having potential effects of **Slight** significance or above during construction:
- Regional Seascape Character Area (RSCA) 13 South Irish Sea; and
 - RSCA 14 Irish Sea, Sandbank and Broad Bays.
656. **RSCA 13 South Irish Sea** has been assessed to be of **Medium** sensitivity. During construction, the magnitude of change has been assessed as **Medium** and the resultant effects of the CWP Project 'alone' has been assessed to be **Moderate** (not significant). The operational Arklow Bank OWF Phase I is located within this RSCA. Arklow Bank OWF Phase 2 would be located within this RSCA, with Dublin Array OWF located approximately 22.5 km north of the RSCA and NISA OWF approximately 70.2 km north. During construction, given a cumulative baseline where the effects of the construction of the CWP Project's offshore infrastructure are added to the construction of Arklow Bank OWF Phase 2, Dublin Array OWF and NISA OWF with the existing presence of Arklow Bank OWF Phase I, the construction of the CWP Project's offshore infrastructure would have a reduced

⁴ Dublin Array OWF's range of options has altered from 45-61 no WTGs in the CWP Project's submitted EIAR to 39 to 50 no WTGs in their submitted CSLVIA, whilst NISA OWF's range of options has altered from 30-36 no WTGs in the CWP Project's submitted EIAR to 35-49 WTGs in their submitted CSLVIA.

effect on this RSCA. The main effects on the RSCA would result from the construction of Arklow Bank OWF Phase 2 during the first year of the construction of CWP Project's offshore infrastructure and operational phase thereafter. Works would be temporary in nature and short term in duration. The resultant magnitude of change would be **Low** (medium in scale, short-term and localised in terms of geographical extent). The significance of effect would be **Slight** (not significant).

657. **RSCA 14 Irish Sea, Sandbank and Broad Bays** has been assessed to be of **Medium** sensitivity. During construction, the magnitude of change has been assessed as **Medium** and the resultant effects of the CWP Project 'alone' have been assessed to be **Moderate** (not significant). Dublin Array OWF would be partly located within this RSCA, with NISA OWF approximately 41.4 km north of the RSCA and Arklow Bank OWF Phase 2 located approximately 4.1 km south. During construction, given a cumulative baseline where the effects of the construction of the CWP Project's offshore infrastructure are added to the construction of Dublin Array OWF, NISA OWF and Arklow Bank OWF Phase 2 the construction of the CWP Project's offshore infrastructure would have a reduced effect on this RSCA as the construction of Dublin Array OWF would also affect the RSCA. Works would be temporary in nature and short term in duration. The resultant magnitude of change would be **Medium-Low** (large-medium in scale, short term and intermediate in terms of geographical extent). The significance of effect would be **Slight** (not significant).

Landscape / townscape character receptors

658. The following Landscape / Townscape Character Categories, Areas, Types or Units have been assessed in **Chapter 15 SLVIA** as having potential effects of **Slight** significance or above during construction:

- Dun Laoghaire–Rathdown County Council Landscape and Townscape Character Areas
 - LCA 10 Rathmichael;
 - LCA 11 Ballyman;
 - LCA 12 Shanganagh;
 - TCA 4 Dalkey;
 - TCA 5 Dalkey Island;
 - TCA 6 Killiney Bay; and
 - TCA 7 Shankill.
- Wicklow County Council Landscape Areas and Townscape Character Areas
 - LA 1c The Bray Mountains Group;
 - LA 1d The North Eastern Valley;
 - LA 2a Northern Coastal Area;
 - LA 2b Southern Coastal Area;
 - LA 3a North East Mountain Lowlands;
 - LA 3b South East Mountain Lowlands;
 - TCA 6a Greystones;
 - TCA 6b Kilcoole;
 - TCA 6c Newcastle; and
 - TCA 6d Wicklow.

Dun Laoghaire–Rathdown County Council Landscape and Townscape Character Areas

659. **LCA 10 Rathmichael LCA** has been assessed to be of **Medium** sensitivity. During construction, the magnitude of change has been assessed as **Medium-Low** and the resultant effects of the CWP Project 'alone' have been assessed to be **Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of NISA OWF and Dublin Array OWF throughout much of LCA 10. During construction, given a cumulative baseline where the effects of the construction of the CWP Project's offshore infrastructure are added to those resulting from the construction of NISA OWF and Dublin

Array OWF, the construction of the CWP Project's offshore infrastructure would have a reduced effect on LCA 10 due to the closer proximity of Dublin Array OWF (which would follow the same construction programme as CWP Project's offshore infrastructure). Works would be temporary in nature and short term in duration. The resultant magnitude of change would be **Negligible** (small in scale, short term and wide / intermediate in terms of geographical extent). The significance of effect would be **Not Significant** (not significant).

660. **LCA 11 Ballyman LCA** has been assessed to be of **Medium** sensitivity. During construction, the magnitude of change has been assessed as **Medium-Low** and the resultant effects of the CWP Project 'alone' have been assessed to be **Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of Dublin Array OWF throughout much of LCA 11, with more intermittent visibility of NISA OWF. During construction, given a cumulative baseline where the effects of the construction of the CWP Project's offshore infrastructure are added to those resulting from the construction of Dublin Array OWF, the construction of the CWP Project's offshore infrastructure would have a reduced effect on LCA 11 due to the closer proximity of Dublin Array OWF which would follow the same construction programme as CWP Project's offshore infrastructure with the operational presence of NISA OWF in the distance. Works would be temporary in nature and short term in duration. The resultant magnitude of change would be **Low** (medium-small in scale, short term and intermediate in terms of geographical extent). The significance of effect would be **Slight** (not significant).
661. **LCA 12 Shanganagh LCA** has been assessed to be of **Medium** sensitivity. During construction, the magnitude of change has been assessed as **Medium-Low** and the resultant effects of the CWP Project 'alone' have been assessed to be **Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of the Dublin Array OWF throughout much of LCA 12, with more intermittent visibility of NISA OWF. During construction, given a cumulative baseline where the effects of the construction of the CWP Project's offshore infrastructure are added to those resulting from the Dublin Array OWF the construction of the CWP Project's offshore infrastructure would have a reduced effect on LCA 12 due to the closer proximity of Dublin Array OWF with the operational presence of NISA OWF in the distance. Works would be temporary in nature and short term in duration. The resultant magnitude of change would be **Low** (medium-small in scale, short term and intermediate in terms of geographical extent). The significance of effect would be **Slight** (not significant).
662. **TCA 4 Dalkey** has been assessed to be of **High-Medium** sensitivity. During construction, the magnitude of change has been assessed as **Low** and the resultant effects of the CWP Project 'alone' have been assessed to be **Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of the NISA OWF and Dublin Array OWF in parts of TCA 4. During construction, given a cumulative baseline where the effects of the construction of the CWP Project's offshore infrastructure are added to those resulting from the construction of Dublin Array OWF with the operational presence of NISA OWF, the construction of the CWP Project's offshore infrastructure would have a reduced effect on TCA 4 due to the closer proximity of Dublin Array OWF. Works would be temporary in nature and short term in duration. The resultant magnitude of change would be **Low-Negligible** (medium-small in scale, short-term and limited in terms of geographical extent). The significance of effect would be **Not Significant** (not significant).
663. **TCA 5 Dalkey Island** has been assessed to be of **High-Medium** sensitivity. During construction, the magnitude of change has been assessed as **Medium** and the resultant effects of the CWP Project 'alone' have been assessed to be **Moderate** (not significant). The cumulative ZTVs indicate that there would be visibility of NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2 in much of TCA 5. During construction, given a cumulative baseline where the effects of the construction of the CWP Project's offshore infrastructure are added to those resulting from the construction of Dublin Array OWF and Arklow Bank OWF Phase 2 as well as the operational presence of NISA OWF, the construction of the CWP Project's offshore infrastructure would have a reduced effect on TCA 5 due to the closer proximity of Dublin Array OWF. Works would be temporary in nature and short term in duration. The resultant magnitude of change would be **Low** (medium-small in scale, short term and

wide in terms of geographical extent). The significance of effect would be **Slight** (not significant). **TCA 6 Killiney Bay** has been assessed to be of **High-Medium** sensitivity. During construction, the magnitude of change has been assessed as **Low** and the resultant effects of the CWP Project 'alone' have been assessed to be **Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of the Dublin Array OWF and Arklow Bank OWF Phase 2 in limited areas of TCA 6. During construction, given a cumulative baseline where the effects of the construction of the CWP Project's offshore infrastructure are added to those resulting from the construction of Dublin Array OWF (its construction programme aligning with CPW Project's offshore infrastructure) and Arklow Bank OWF Phase 2 (for Year 1 of CWP Project's offshore infrastructure construction plan and operational thereafter), the construction of the CWP Project's offshore infrastructure would have a reduced effect on TCA 6 due to the closer proximity of Dublin Array OWF. Works would be temporary in nature and short term in duration. The resultant magnitude of change would be **Low-Negligible** (medium-small in scale, short term and localised in terms of geographical extent). The significance of effect would be **Not Significant** (not significant).

664. **TCA 7 Shankill** has been assessed to be of **High-Medium** sensitivity. During construction, the magnitude of change has been assessed as **Low** and the resultant effects of the CWP Project 'alone' have been assessed to be **Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2 in limited areas of TCA 7. During construction, given a cumulative baseline where the effects of the construction of the CWP Project's offshore infrastructure are added to those resulting from the construction of Dublin Array OWF and Arklow Bank OWF Phase 2 (for Year 1 of CWP Project's offshore infrastructure and operational presence thereafter) plus the operational presence of NISA OWF, the construction of the CWP Project's offshore infrastructure would have a reduced effect on TCA 7 due to the closer proximity of Dublin Array OWF. Works would be temporary in nature and short term in duration. The resultant magnitude of change would be **Low-Negligible** (medium-small in scale, short-term and localised in terms of geographical extent). The significance of effect would be **Not Significant** (not significant).

Wicklow County Council Landscape Areas and Townscape Character Areas

665. **LA 1c. The Bray Mountains Group LA** has been assessed to be of **High-Medium** sensitivity. During construction, the magnitude of change has been assessed as **Medium-Low** and the resultant effects of the CWP Project 'alone' have been assessed to be **Moderate-Slight** (not significant). The cumulative ZTVs indicate that there would be intermittent visibility of Dublin Array OWF with some more limited visibility of Arklow Bank OWF Phase 2 and NISA OWF within LA 1c. During construction, given a cumulative baseline where the effects of the construction of the CWP Project's offshore infrastructure are added to those resulting from the construction of Dublin Array OWF, Arklow Bank OWF Phase 2 (its construction programme overlapping during Year 1 with piling for CWP Project's offshore infrastructure and operational presence thereafter) and the operational presence of NISA OWF, the construction of the CWP Project's offshore infrastructure would have a reduced effect on LA 1c due to the closer proximity of Dublin Array OWF. Works would be temporary in nature and short term in duration. The resultant magnitude of change would be **Negligible** (small in scale, short term and intermediate in terms of geographical extent). The significance of effect would be **Not Significant** (not significant).
666. **LA 1d. The North Eastern Valley LA** has been assessed to be of **High-Medium** sensitivity. During construction, the magnitude of change has been assessed as **Medium-Low** and the resultant effects of the CWP Project 'alone' have been assessed to be **Moderate-Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of Dublin Array OWF in parts of LA 1d and intermittent visibility of NISA OWF and Arklow Bank OWF Phase 2. During construction, given a cumulative baseline where the effects of the construction of the CWP Project's offshore infrastructure are added to those resulting from the construction of Dublin Array OWF and Arklow Bank OWF Phase 2 (its construction programme overlapping during Year 1 with piling for CWP Project's offshore infrastructure and operational thereafter) plus the operational presence of NISA OWF, the construction

of the CWP Project's offshore infrastructure would have a reduced effect on LA 1d due to the closer proximity of Dublin Array OWF. Works would be temporary in nature and short term in duration. The resultant magnitude of change would be **Negligible** (small in scale, short term and intermediate in terms of geographical extent). The significance of effect would be **Not Significant** (not significant).

667. **LA 2a. Northern Coastal Area LA** has been assessed to be of **High–Medium** sensitivity. During construction, the magnitude of change has been assessed as **Medium** and the resultant effects of the CWP Project 'alone' have been assessed to be **Moderate** (not significant). The cumulative ZTVs indicate that there would be visibility of the Dublin Array OWF and Arklow Bank OWF Phase 2 in much of LA 2a and intermittent visibility of NISA OWF. During construction, given a cumulative baseline where the effects of the construction of the CWP Project's offshore infrastructure are added to those resulting from the construction of Dublin Array OWF and Arklow Bank OWF Phase 2 (its construction programme overlapping during Year 1 with piling for CWP Project's offshore infrastructure and operational thereafter) plus the operational presence of NISA OWF, the construction of the CWP Project's offshore infrastructure would have a similar effect on LA 2a due to the visual separation between OWFs in views from LA 2a. Works would be temporary in nature and short term in duration. The resultant magnitude of change would remain **Medium** (medium in scale, short term and intermediate in terms of geographical extent). The significance of effect would be **Moderate** (not significant).
668. **LA 2b. Southern Coastal Area LA** has been assessed to be of **High–Medium** sensitivity. During construction, the magnitude of change has been assessed as **Medium–Low** and the resultant effects of the CWP Project 'alone' have been assessed to be **Moderate–Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of Arklow Bank OWF Phase 2 in much of LA 2b and intermittent visibility of Dublin Array OWF. During construction, given a cumulative baseline where the effects of the construction of the CWP Project's offshore infrastructure are added to those resulting from the construction of Dublin Array OWF and Arklow Bank OWF Phase 2 (its construction programme overlapping during Year 1 with piling for CWP Project's offshore infrastructure and operational thereafter), the construction of the CWP Project's offshore infrastructure would have a reduced effect on LA 2b due to the greater visibility of Arklow Bank OWF Phase 2 from LA 2b. Works would be temporary in nature and short term in duration. The resultant magnitude of change would be **Low** (medium–small in scale, short-term and intermediate in terms of geographical extent). The significance of effect would be **Slight** (not significant).
669. **LA 3a. North East Mountain Lowlands LA** has been assessed to be of **High–Medium** sensitivity. During construction, the magnitude of change has been assessed as **Medium–Low** and the resultant effects of the CWP Project 'alone' have been assessed to be **Moderate–Slight** (not significant). The cumulative ZTVs indicate that there would be intermittent visibility of NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2 in LA 3a. During construction, given a cumulative baseline where the effects of the construction of the CWP Project's offshore infrastructure are added to those resulting from the construction of Dublin Array OWF and Arklow Bank OWF Phase 2 (its construction programme overlapping during Year 1 with piling for CWP Project's offshore infrastructure and operational thereafter) and the operational presence of NISA OWF, the construction of the CWP Project's offshore infrastructure would have a similar effect on LA 3a due to the visual separation between the OWFs in views from LA 3a. Works would be temporary in nature and short term in duration. The resultant magnitude of change would remain **Medium–Low** (medium–small in scale, short term and intermediate in terms of geographical extent). The significance of effect would be **Moderate–Slight** (not significant).
670. **LA 3b. South East Mountain Lowlands LA** has been assessed to be of **High–Medium** sensitivity. During construction, the magnitude of change has been assessed as **Medium–Low** and the resultant effects of the CWP Project 'alone' have been assessed to be **Moderate–Slight** (not significant). The cumulative ZTVs indicate that there would be intermittent visibility of the Dublin Array OWF and Arklow Bank OWF Phase 2, and to a lesser extent NISA OWF in LA 3b. During construction, given a

cumulative baseline where the effects of the construction of the CWP Project's offshore infrastructure are added to those resulting from the construction of Dublin Array OWF and Arklow Bank OWF Phase 2 (during construction and on operation; its construction programme overlapping during Year 1 with piling for CWP Project's offshore infrastructure) and the operational presence of NSIA OWF, the construction of the CWP Project's offshore infrastructure would have a reduced effect on LA 3b due to the greater visibility of Arklow Bank OWF Phase 2 from LA 3b. Works would be temporary in nature and short term in duration. The resultant magnitude of change would be **Negligible** (small in scale, short term and intermediate in terms of geographical extent). The significance of effect would be **Not Significant** (not significant).

671. **TCA 6a Greystones** has been assessed to be of **High-Medium** sensitivity. During construction, the magnitude of change has been assessed as **Medium-Low** and the resultant effects of the CWP Project 'alone' have been assessed to be **Moderate-Slight** (not significant). The cumulative ZTVs indicate that there would be intermittent visibility of the NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2 in TCA 6a. During construction, given a cumulative baseline where the effects of the construction of the CWP Project's offshore infrastructure are added to those resulting from the Dublin Array OWF and Arklow Bank OWF Phase 2 (its construction programme overlapping during Year 1 with piling for CWP Project's offshore infrastructure and operational thereafter) and the operational presence of NISA OWF, the construction of the CWP Project's offshore infrastructure would have a similar effect on TCA 6a as CWP Project "alone" effects as it would remain the more prominent OWF. Works would be temporary in nature and short term in duration. The resultant magnitude of change would remain **Medium-Low** (medium-small in scale, short-term and intermediate in terms of geographical extent). The significance of effect would be **Moderate-Slight** (not significant).
672. **TCA 6b Kilcoole** has been assessed to be of **High-Medium** sensitivity. During construction, the magnitude of change has been assessed as **Medium-Low** and the resultant effects of the CWP Project 'alone' have been assessed to be **Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of the of Dublin Array OWF and Arklow Bank OWF Phase 2 in much of TCA 6b and intermittent visibility of NISA OWF. During construction, given a cumulative baseline where the effects of the construction of the CWP Project's offshore infrastructure are added to those resulting from the construction of Dublin Array OWF and Arklow Bank OWF Phase 2 (its construction programme overlapping during Year 1 with piling for CWP Project's offshore infrastructure and operational thereafter) plus the operational presence of NISA OWF, the construction of the CWP Project's offshore infrastructure would have a similar effect on TCA 6b as CWP Project "alone" effects as it would remain the more prominent OWF. Works would be temporary in nature and short term in duration. The resultant magnitude of change would remain **Medium-Low** (medium-small in scale, short term and intermediate in terms of geographical extent). The significance of effect would be **Slight** (not significant).
673. **TCA 6c Newcastle** has been assessed to be of **High-Medium** sensitivity. During construction, the magnitude of change has been assessed as **Medium-Low** and the resultant effects of the CWP Project 'alone' have been assessed to be **Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of the Dublin Array OWF and Arklow Bank OWF Phase 2 in much of TCA 6c and intermittent visibility of NISA OWF. During construction, given a cumulative baseline where the effects of the construction of the CWP Project's offshore infrastructure are added to those resulting from the construction of Dublin Array OWF and Arklow Bank OWF Phase 2 (its construction programme overlapping during Year 1 with piling for CWP Project's offshore infrastructure and operational thereafter) plus the operational presence of NISA OWF, the construction of the CWP Project's offshore infrastructure would have a similar effect on TCA 6c as CWP Project "alone" effects as it would remain the more prominent OWF. Works would be temporary in nature and short term in duration. The resultant magnitude of change would remain **Medium-Low** (medium-small in scale, short term and intermediate in terms of geographical extent). The significance of effect would be **Slight** (not significant).

674. **TCA 6d Wicklow** has been assessed to be of **High–Medium** sensitivity. During construction, the magnitude of change has been assessed as **Medium–Low** and the resultant effects of the CWP Project ‘alone’ have been assessed to be **Moderate–Slight** (not significant). The cumulative ZTVs indicate that there would be intermittent visibility of NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2 in TCA 6d. During construction, given a cumulative baseline where the effects of the construction of the CWP Project’s offshore infrastructure are added to those resulting from the construction of Dublin Array OWF and Arklow Bank OWF Phase 2 (its construction programme overlapping during Year 1 with piling for CWP Project’s offshore infrastructure) and thereafter its operational presence, and the operational presence of NISA OWF, the construction of the CWP Project’s offshore infrastructure would have a similar effect on TCA 6d as CWP Project “alone” effects as it would remain the more prominent OWF. Works would be temporary in nature and short term in duration. The resultant magnitude of change would remain **Medium–Low** (medium–small in scale, short-term and intermediate in terms of geographical extent). The significance of effect would be **Moderate–Slight** (not significant).

National designated landscape receptors

675. **Bray Head Special Amenity Area (SAA)** has been assessed in **Chapter 15 SLVIA** as having potential effects of **Slight** significance or above during construction. The SAA has been assessed as of **High** sensitivity. During construction, the magnitude of change has been assessed as **Medium–Low** for both landscape character and visual amenity and the resultant effects of CWP Project ‘alone’ have been assessed to be **Moderate** (not significant). The cumulative ZTVs indicate that there would be intermittent visibility of Dublin Array OWF with some more limited visibility of Arklow Bank OWF Phase 2 and NISA OWF within Bray Head SAA. During construction, given a cumulative baseline where the effects of the construction of the CWP Project’s offshore infrastructure are added to those resulting from the construction of Dublin Array OWF and Arklow Bank OWF Phase 2 (its construction programme overlapping during Year 1 with piling for CWP Project’s offshore infrastructure) and the operational presence of NISA OWF, the construction of the CWP Project’s offshore infrastructure would have a reduced effect on Bray Head SAA due to the closer proximity of Dublin Array OWF. Works would be temporary in nature and short term in duration. The resultant magnitude of change for both landscape character and visual amenity would be **Low–Negligible** (medium–small in scale, short term and intermediate in terms of geographical extent). The significance of effect would be **Not Significant** (not significant).

Visual amenity

Visual receptor groups

676. The following visual receptor groups are assessed in **Chapter 15 Seascape, Landscape & Visual Impact Assessment** as having potential effects of **Slight** significance or above during construction:
- Visual Receptor Group 2 Killiney to Bray;
 - Visual Receptor Group 3 Bray Head to Cliff Manor;
 - Visual Receptor Group 4 Cliff Manor, Greystones, Kilcoole to Five Mile Point;
 - Visual Receptor Group 5 Wicklow to Wicklow Head;
 - Visual Receptor Group 6 Dublin and Bray Mountains;
 - Visual Receptor Group 7 Mountain Uplands;
 - Visual Receptor Group 8 Wicklow Head to Brittas Bay; and
 - Visual Receptor Group 9 Marine Recreational Receptors.

677. **Visual Receptor Group 2 Killiney to Bray** has been assessed to be of **High–Medium** sensitivity. During construction, the magnitude of change has been assessed as **Medium–Low** and the resultant effects of the CWP Project ‘alone’ have been assessed to be **Moderate–Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of Dublin Array OWF and Arklow Bank OWF Phase 2 from parts of this visual receptor group, with Dublin Array OWF located closer to this Visual Receptor Group than the CWP Project. During construction, given a cumulative baseline where the effects of the construction of the CWP Project’s offshore infrastructure are added to those resulting from the construction of Dublin Array OWF (its construction programme aligning with CWP Project’s offshore infrastructure programme) and Arklow Bank OWF Phase 2 (noting after Year 1 of CWP Project’s offshore infrastructure construction programme its presence operationally), the construction of the CWP Project would have a reduced effect on this Visual Receptor Group due to the closer proximity of Dublin Array OWF. Works would be temporary in nature and short term in duration. The resultant magnitude of change would be **Low** (medium–small in scale, short term and intermediate / wide in terms of geographical extent). The significance of effect would be **Slight** (not significant).
678. **Visual Receptor Group 3 Bray Head to Cliff Manor** has been assessed to be of **High** sensitivity. During construction, the magnitude of change has been assessed as **Medium–Low** and the resultant effects of the CWP Project ‘alone’ have been assessed to be **Moderate** (not significant). The cumulative ZTVs indicate that there would be visibility of Dublin Array OWF, Arklow Bank OWF Phase 2 and NISA OWF from parts of this visual receptor group, with Dublin Array OWF located closer to this Visual Receptor Group than the CWP Project. During construction, given a cumulative baseline where the effects of the construction of the CWP Project’s offshore infrastructure are added to those resulting from the construction of Dublin Array OWF (which aligns with CWP Project’s offshore infrastructure construction programme), Arklow Bank OWF Phase 2 (overlapping during construction with Year 1 of CWP’s project’ offshore infrastructure with an operational presence thereafter) plus the operational presence of NISA OWF, the construction of the CWP Project would have a reduced effect on this visual receptor group due to the closer proximity of Dublin Array OWF. Works would be temporary in nature and short term in duration. The resultant magnitude of change would be **Low–Negligible** (medium–small in scale, short term and intermediate in terms of geographical extent). The significance of effect would be **Not Significant** (not significant).
679. **Visual Receptor Group 4 Cliff Manor, Greystones, Kilcoole to Five Mile Point** has been assessed to be of **High–Medium** sensitivity. During construction, the magnitude of change has been assessed as **Medium** and the resultant effects of the CWP Project ‘alone’ have been assessed to be **Moderate** (not significant). The cumulative ZTVs indicate that there would be visibility of NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, with Dublin Array OWF located slightly closer to this Visual Receptor Group than CWP Project’s offshore infrastructure. During construction, given a cumulative baseline where the effects of the construction of the CWP Project’s offshore infrastructure are added to those resulting from the construction of Dublin Array OWF (which aligns with CWP Project’s offshore infrastructure construction programme) and Arklow Bank OWF Phase 2 (overlapping during construction with Year 1 of CWP’s project’ offshore infrastructure with an operational presence thereafter) plus the operational presence of NISA OWF, the construction of the CWP Project would have a slightly reduced effect on this visual receptor group. Works would be temporary in nature and short term in duration. The resultant magnitude of change would be **Medium–Low** (large–medium in scale, short term and wide in terms of geographical extent). The significance of effect would be **Moderate–Slight** (not significant).
680. **Visual Receptor Group 5 Wicklow to Wicklow Head** has been assessed to be of **High–Medium** sensitivity. During construction, the magnitude of change has been assessed as **Medium** and the resultant effects of the CWP Project ‘alone’ have been assessed to be **Moderate** (not significant). The cumulative ZTVs indicate that the main combined visibility from this visual receptor group would be visibility of Dublin Array OWF with the CWP Project. During construction, given a cumulative baseline where the effects of the construction of the CWP Project’s offshore infrastructure are added to those resulting from the construction of Dublin Array OWF (which aligns with CWP Project’s offshore

infrastructure construction programme) and Arklow Bank OWF Phase 2 (for Year 1 of CWP' Project's offshore infrastructure and its operational presence thereafter), as well as the operational presence of NISA OWF), the construction of the CWP Project would not have an increased effect on this visual receptor group due to the visual separation between OWFs. Works would be temporary in nature and short term in duration. The resultant magnitude of change would be **Medium** (medium in scale, short-term and intermediate / wide in terms of geographical extent). The significance of effect would be **Moderate** (not significant).

681. **Visual Receptor Group 6 Dublin and Bray Mountains** has been assessed to be of **High–Medium** sensitivity. During construction, the magnitude of change has been assessed as **Medium–Low** and the resultant effects of the CWP Project 'alone' have been assessed to be **Moderate–Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of Dublin Array OWF, Arklow Bank OWF Phase 2 and NISA OWF from this visual receptor group, which consists of a number of high points in the landscape. During construction, given a cumulative baseline where the effects of the construction of the CWP Project's offshore infrastructure are added to those resulting from the construction of Dublin Array OWF (which aligns with CWP Project's offshore infrastructure construction programme), Arklow Bank OWF Phase 2 (for Year 1 of CWP' Project's offshore infrastructure and its operational presence thereafter), as well as the operational presence of NISA OWF, the construction of the CWP Project would have a slightly reduced effect on this visual receptor group due to the closer proximity of Dublin Array OWF. Works would be temporary in nature and short term in duration. The resultant magnitude of change would be **Low–Negligible** (medium–small in scale, short term and intermediate in terms of geographical extent). The significance of effect would be **Not Significant** (not significant).
682. **Visual Receptor Group 7 Mountain Uplands** has been assessed to be of **High–Medium** sensitivity. During construction, the magnitude of change has been assessed as **Medium–Low** and the resultant effects of the CWP Project 'alone' have been assessed to be **Moderate–Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of Dublin Array OWF, Arklow Bank OWF Phase 2 and to a lesser extent NISA OWF from this visual receptor group consisting of high points in the landscape. During construction, given a cumulative baseline where the effects of the construction of the CWP Project's offshore infrastructure are added to those resulting from the construction of Dublin Array OWF (which aligns with CWP Project's offshore infrastructure construction programme), Arklow Bank OWF Phase 2 (for Year 1 of CWP' Project's offshore infrastructure and its operational presence thereafter), as well as the operational presence of NISA OWF, the construction of the CWP Project would not have an increased effect on this visual receptor group. Works would be temporary in nature and short term in duration. The resultant magnitude of change would be **Medium–Low** (medium in scale, short-term and intermediate / localised in terms of geographical extent). The significance of effect would be **Moderate–Slight** (not significant).
683. **Visual Receptor Group 8 Wicklow Head to Brittas Bay** has been assessed to be of **High–Medium** sensitivity. During construction, the magnitude of change has been assessed as **Medium–Low** and the resultant effects of the CWP Project 'alone' have been assessed to be **Moderate–Slight** (not significant). The cumulative ZTVs indicate that the main combined visibility from this visual receptor group would be visibility of Arklow Bank OWF Phase 2 with the CWP Project. During construction, given a cumulative baseline where the effects of the construction of the CWP Project's offshore infrastructure are added to those resulting from the construction of Arklow Bank OWF Phase 2 (for Year 1 of CWP' Project's offshore infrastructure and its operational presence thereafter), the construction of the CWP Project would have a slightly reduced effect on this visual receptor group due to the closer proximity of Arklow Bank OWF Phase 2. Works would be temporary in nature and short term in duration. The resultant magnitude of change would be **Low–Negligible** (medium–small in scale, short term and intermediate in terms of geographical extent). The significance of effect would be **Not Significant** (not significant).

684. **Visual Receptor Group 9 Marine Recreational Receptors** has been assessed to be of **High–Medium** sensitivity. During construction, the magnitude of change has been assessed as **Medium** and the resultant effects of the CWP Project ‘alone’ have been assessed to be **Moderate** (not significant). The cumulative ZTVs indicate that during construction there would be potential for combined visibility from this visual receptor group with NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2. During construction, given a cumulative baseline where the effects of the construction of the CWP Project’s offshore infrastructure are added to those resulting from the construction of Dublin Array OWF (which aligns with CWP Project’s offshore infrastructure construction programme), Arklow Bank OWF Phase 2 (for Year 1 of CWP Project’s offshore infrastructure and its operational presence thereafter), as well as the operational presence of NISA OWF, the construction of the CWP Project’s offshore infrastructure would not have an increased effect on this visual receptor group. Works would be temporary in nature and short term in duration. The resultant magnitude of change would be **Medium** (large–medium in scale, short term and wide in terms of geographical extent). The significance of effect would be **Moderate** (not significant).

Main (named) settlements

685. The following Main (Named) Settlements have been assessed in **Chapter 15 Seascape, Landscape & Visual Impact Assessment** as having potential effects of **Slight** significance or above during construction:
- Killiney (covering Shankill to the south);
 - Bray;
 - Greystones;
 - Kilcoole; and
 - Wicklow
686. **Killiney** (covering Shankill to the south) has been assessed to be of **High–Medium** sensitivity. During construction, the magnitude of change has been assessed as **Medium–Low** and the resultant effects of the CWP Project ‘alone’ have been assessed to be **Moderate–Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2 from locations within Killiney, with Dublin Array OWF located slightly closer to this settlement than the CWP Project. During construction, given a cumulative baseline where the effects of the construction of the CWP Project’s offshore infrastructure are added to those resulting from the construction of Dublin Array OWF (which aligns with CWP Project’s offshore infrastructure construction programme), Arklow Bank OWF Phase 2 (for Year 1 of CWP Project’s offshore infrastructure and its operational presence thereafter), as well as the operational presence of NISA OWF, the construction of the CWP Project’s offshore infrastructure would have a slightly reduced effect in views from the settlement due to the closer proximity of Dublin Array OWF. Works would be temporary in nature and short term in duration. The resultant magnitude of change would be **Medium–Low** (medium–small in scale, short term and intermediate in terms of geographical extent). The significance of effect would be **Moderate–Slight** (not significant).
687. **Bray** has been assessed to be of **High–Medium** sensitivity. During construction, the magnitude of change has been assessed as **Medium–Low** and the resultant effects of the CWP Project ‘alone’ have been assessed to be **Moderate–Slight** (not significant). The cumulative ZTVs indicate that there is mostly likely to be visibility of NISA OWF and Dublin Array OWF from locations within Bray, with Dublin Array OWF located slightly closer to this settlement than the CWP Project. During construction, given a cumulative baseline where the effects of the construction of the CWP Project’s offshore infrastructure are added to those resulting from the construction of Dublin Array OWF (which aligns with CWP Project’s offshore infrastructure construction programme) as well as the operational presence of NISA OWF, the construction of the CWP Project would have a slightly reduced effect in views from the settlement. Works would be temporary in nature and short term in duration. The resultant magnitude

of change would be **Medium–Low** (medium–small in scale, short term and intermediate in terms of geographical extent). The significance of effect would be **Moderate–Slight** (not significant).

688. **Greystones** has been assessed to be of **High–Medium** sensitivity. During construction, the magnitude of change has been assessed as **Medium** and the resultant effects of the CWP Project 'alone' have been assessed to be **Moderate** (not significant). The cumulative ZTVs indicate that there is mostly likely to be visibility of NISA OWF and Dublin Array OWF from locations within Greystones, with Dublin Array OWF located slightly closer to this settlement than the CWP Project. During construction, given a cumulative baseline where the effects of the construction of the CWP Project's offshore infrastructure are added to those resulting from the construction of Dublin Array OWF (which aligns with CWP Project's offshore infrastructure construction programme) as well as the operational presence of NISA OWF, the construction of the CWP Project's offshore infrastructure would have a slightly reduced effect in views from the settlement. Works would be temporary in nature and short term in duration. The resultant magnitude of change would be **Medium–Low** (medium–small in scale, short term and wide/intermediate in terms of geographical extent). The significance of effect would be **Moderate–Slight** (not significant).
689. **Kilcoole** has been assessed to be of **High–Medium** sensitivity. During construction, the magnitude of change has been assessed as **Medium** and the resultant effects of the CWP Project 'alone' have been assessed to be **Moderate** (not significant). The cumulative ZTVs indicate that there would be visibility of NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2 from locations within Kilcoole. The construction of the CWP Project would be further from the viewpoint than the construction of Dublin Array OWF (which aligns with CWP Project's offshore infrastructure construction programme). Works would be temporary in nature and short term in duration. The resultant magnitude of change would be **Medium** (medium in scale, short-term and wide in terms of geographical extent). The significance of effect would be **Moderate** (not significant).
690. **Wicklow** has been assessed to be of **High–Medium** sensitivity. During construction, the magnitude of change has been assessed as **Medium** and the resultant effects of the CWP Project 'alone' have been assessed to be **Moderate** (not significant). The cumulative ZTVs indicate that there would be visibility of NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2 from locations within Wicklow. The construction of the CWP Project's offshore infrastructure would be closer to the viewpoint than construction of Dublin Array OWF (which aligns with CWP Project's offshore infrastructure construction programme). Works would be temporary in nature and short term in duration. The resultant magnitude of change would remain **Medium** (medium in scale, short term and wide in terms of geographical extent). The significance of effect would be **Moderate** (not significant).

Key routes

691. The following key routes have been assessed in **Chapter 15 Seascape, Landscape & Visual Impact Assessment** as having potential effects of **Slight** significance or above during construction:
- R119 Road;
 - R750 Road;
 - DART Line (Dublin to Greystones) / Dublin to Rosslare Main Line (Greystones to Wicklow)
 - Southern Sea approach to Dublin Port (Dublin to Cherbourg);
 - Bray – Greystone Coastal Walk;
 - Greystone to Wicklow Trail; and
 - The Wicklow Way.
692. **R119 Road** has been assessed to be of **Medium** sensitivity. During construction, the magnitude of change has been assessed as **Medium–Low** and the resultant effects of the CWP Project 'alone' have been assessed to be **Slight** (not significant) for section b (Dalkey / Sorrento Point to Shankill / Ballybrack (Seafield Road)). The cumulative ZTVs indicate that there would be intermittent visibility of

NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2 from locations along section b of the R119, with Dublin Array OWF located closer to the road than the CWP Project. During construction, given a cumulative baseline where the effects of the construction of the CWP Project's offshore infrastructure are added to those resulting from the construction of Dublin Array OWF, Arklow Bank OWF Phase 2 (for Year 1 of CWP Project's offshore infrastructure and its operational presence thereafter) and the operational phase of NISA OWF, the construction of the CWP Project's offshore infrastructure would have a reduced effect on users of this road due to the closer proximity of Dublin Array OWF. Works would be temporary in nature and short term in duration. The resultant magnitude of change would be **Low–Negligible** (medium–small in scale, short term and intermediate in terms of geographical extent). The significance of effect would be **Not Significant** (not significant).

693. **R750 Road** has been assessed to be of **High–Medium** sensitivity. During construction, the magnitude of change has been assessed as **Medium–Low** and the resultant effects of the CWP Project 'alone' have been assessed as **Moderate–Slight** (not significant) for section b (Brittas to Mizen Head) and section d (Ennereilly (just south of Sallymount) to Aisling / Seabank). The cumulative ZTVs indicate that there would be visibility of Arklow Bank OWF Phase 2 from locations along sections b and d of the R750 and occasional visibility of Dublin Array OWF, with the construction of Arklow Bank OWF Phase 2 located closer to the road than the CWP Project. During construction, given a cumulative baseline where the effects of the construction of the CWP Project's offshore infrastructure are added to those resulting from the construction of Dublin Array OWF and Arklow Bank OWF Phase 2 (for Year 1 of CWP Project's offshore infrastructure and its operational presence thereafter), the construction of the CWP Project's offshore infrastructure would have a reduced effect on users of this road due to the closer proximity of Arklow Bank OWF Phase 2. Works would be temporary in nature and short term in duration. The resultant magnitude of change for both sections b and d would be **Negligible** (small in scale, short term and intermediate in terms of geographical extent). The significance of effect would be **Not Significant** (not significant).
694. **DART line (Dublin to Greystones) / Dublin to Rosslare (Greystones to Wicklow)** has been assessed to be of **Medium** sensitivity overall. During construction, the magnitude of change has been assessed as **Medium–Low** and the resultant effects of the CWP Project 'alone' have been assessed as **Slight** (not significant) overall with variations for sections of route ranging between **Slight** (not significant) for section c (Dalkey / Sorrento Point to Bray) and **Moderate** (not significant) for section d (Bray Head to Wicklow). The cumulative ZTVs indicate that there would be intermittent visibility of NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2 from locations along the length of the DART line. At various points along the route, Dublin Array OWF or Arklow Bank OWF Phase 2 would be located closer to the DART line than construction of the CWP Project's offshore infrastructure. During construction, given a cumulative baseline where the effects of the construction of the CWP Project's offshore infrastructure are added to those resulting from the construction of Dublin Array OWF and Arklow Bank OWF Phase 2 (for Year 1 of CWP Project's offshore infrastructure and its operational presence thereafter), as well as the operational presence of NISA OWF, the construction of the CWP Project's offshore infrastructure would have a reduced effect on the DART line due to the closer proximity of Dublin Array OWF or Arklow Bank OWF Phase 2 during construction and operation. Works would be temporary in nature and short term in duration. The resultant magnitude of change for both section c and the overall route would be **Negligible** (small in scale, short term and intermediate in terms of geographical extent). The significance of effect would be **Not Significant** (not significant). The resultant magnitude of change for section d would remain **Medium** (large in scale, short term and intermediate in terms of geographical extent). The significance of effect would be **Moderate** (not significant).
695. **Southern Approach to approach to Dublin Port (Dublin to Cherbourg)** has been assessed to be of **Medium** sensitivity overall. During construction, the magnitude of change has been assessed as **Medium–Low** and the resultant effects of the CWP Project 'alone' have been assessed as **Slight** (not significant) overall with variations for sections of the route for section a (0-10 km) and section b (10-20 km from the outer edge of the array) of **Moderate / Moderate–Slight** (section a) or **Slight** (section

b). The cumulative ZTVs indicate that there would be visibility of the Dublin Array OWF and Arklow Bank OWF Phase 2 from this ferry route, with NISA OWF likely to be visible north of the CWP Project. At various points along the route, the construction of Dublin Array OWF or Arklow Bank OWF Phase 2 (for Year 1 of CWP Project's offshore infrastructure and its operational presence thereafter), would be located closer to the ferry route than construction of the CWP Project's offshore infrastructure. During construction, given a cumulative baseline where the effects of the construction of the CWP Project's offshore infrastructure are added to those resulting from the construction of Dublin Array OWF and Arklow Bank OWF Phase 2 (for Year 1 of CWP Project's offshore infrastructure and its operational presence thereafter), the construction of the CWP Project's offshore infrastructure would have a reduced effect on the southern approach to Dublin Port due to the closer proximity of Dublin Array OWF or Arklow Bank OWF Phase 2 during construction and operation. Works would be temporary in nature and short term in duration. The resultant magnitude of change for both section b, where the construction of Arklow Bank OWF Phase 2 would be closer to the ferry route, and the overall route would be **Negligible** (small in scale, short term and localised in terms of geographical extent). The significance of effect would be **Not Significant** (not significant). The resultant magnitude of change for section a would remain **Medium** (medium in scale, short-term and wide in terms of geographical extent). The significance of effect would be **Moderate / Moderate-Slight** (not significant).

696. **Bray-Greystones Cliff Walk** has been assessed to be of **High-Medium** sensitivity. During construction, the magnitude of change has been assessed as **Medium** and the resultant effects of the CWP Project 'alone' have been assessed as **Moderate** (not significant) overall with a **Moderate-Slight** (not significant effect for section a (Bray to Cliff Manor (northern section of the route)) and **Moderate** (not significant effect) for section b (Cliff Manor to Greystones (central and south section of the route)). The cumulative ZTVs indicate that there would be visibility of NISA OWF and Dublin Array OWF from the Cliff Walk, with intermittent visibility of Arklow Bank OWF Phase 2. During construction, given a cumulative baseline where the effects of the construction of the CWP Project's offshore infrastructure are added to those resulting from the construction of Dublin Array OWF and Arklow Bank OWF Phase 2 (for Year 1 of CWP Project's offshore infrastructure and its operational presence thereafter) as well as the operational presence of NISA OWF, the construction of the CWP Project's offshore infrastructure would have a reduced effect on the Bray-Greystones Cliff Walk due to the closer proximity of Dublin Array OWF. Works would be temporary in nature and short term in duration. The resultant magnitude of change for the overall route and sections a and b would be **Low** (medium-small in scale, short-term and wide / intermediate in terms of geographical extent). The significance of effect would be **Slight** (not significant).
697. **Greystones to Wicklow Trail** has been assessed of **High-Medium** sensitivity. During construction, the magnitude of change has been assessed as **Medium** and the resultant effects of the CWP Project 'alone' have been assessed as **Moderate** (not significant). The cumulative ZTVs indicate that there would be visibility of NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2 from most of the Trail. During construction, given a cumulative baseline where the effects of the construction of the CWP Project's offshore infrastructure are added to those resulting from the construction of Dublin Array OWF and Arklow Bank OWF Phase 2 (for Year 1 of CWP Project's offshore infrastructure and its operational presence thereafter) as well as the operational presence of NISA OWF, the construction of the CWP Project's offshore infrastructure would have a reduced effect on the Greystones to Wicklow Trail due to the closer proximity of Dublin Array OWF at the northern end of the route. Works would be temporary in nature and short term in duration. The resultant magnitude of change for the route would remain **Medium** (medium in scale, short term and wide / intermediate in terms of geographical extent). The significance of effect would be **Moderate** (not significant).
698. **The Wicklow Way** has been assessed to be of **High-Medium** sensitivity. During construction, the magnitude of change has been assessed as **Low** and the resultant effects of the CWP Project 'alone' have been assessed as **Slight** (not significant). The cumulative ZTVs indicate that there would be intermittent visibility of NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2 from locations

along the length of the Wicklow Way. During construction, given a cumulative baseline where the effects of the construction of the CWP Project's offshore infrastructure are added to those resulting from the construction of Dublin Array OWF and Arklow Bank OWF Phase 2 (for Year 1 of CWP Project's offshore infrastructure and its operational presence thereafter) as well as the operational presence of NISA OWF, the construction of the CWP Project's offshore infrastructure would be visually separate from the other OWFs. The resultant magnitude of change would remain **Low** (small in scale, short term and intermediate / localised in terms of geographical extent). The significance of effect would be **Slight** (not significant).

699. The SLVIA assessors judged that the CWP Project's offshore infrastructure 'alone' would have no significant adverse cumulative effects during construction (daytime).

Cumulative Impact 2: Direct / indirect temporary nighttime impacts on seascape / landscape and townscape / national designated landscapes and visual receptors.

Seascape receptors

700. The following Regional Seascape Character Areas (RSCAs) have been assessed in **Chapter 15 Seascape, Landscape & Visual Impact Assessment** as having potential effects of **Slight** significance or above at night during construction:
- RSCA 13 South Irish Sea; and
 - RSCA 14 Irish Sea, Sandbank and Broad Bays.
701. **RSCA 13 South Irish Sea** has been assessed to be of **Medium** sensitivity. During construction (nighttime) the magnitude of change has been assessed as **Low** and the resultant effects of the CWP Project 'alone' have been assessed to be **Slight** (not significant). The operational Arklow Bank OWF Phase 1 is located within this RSCA. Arklow Bank OWF Phase 2 would be located within this RSCA, with Dublin Array OWF located approximately 22.5 km north of the RSCA and NISA OWF approximately 70.2 km north. During construction (night-time), given a cumulative baseline where the effects of the construction of the CWP Project's offshore infrastructure are added to the construction of Arklow Bank OWF Phase 2, Dublin Array OWF (its construction programme overlapping during Year 1 with piling for CWP Project's offshore infrastructure) and the operational presence of NISA OWF, the lighting associated with the construction of the CWP Project's offshore infrastructure would have a reduced effect on this RSCA as the main effects on the RSCA would result from the presence of construction and operational lighting at Arklow Bank OWF Phase 2. Works would be temporary in nature and short term in duration. The resultant magnitude of change would be **Low–Negligible** (medium–small in scale, short term and localised in terms of geographical extent). The significance of effect would be **Not Significant** (not significant).
702. **RSCA 14 Irish Sea, Sandbank and Broad Bays** has been assessed to be of **Medium** sensitivity. During construction (nighttime), the magnitude of change has been assessed as **Medium–Low** and the resultant effects of the CWP Project 'alone' have been assessed to be **Slight** (not significant). Dublin Array OWF would be partly located within this RSCA, with NISA OWF approximately 41.4 km north of the RSCA and Arklow Bank OWF Phase 2 located approximately 4.1 km south. During construction (night-time), given a cumulative baseline where the construction lighting at the CWP Project's offshore infrastructure is added to the construction lighting of Dublin Array OWF, Arklow Bank OWF Phase 2 (for Year 1 of CWP Project's offshore infrastructure and thereafter its operational lighting), and the operational presence of NISA OWF, the lighting associated with the construction of the CWP Project's offshore infrastructure would have a reduced effect on this RSCA as construction lighting at Dublin Array OWF would already affect this RSCA. Works would be temporary in nature and short term in duration. The resultant magnitude of change would be **Medium–Low** (medium in scale,

short term and intermediate in terms of geographical extent). The significance of effect would be **Slight** (not significant).

Landscape / townscape character receptors

703. The following Landscape / Townscape Character Areas have been assessed in **Chapter 15 Seascape, Landscape & Visual Impact Assessment** as having potential effects of **Slight** significance or above at night during construction:

- Dun Laoghaire–Rathdown County Council Landscape and Townscape Character Areas
 - LCA 10. Rathmichael;
 - LCA 11. Ballyman;
 - LCA 12. Shanganagh;
 - TCA 4 Dalkey;
 - TCA 5 Dalkey Island;
 - TCA 6 Killiney Bay; and
 - TCA 7 Shankill.
- Wicklow County Council Landscape Areas and Townscape Character Areas
 - LA 1c. The Bray Mountains Group;
 - LA 1d. The North Eastern Valley;
 - LA 2a. Northern Coastal Area;
 - LA 2b. Southern Coastal Area;
 - LA 3a. North East Mountain Lowlands;
 - LA 3b. South East Mountain Lowlands;
 - TCA 6a Greystones;
 - TCA 6b Kilcoole;
 - TCA 6c Newcastle; and
 - TCA 6d Wicklow.

Dun Laoghaire–Rathdown County Council Landscape and Townscape Character Areas

704. **LCA 10. Rathmichael** has been assessed to be of **Medium** sensitivity. During construction (nighttime), the magnitude of change has been assessed as **Medium–Low** and the resultant effects of the CWP Project ‘alone’ have been assessed to be **Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of NISA OWF and Dublin Array OWF throughout much of LCA 10. During construction (night-time), given a cumulative baseline where the effects of the construction of the CWP Project’s offshore infrastructure are added to the construction lighting of Dublin Array OWF (which would follow the same construction programme as CWP Project’s offshore infrastructure) and lighting associated with the operational presence of NISA OWF, the construction lighting of the CWP Project’s offshore infrastructure would have a reduced effect on LCA 10 due to the closer proximity of Dublin Array OWF. Works would be temporary in nature and short term in duration. The resultant magnitude of change would be **Negligible** (small in scale, short term and wide/intermediate in terms of geographical extent). The significance of effect would be **Not Significant** (not significant).

705. **LCA 11. Ballyman** has been assessed to be of **Medium** sensitivity. During construction (nighttime), the magnitude of change has been assessed as **Medium–Low** and the resultant effects of the CWP Project ‘alone’ have been assessed to be **Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of Dublin Array OWF throughout much of LCA 11, with more intermittent visibility of NISA OWF. During construction (night-time), given a cumulative baseline where the effects of the construction lighting at the CWP Project’s offshore infrastructure is added to the construction lighting of Dublin Array OWF (which would follow the same construction programme as CWP Project’s offshore infrastructure) and operational lighting of NISA, the construction lighting of the CWP Project’s offshore infrastructure would have a reduced effect on LCA 11 due to the closer proximity of Dublin

Array OWF. Works would be temporary in nature and short term in duration. The resultant magnitude of change would be **Negligible** (small in scale, short term and intermediate in terms of geographical extent). The significance of effect would be **Not Significant** (not significant).

706. **LCA 12. Shanganagh** has been assessed to be of **Medium** sensitivity. During construction (nighttime), the magnitude of change has been assessed as **Medium-Low** and the resultant effects of the CWP Project 'alone' have been assessed to be **Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of Dublin Array OWF throughout much of LCA 12, with more intermittent visibility of NISA OWF. During construction (night-time), given a cumulative baseline where the effects of the construction lighting at the CWP Project's offshore infrastructure is added to the construction lighting of Dublin Array OWF and the lighting associated with the operational presence of NISA OWF, the construction lighting of the CWP Project's offshore infrastructure would have a reduced effect on LCA 12 due to the closer proximity of Dublin Array OWF. Works would be temporary in nature and short term in duration. The resultant magnitude of change would be **Low** (medium-small in scale, short term and intermediate in terms of geographical extent). The significance of effect would be **Slight** (not significant).
707. **TCA 4 Dalkey** has been assessed to be of **High-Medium** sensitivity. During construction (night-time), the magnitude of change has been assessed as **Low** and the resultant effects of the CWP Project 'alone' have been assessed to be **Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of NISA OWF and Dublin Array OWF in parts of TCA 4. During construction (night-time), given a cumulative baseline where the effects of the construction lighting at the CWP Project's offshore infrastructure is added to the construction lighting of Dublin Array OWF and the operational presence of NISA OWF, the construction lighting of the CWP Project's offshore infrastructure would have a reduced effect on TCA 4 due to the closer proximity of Dublin Array OWF. Works would be temporary in nature and short term in duration. The resultant magnitude of change would be **Low-Negligible** (medium-small in scale, short term and limited in terms of geographical extent). The significance of effect would be **Not Significant** (not significant).
708. **TCA 5 Dalkey Island** has been assessed to be of **High-Medium** sensitivity. During construction (night-time), the magnitude of change has been assessed as **Medium** and the resultant effects of the CWP Project 'alone' have been assessed to be **Moderate** (not significant). The cumulative ZTVs indicate that there would be visibility of NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2 in much of TCA 5. During construction (night-time), given a cumulative baseline where the effects of the construction lighting at the CWP Project's offshore infrastructure is added to the construction lighting of Dublin Array OWF and Arklow Bank OWF Phase 2 (both during construction and in operation) and the operational presence of NISA OWF, the construction lighting of the CWP Project's offshore infrastructure would have a reduced effect on TCA 5 due to the closer proximity of Dublin Array OWF. Works would be temporary in nature and short term in duration. The resultant magnitude of change would be **Low** (medium-small in scale, short term and wide in terms of geographical extent). The significance of effect would be **Slight** (not significant).
709. **TCA 6 Killiney Bay** has been assessed to be of **High-Medium** sensitivity. During construction (night-time), the magnitude of change has been assessed as **Low** and the resultant effects of the CWP Project 'alone' have been assessed to be **Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of Dublin Array OWF and Arklow Bank OWF Phase 2 in limited areas of TCA 6. During construction (night-time), given a cumulative baseline where the effects of the construction lighting at the CWP Project's offshore infrastructure is added to the construction lighting of Dublin Array OWF (its construction programme aligning with CPW Project's offshore infrastructure) and Arklow Bank OWF Phase 2 (for Year 1 of CWP Project's offshore infrastructure and thereafter during operation), the construction lighting of the CWP Project's offshore infrastructure would have a reduced effect on TCA 6 due to the closer proximity of Dublin Array OWF. Works would be temporary in nature and short term in duration. The resultant magnitude of change would be **Low-Negligible** (medium-

small in scale, short-term and localised in terms of geographical extent). The significance of effect would be **Not Significant** (not significant).

710. **TCA 7 Shankill** has been assessed to be of **High–Medium** sensitivity. During construction (night-time), the magnitude of change has been assessed as **Low** and the resultant effects of the CWP Project ‘alone’ have been assessed to be **Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2 in limited areas of TCA 7. During construction (night-time), given a cumulative baseline where the effects of the construction lighting at the CWP Project’s offshore infrastructure is added to the construction lighting of Dublin Array OWF and Arklow Bank OWF Phase 2 (for Year 1 of CWP Project’s offshore infrastructure and thereafter during operation) and the operational presence of NISA OWF, the construction lighting of the CWP Project’s offshore infrastructure would have a reduced effect on TCA 7 due to the closer proximity of Dublin Array OWF. Works would be temporary in nature and short term in duration. The resultant magnitude of change would be **Low–Negligible** (medium–small in scale, short term and localised in terms of geographical extent). The significance of effect would be **Not Significant** (not significant).

Wicklow County Council Landscape Areas and Townscape Character Areas

711. **LA 1c. The Bray Mountains Group** has been assessed to be of **High–Medium** sensitivity. During construction (nighttime), the magnitude of change has been assessed as **Medium–Low** and the resultant effects of the CWP Project ‘alone’ have been assessed to be **Moderate–Slight** (not significant). The cumulative ZTVs indicate that there would be intermittent visibility of Dublin Array OWF with some more limited visibility of Arklow Bank OWF Phase 2 and NISA OWF within LA 1c~~Phase 2~~~~Phase 2~~. During construction (night-time), given a cumulative baseline where the effects of the construction lighting at the CWP Project’s offshore infrastructure is added to the construction lighting of Dublin Array OWF, Arklow Bank OWF Phase 2 (its construction programme overlapping during Year 1 with piling for CWP Project’s offshore infrastructure) and the operational presence of NISA OWF, the construction lighting of the CWP Project’s offshore infrastructure would have a reduced effect on LA 1c due to the closer proximity of Arklow Bank OWF Phase 2 and after Year 1 of CWP Project’s offshore infrastructure construction programme its presence operationally). Works would be temporary in nature and short term in duration. The resultant magnitude of change would be **Negligible** (small in scale, short term and intermediate in terms of geographical extent). The significance of effect would be **Not Significant** (not significant).
712. **LA 1d. The North Eastern Valley** has been assessed to be of **High–Medium** sensitivity. During construction (nighttime), the magnitude of change has been assessed as **Medium–Low** and the resultant effects of the CWP Project ‘alone’ have been assessed to be **Moderate–Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of Dublin Array OWF in parts of LA 1d and intermittent visibility of NISA OWF and Arklow Bank OWF Phase 2. During construction (nighttime), given a cumulative baseline where the effects of the construction lighting at the CWP Project’s offshore infrastructure is added to the construction lighting of Dublin Array OWF and Arklow Bank OWF Phase 2 (its construction programme overlapping during Year 1 with piling for CWP Project’s offshore infrastructure and thereafter operation) and the operational presence of NISA OWF, the construction lighting of the CWP Project’s offshore infrastructure would have a reduced effect on LA 1d due to the closer proximity of Dublin Array OWF. Works would be temporary in nature and short term in duration. The resultant magnitude of change would be **Negligible** (small in scale, short term and intermediate in terms of geographical extent). The significance of effect would be **Not Significant** (not significant).
713. **LA 2a. Northern Coastal Area** has been assessed to be of **High–Medium** sensitivity. During construction (nighttime), the magnitude of change has been assessed as **Medium** and the resultant effects of the CWP Project ‘alone’ have been assessed to be **Moderate** (not significant). The cumulative ZTVs indicate that there would be visibility of Dublin Array OWF and Arklow Bank OWF Phase 2 in much of LA 2a and intermittent visibility of NISA OWF. During construction (nighttime),

given a cumulative baseline where the effects of the construction lighting at the CWP Project's offshore infrastructure is added to the construction lighting of Dublin Array OWF and Arklow Bank OWF Phase 2 (its construction programme overlapping during Year 1 with piling for CWP Project's offshore infrastructure and thereafter its operational presence) and the operational presence of NISA OWF, the construction lighting of the CWP Project's offshore infrastructure would have a similar effect on LA 2a due to the visual separation between OWFs in views from LA 2a. Works would be temporary in nature and short term in duration. The resultant magnitude of change would remain **Medium** (medium in scale, short-term and intermediate in terms of geographical extent). The significance of effect would be **Moderate** (not significant).

714. **LA 2b. Southern Coastal Area** has been assessed to be of **High-Medium** sensitivity. During construction (nighttime), the magnitude of change has been assessed as **Medium** and the resultant effects of the CWP Project 'alone' have been assessed to be **Moderate-Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of Arklow Bank OWF Phase 2 in much of LA 2b and intermittent visibility of Dublin Array OWF. During construction (nighttime), given a cumulative baseline where the effects of the construction lighting at the CWP Project's offshore infrastructure is added to the construction lighting of Dublin Array OWF and Arklow Bank OWF Phase 2 (its construction programme overlapping during Year 1 with piling for CWP Project's offshore infrastructure), the construction lighting of the CWP Project's offshore infrastructure would have a reduced effect on LA 2b due to the visibility of Arklow Bank OWF Phase 2 from LA 2b (and after Year 1 of CWP Project's offshore infrastructure construction programme its presence operationally). Works would be temporary in nature and short term in duration. The resultant magnitude of change would be **Low** (medium-small in scale, short-term and intermediate in terms of geographical extent). The significance of effect would be **Slight** (not significant).
715. **LA 3a. North East Mountain Lowlands** has been assessed to be of **High-Medium** sensitivity. During construction (nighttime), the magnitude of change has been assessed as **Medium-Low** and the resultant effects of the CWP Project 'alone' have been assessed to be **Moderate-Slight** (not significant). The cumulative ZTVs indicate that there would be intermittent visibility of NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2 in LA 3a. During construction (nighttime), given a cumulative baseline where the effects of the construction lighting at the CWP Project's offshore infrastructure is added to the construction lighting at Dublin Array OWF and Arklow Bank OWF Phase 2 (its construction programme overlapping during Year 1 with piling for CWP Project's offshore infrastructure and thereafter operationally) and thereafter operationally and the operational presence of NISA OWF, the construction lighting of the CWP Project's offshore infrastructure would have a similar effect on LA 3a as CWP Project "alone" due to the visual separation between OWFs in views from LA 3a. Works would be temporary in nature and short term in duration. The resultant magnitude of change would remain **Medium-Low** (medium-small in scale, short term and intermediate in terms of geographical extent). The significance of effect would be **Moderate-Slight** (not significant).
716. **LA 3b. South East Mountain Lowlands** has been assessed to be of **High-Medium** sensitivity. During construction (nighttime), the magnitude of change has been assessed as **Medium-Low** and the resultant effects of the CWP Project 'alone' have been assessed to be **Moderate-Slight** (not significant). The cumulative ZTVs indicate that there would be intermittent visibility of Dublin Array OWF and Arklow Bank OWF Phase 2, and to a lesser extent NISA OWF in LA 3b. During construction (nighttime), given a cumulative baseline where the effects of the construction lighting at the CWP Project's offshore infrastructure is added to the construction lighting at Dublin Array OWF and Arklow Bank OWF Phase 2 (its construction programme overlapping during Year 1 with piling for CWP Project's offshore infrastructure and thereafter operationally) and the operational presence of NISA OWF, the construction lighting of the CWP Project's offshore infrastructure would have a reduced effect on LA 3b due to the greater visibility of Arklow Bank OWF Phase 2 from LA 3b. Works would be temporary in nature and short term in duration. The resultant magnitude of change would be **Negligible** (small in scale, short term and intermediate in terms of geographical extent). The significance of effect would be **Not Significant** (not significant).

717. **TCA 6a Greystones** has been assessed to be of **High–Medium** sensitivity. During construction (night-time), the magnitude of change has been assessed as **Medium–Low** and the resultant effects of the CWP Project ‘alone’ have been assessed to be **Moderate–Slight** (not significant). The cumulative ZTVs indicate that there would be intermittent visibility of NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2 in TCA 6a. During construction (night-time), given a cumulative baseline where the effects of the construction lighting at the CWP Project’s offshore infrastructure is added to the construction lighting at Dublin Array OWF and Arklow Bank OWF Phase 2 (its construction programme overlapping during Year 1 with piling for CWP Project’s offshore infrastructure and thereafter operationally) and the operational presence of NISA OWF, the construction lighting of the CWP Project’s offshore infrastructure would have a similar effect on TCA 6a as CWP Project “alone” effects as it would remain the more prominent OWF. Works would be temporary in nature and short term in duration. The resultant magnitude of change would remain **Medium–Low** (medium–small in scale, short term and intermediate in terms of geographical extent). The significance of effect would be **Moderate–Slight** (not significant).
718. **TCA 6b Kilcoole** has been assessed to be of **High–Medium** sensitivity. During construction (night-time), the magnitude of change has been assessed as **Medium–Low** and the resultant effects of the CWP Project ‘alone’ have been assessed to be **Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of Dublin Array OWF and Arklow Bank OWF Phase 2 in much of TCA 6b and intermittent visibility of NISA OWF. During construction (night-time), given a cumulative baseline where the effects of the construction lighting at the CWP Project’s offshore infrastructure is added to the construction lighting at Dublin Array OWF and Arklow Bank OWF Phase 2 (its construction programme overlapping during Year 1 with piling for CWP Project’s offshore infrastructure and thereafter operationally) and the operational presence of NISA OWF, the construction lighting of the CWP Project’s offshore infrastructure would have a similar effect on TCA 6b as CWP Project “alone” effects as it would remain the more prominent OWF. Works would be temporary in nature and short term in duration. The resultant magnitude of change would remain **Medium–Low** (medium–small in scale, short term and intermediate in terms of geographical extent). The significance of effect would be **Slight** (not significant).
719. **TCA 6c Newcastle** has been assessed to be of **High–Medium** sensitivity. During construction (night-time), the magnitude of change has been assessed as **Medium–Low** and the resultant effects of the CWP Project ‘alone’ have been assessed to be **Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of Dublin Array OWF and Arklow Bank OWF Phase 2 in much of TCA 6c and intermittent visibility of NISA OWF. During construction (night-time), given a cumulative baseline where the effects of the construction lighting at the CWP Project’s offshore infrastructure is added to the construction lighting at Dublin Array OWF and Arklow Bank OWF Phase 2 (its construction programme overlapping during Year 1 with piling for CWP Project’s offshore infrastructure and thereafter operationally) and the operational presence of NISA OWF, the construction lighting of the CWP Project’s offshore infrastructure would have a similar effect on TCA 6c as CWP Project “alone” as it would remain the more prominent OWF. Works would be temporary in nature and short term in duration. The resultant magnitude of change would remain **Medium–Low** (medium–small in scale, short term and intermediate in terms of geographical extent). The significance of effect would be **Slight** (not significant).
720. **TCA 6d Wicklow** has been assessed to be of **High–Medium** sensitivity. During construction (night-time), the magnitude of change has been assessed as **Medium–Low** and the resultant effects of the CWP Project ‘alone’ have been assessed to be **Moderate–Slight** (not significant). The cumulative ZTVs indicate that there would be intermittent visibility of NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2 in TCA 6d. During construction (night-time), given a cumulative baseline where the effects of the construction lighting at the CWP Project’s offshore infrastructure is added to the construction lighting of Dublin Array OWF and Arklow Bank OWF Phase 2 (its construction programme overlapping during Year 1 with piling for CWP Project’s offshore infrastructure) and the operational presence of NISA OWF, the construction lighting of the CWP Project’s offshore infrastructure would

have a similar effect on TCA 6d as CWP Project “alone” effects as it would remain the more prominent OWF. Works would be temporary in nature and short term in duration. The resultant magnitude of change would remain **Medium–Low** (medium–small in scale, short term and intermediate in terms of geographical extent). The significance of effect would be **Moderate–Slight** (not significant).

National designated landscape receptors

721. Bray Head SAA has been assessed in **Chapter 15 Seascape, Landscape & Visual Impact Assessment** as having potential effects of **Slight** significance or above during construction (night-time). The SAA is of **High** sensitivity. During construction (night-time), the magnitude of change has been assessed as **Medium–Low** for both landscape character and visual amenity and the resultant effects of CWP Project ‘alone’ have been assessed to be **Moderate** (not significant). The cumulative ZTVs indicate that there would be intermittent visibility of Dublin Array OWF with some more limited visibility of Arklow Bank OWF Phase 2 and NISA OWF within Bray Head SAA. During construction (night-time), given a cumulative baseline where the effects of the construction lighting at the CWP Project’s offshore infrastructure is added to the construction lighting at Dublin Array OWF, Arklow Bank OWF Phase 2 its construction programme overlapping during Year 1 with piling for CWP Project’s offshore infrastructure and thereafter operationally) and the operational presence of NISA OWF, the construction lighting at the CWP Project’s offshore infrastructure would have a reduced effect on Bray Head SAA due to the closer proximity of Dublin Array OWF. Works would be temporary in nature and short term in duration. The resultant magnitude of change for both landscape character and visual amenity would be **Low–Negligible** (medium–small in scale, short term and intermediate in terms of geographical extent). The significance of effect would be **Not Significant** (not significant).

Visual amenity

Visual receptor groups

722. The following visual receptor groups have been assessed in **Chapter 15 Seascape, Landscape & Visual Impact Assessment** as having potential effects of **Slight** significance or above during construction (night-time):
- Visual Receptor Group 2 Killiney to Bray;
 - Visual Receptor Group 3 Bray Head to Cliff Manor;
 - Visual Receptor Group 4 Cliff Manor, Greystones, Kilcoole to Five Mile Point;
 - Visual Receptor Group 5 Wicklow to Wicklow Head;
 - Visual Receptor Group 6 Dublin and Bray Mountains;
 - Visual Receptor Group 8 Wicklow Head to Brittas Bay; and
 - Visual Receptor Group 9 Marine Recreational Receptors.
723. **Visual Receptor Group 2 Killiney to Bray** has been assessed to be of **High–Medium** sensitivity. During construction (night-time), the magnitude of change has been assessed as **Low** and the resultant effects of the CWP Project ‘alone’ has been assessed to be **Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of Dublin Array OWF and Arklow Bank OWF Phase 2 from parts of this visual receptor group, with Dublin Array OWF located closer to this visual receptor group than the CWP Project. During construction (night-time), given a cumulative baseline where the effects of the construction lighting of the CWP Project’s offshore infrastructure is added to the construction lighting of Dublin Array OWF (its construction programme aligning with CWP Project’s offshore infrastructure) and construction as well as operational lighting for Arklow Bank OWF Phase 22, the lighting of the CWP Project’s offshore infrastructure would have a reduced effect on this visual receptor group due to the closer proximity of Dublin Array OWF. Works would be temporary in nature

and short term in duration. The resultant magnitude of change would be **Low–Negligible** (medium–small in scale, short term and intermediate / wide in terms of geographical extent). The significance of effect would be **Not Significant** (not significant).

724. **Visual Receptor Group 3 Bray Head to Cliff Manor** has been assessed to be of **High** sensitivity. During construction (night-time), the magnitude of change has been assessed as **Medium–Low** and the resultant effects of the CWP Project ‘alone’ have been assessed to be **Moderate** (not significant). The cumulative ZTVs indicate that there would be visibility of Dublin Array OWF, Arklow Bank OWF Phase 2 and NISA OWF from parts of this visual receptor group, with Dublin Array OWF located closer to this visual receptor group than the CWP Project. During construction (night-time), given a cumulative baseline where the effects of the construction lighting of the CWP Project’s offshore infrastructure are added to the construction lighting of Dublin Array OWF (which aligns with CWP Project’s offshore infrastructure construction programme), Arklow Bank OWF Phase 2 (overlapping during construction with Year 1 of CWP’s project’ offshore infrastructure with an operational presence thereafter) plus the operational presence of NISA OWF, the lighting of the CWP Project would have a reduced effect on this visual receptor group due to the closer proximity of Dublin Array OWF. Works would be temporary in nature and short term in duration. The resultant magnitude of change would be **Low–Negligible** (medium–small in scale, short term and intermediate in terms of geographical extent). The significance of effect would be **Not Significant** (not significant).
725. **Visual Receptor Group 4 Cliff Manor, Greystones, Kilcoole to Five Mile Point** is assessed to be of **High–Medium** sensitivity. During construction (night-time), the magnitude of change has been assessed as **Medium** and the resultant effects of the CWP Project ‘alone’ are assessed to be **Moderate** (not significant). The cumulative ZTVs indicate that there would be visibility of NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 21, with Dublin Array OWF located slightly closer to this visual receptor group than CWP. During construction (night-time), given a cumulative baseline where the effects of the construction lighting of the CWP Project’s offshore infrastructure are added to the construction lighting of Dublin Array (which aligns with CWP Project’s offshore infrastructure construction programme), Arklow Bank OWF Phase 2 (overlapping during construction with Year 1 of CWP’s project’ offshore infrastructure with an operational presence thereafter) plus the operational presence of NISA OWF, the construction lighting of the CWP Project would have a slightly reduced effect on this visual receptor group. Works would be temporary in nature and short term in duration. The resultant magnitude of change would be **Medium–Low** (medium–small in scale, short term and intermediate / wide in terms of geographical extent). The significance of effect would be **Moderate–Slight** (not significant).
726. **Visual Receptor Group 5 Wicklow to Wicklow Head** is assessed to be of **High–Medium** sensitivity. During construction (night-time), the magnitude of change has been assessed as **Medium** and the resultant effects of the CWP Project ‘alone’ are assessed to be **Moderate** (not significant). The cumulative ZTVs indicate that the main combined visibility from this visual receptor group would be the lighting at Dublin Array OWF with the lighting at CWP. During construction (night-time), given a cumulative baseline where the effects of the construction lighting of the CWP Project’s offshore infrastructure are added to the construction lighting of Dublin Array (which aligns with CWP Project’s offshore infrastructure construction programme), and Arklow Bank OWF Phase 2 (overlapping during construction with Year 1 of CWP’s project’ offshore infrastructure with an operational presence thereafter), the construction lighting of the CWP Project would not have an increased effect on this visual receptor group. Works would be temporary in nature and short term in duration. The resultant magnitude of change would be **Medium** (medium in scale, short term and intermediate / wide in terms of geographical extent). The significance of effect would be **Moderate** (not significant).
727. **Visual Receptor Group 6 Dublin and Bray Mountains** has been assessed to be of **High–Medium** sensitivity. During construction (night-time), the magnitude of change has been assessed as **Medium–Low** and the resultant effects of the CWP Project ‘alone’ have been assessed to be **Moderate–Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of Dublin Array OWF,

Arklow Bank OWF Phase 2 and NISA OWF from this visual receptor group, which consists of a number of high points in the landscape. During construction (night-time), given a cumulative baseline where the construction lighting of the CWP Project's offshore infrastructure is added to the construction lighting of Dublin Array OWF (which aligns with CWP Project's offshore infrastructure construction programme), Arklow Bank OWF Phase 2 (overlapping during construction with Year 1 of CWP's project' offshore infrastructure with an operational presence thereafter) plus the operational presence of NISA OWF, the construction lighting of the CWP Project would have a slightly reduced effect on this visual receptor group due to the closer proximity of Dublin Array OWF. Works would be temporary in nature and short term in duration. The resultant magnitude of change would be **Low–Negligible** (medium–small in scale, short term and intermediate / localised in terms of geographical extent). The significance of effect would be **Not Significant** (not significant).

728. **Visual Receptor Group 8 Wicklow Head to Brittas Bay** has been assessed to be of **High–Medium** sensitivity. During construction (nighttime), the magnitude of change has been assessed as **Medium–Low** and the resultant effects of the CWP Project 'alone' have been assessed to be **Moderate–Slight** (not significant). The cumulative ZTVs indicate that the main combined visibility from this visual receptor group would be Arklow Bank OWF Phase 2 with the CWP Project. During construction (night-time), given a cumulative baseline where the construction lighting of the CWP Project's offshore infrastructure is added to the construction / operational lighting of Arklow Bank OWF Phase 2, the construction lighting of the CWP Project would have a reduced effect on this visual receptor group due to the closer proximity of Arklow Bank OWF Phase 2. Works would be temporary in nature and short term in duration. The resultant magnitude of change would be **Low–Negligible** (medium–small in scale, short term and intermediate in terms of geographical extent). The significance of effect would be **Not Significant** (not significant).
729. **Visual Receptor Group 9 Marine Recreational Receptors** has been assessed to be of **High–Medium** sensitivity. During construction (night-time), the magnitude of change has been assessed as **Medium** and the resultant effects of CWP Project 'alone' have been assessed to be **Moderate** (not significant). The cumulative ZTVs indicate that, during construction, there would be potential for combined visibility from this visual receptor group with NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2. During construction (night-time), given a cumulative baseline where the construction lighting of the CWP Project's offshore infrastructure is added to the construction lighting of Dublin Array OWF (which aligns with CWP Project's offshore infrastructure construction programme), Arklow Bank OWF Phase 2 (overlapping during construction with Year 1 of CWP's project' offshore infrastructure with an operational presence thereafter) plus the operational presence of NISA OWF, the construction lighting of the CWP Project would not have an increased effect on this visual receptor group. Works would be temporary in nature and short term in duration. The resultant magnitude of change would be **Medium** (medium in scale, short term and intermediate / wide in terms of geographical extent). The significance of effect would be **Moderate** (not significant).

Main (named) settlements

730. The following main (named) settlements have been assessed in **Chapter 15 Seascape, Landscape & Visual Impact Assessment** as having potential effects of **Slight** significance or above during construction (night-time):
- Killiney (covering Shankill to the south);
 - Bray;
 - Greystones;
 - Kilcoole;
 - Wicklow; and
 - Arklow

731. **Killiney** (covering Shankill to the south) has been assessed to be of **High–Medium** sensitivity. During construction (night-time), the magnitude of change has been assessed as **Low** and the resultant effects of the CWP Project ‘alone’ have been assessed to be **Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2 from locations within Killiney, with Dublin Array OWF located slightly closer to this settlement than the CWP Project. During construction (night-time), given a cumulative baseline where the construction lighting of the CWP Project’s offshore infrastructure is added to the construction lighting of Dublin Array OWF which aligns with CWP Project’s offshore infrastructure construction programme), Arklow Bank OWF Phase 2 (for Year 1 of CWP’ Project’s offshore infrastructure and its operational presence thereafter), as well as the operational presence of NISA OWF, the construction lighting of the CWP Project would have a slightly reduced effect in views from the settlement due to the closer proximity of Dublin Array OWF. Works would be temporary in nature and short term in duration. The resultant magnitude of change would be **Medium–Low** (medium–small in scale, short term and intermediate in terms of geographical extent). The significance of effect would be **Moderate–Slight** (not significant).
732. **Bray** has been assessed to be of **High–Medium** sensitivity. During construction (night-time), the magnitude of change has been assessed as **Low** and the resultant effects of the CWP Project ‘alone’ have been assessed to be **Slight** (not significant). The cumulative ZTVs indicate that there is most likely to be visibility of NISA OWF and Dublin Array OWF from locations within Bray, with Dublin Array OWF located slightly closer to this settlement than the CWP Project. During construction (night-time), given a cumulative baseline where the construction lighting of the CWP Project’s offshore infrastructure is added to the construction lighting of Dublin Array OWF and lighting associated with the operational presence of NISA OWF, the construction of the CWP Project would have a slightly reduced effect in views from the settlement. Works would be temporary in nature and short term in duration. The resultant magnitude of change would be **Low** (medium–small in scale, short term and intermediate / localised in terms of geographical extent). The significance of effect would be **Slight** (not significant).
733. **Greystones** has been assessed to be of **High–Medium** sensitivity. During construction (night-time), the magnitude of change has been assessed as **Medium** and the resultant effects of the CWP Project ‘alone’ have been assessed to be **Moderate** (not significant). The cumulative ZTVs indicate that there is mostly likely to be visibility of lighting at NISA OWF and Dublin Array OWF from locations within Greystones, with Dublin Array OWF located slightly closer to this settlement than the CWP Project. During construction (night-time), given a cumulative baseline where the construction lighting of the CWP Project’s offshore infrastructure is added to the construction lighting of Dublin Array OWF (which aligns with CWP Project’s offshore infrastructure construction programme) and operational lighting associated with NISA OWF, the construction of the CWP Project’s offshore infrastructure would have a slightly reduced effect in views from the settlement. Works would be temporary in nature and short term in duration. The resultant magnitude of change would be **Medium–Low** (medium–small in scale, short term and wide / intermediate in terms of geographical extent). The significance of effect would be **Moderate–Slight** (not significant).
734. **Kilcoole** has been assessed to be of **High–Medium** sensitivity. During construction (night-time), the magnitude of change has been assessed as **Medium** and the resultant effects of the CWP Project ‘alone’ have been assessed to be **Moderate** (not significant). The cumulative ZTVs indicate that there would be visibility of NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2 from locations within Kilcoole. The construction lighting of the CWP Project’s offshore infrastructure would be further from the viewpoint than the construction lighting of Dublin Array OWF (which aligns with CWP Project’s offshore infrastructure construction programme) with the operational presence of NISA OWF in the distance. Works would be temporary in nature and short term in duration. The resultant magnitude of change would be **Medium** (medium in scale, short term and wide in terms of geographical extent). The significance of effect would be **Moderate** (not significant).

735. **Wicklow** has been assessed to be of **High–Medium** sensitivity. During construction (night-time), the magnitude of change has been assessed as **Medium** and the resultant effects of the CWP Project ‘alone’ have been assessed to be **Moderate** (not significant). The cumulative ZTVs indicate that there would be visibility of the lighting of NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2 from locations within Wicklow. The construction lighting of the CWP Project’s offshore infrastructure would be closer to the viewpoint than construction of Dublin Array OWF with the operational presence of NISA OWF in the distance. Works would be temporary in nature and short term in duration. The resultant magnitude of change would be **Medium** (medium in scale, short term and wide in terms of geographical extent). The significance of effect would be **Moderate** (not significant).
736. **Arklow** is assessed to be of **High–Medium** sensitivity. During construction (night-time), the magnitude of change has been assessed as **Low**, resultant effects of CWP offshore ‘alone’ are assessed to be **Slight** (not significant). The cumulative ZTVs indicate that the main visibility would be of Arklow Bank OWF Phase 2 (for Year 1 of CWP’ Project’s offshore infrastructure and its operational presence thereafter), from locations within Arklow, around the operational Arklow Bank OWF Phase 1 and extending slightly in front of the construction of CWP offshore. Works would be temporary in nature and short term in duration. The resultant magnitude of change would be **Low–Negligible** (medium–small in scale, short term and localised in terms of geographical extent). The significance of effect would be **Not Significant** (not significant).

Key routes

737. The following key routes have been assessed in **Chapter 15 Seascape, Landscape & Visual Impact Assessment** as having potential effects of **Slight** significance or above during construction (night-time):
- R119 Road;
 - R750 Road;
 - DART Line (Dublin to Greystones / Dublin to Rosslare Main Line (Greystones to Wicklow)
 - Southern Sea approach to Dublin Port (Dublin to Cherbourg);
 - Bray–Greystone Coastal Walk;
 - Greystone to Wicklow Trail; and
 - The Wicklow Way.
738. **R119 Road** has been assessed to be of **Medium** sensitivity. During construction (night-time), the magnitude of change has been assessed as **Medium–Low** and the resultant effects of the CWP Project ‘alone’ have been assessed to be **Slight** (not significant) for section b (Dalkey / Sorrento Point to Shankill / Ballybrack (Seaford Road)). The cumulative ZTVs indicate that there would be intermittent visibility of NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2 from locations along section b of the R119, with the construction lighting of Dublin Array OWF located closer to the road than construction lighting of the CWP Project’s offshore infrastructure. Works would be temporary in nature and short term in duration. The resultant magnitude of change would be **Low–Negligible** (medium–small in scale, short term and intermediate in terms of geographical extent). The significance of effect would be **Not Significant** (not significant).
739. **R750 Road** has been assessed to be of **High–Medium** sensitivity. During construction (night-time), the magnitude of change has been assessed as **Medium–Low** and the resultant effects of the CWP Project ‘alone’ have been assessed as **Moderate–Slight** (not significant) section b (Brittas to Mizen Head) and section d (Ennereilly (just south of Sallymount) to Aisling / Seabank). The cumulative ZTVs indicate that there would be visibility of Arklow Bank OWF Phase 2 from locations along sections b and d of the R750 and occasional visibility of Dublin Array OWF, with Arklow Bank OWF Phase 2 located closer to the road than construction of the CWP Project’s offshore infrastructure. During construction (night-time), given a cumulative baseline where the lighting of the construction of the CWP

Project's offshore infrastructure are added to the construction lighting of Dublin Array OWF and Arklow Bank OWF Phase 2 (for Year 1 of CWP' Project's offshore infrastructure and its operational presence thereafter), the construction lighting of the CWP Project would have a reduced effect on users of this road due to the closer proximity of Arklow Bank OWF Phase 2. Works would be temporary in nature and short term in duration. The resultant magnitude of change for both sections b and d would be **Negligible** (small in scale, short term and intermediate in terms of geographical extent). The significance of effect would be **Not Significant** (not significant).

740. **DART Line (Dublin to Greystones / Dublin to Rosslare Main Line (Greystones to Wicklow)** has been assessed to be of **Medium** sensitivity. During construction (night-time), the magnitude of change has been assessed as **Medium-Low** and the resultant effects of the CWP Project 'alone' have been assessed as **Slight** (not significant) overall, with a **Slight** (not significant) for section c (Dalkey / Sorrento Point to Bray) and **Moderate** (not significant) for section d (Bray Head to Wicklow). The cumulative ZTVs indicate that there would be intermittent visibility of NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2 from locations along the length of the railway line. At various points along the route, the construction lighting of Dublin Array OWF construction / operational lighting of Arklow Bank OWF Phase 2 would be located closer to the railway line than construction lighting of the CWP Project. During construction (night-time), given a cumulative baseline where the construction lighting of the CWP Project's offshore infrastructure is added to the construction lighting of Dublin Array OWF and Arklow Bank OWF Phase 2 (for Year 1 of CWP' Project's offshore infrastructure and its operational presence thereafter) and the operational phase of NISA OWF, the construction of the CWP Project's offshore infrastructure would have a reduced effect on the DART line due to the closer proximity of Dublin Array OWF or Arklow Bank OWF Phase 2. Works would be temporary in nature and short term in duration. The resultant magnitude of change for both section c and the overall route would be **Low-Negligible** (medium-small in scale, short term and intermediate in terms of geographical extent). The significance of effect would be **Not Significant** (not significant). The resultant magnitude of change for section d would remain **Medium** (large in scale, short term and intermediate in terms of geographical extent). The significance of effect would be **Moderate** (not significant).
741. **Southern Approach to approach to be Dublin Port** (Dublin to Cherbourg) has been assessed to be of **Medium** sensitivity. During construction (night-time), the magnitude of change has been assessed as **Medium-Low** and the resultant effects of the CWP Project 'alone' have been assessed as **Slight** (not significant) overall with variations for sections of the route for section a (0–10 km) and section b (10–20 km from the outer edge of the array) of **Moderate / Moderate-Slight** (section a) or **Slight** (section b). The cumulative ZTVs indicate that there would be visibility of Dublin Array OWF and Arklow Bank OWF Phase 2 from this ferry route, with NISA OWF likely to be visible north of CWP offshore. At various points along the route, the construction lighting of Dublin Array OWF or construction / operational lighting associated with Arklow Bank OWF Phase 2 would be located closer to the ferry route than construction lighting of the CWP Project. During construction (night-time), given a cumulative baseline where the effects of the construction of the CWP Project's offshore infrastructure are added to those resulting from the construction of Dublin Array OWF and Arklow Bank OWF Phase 2 (for Year 1 of CWP' Project's offshore infrastructure and its operational presence thereafter) and the operational phase of NISA OWF, the construction of the CWP Project's offshore infrastructure would have a reduced effect on the southern approach to Dublin Port due to the closer proximity of Dublin Array OWF or Arklow Bank OWF Phase 2. Works would be temporary in nature and short term in duration. The resultant magnitude of change for both section b, where the construction lighting of Arklow Bank OWF Phase 2 would be closer to the ferry route, and the overall route would be **Negligible** (small in scale, short term and localised in terms of geographical extent). The significance of effect would be **Not Significant** (not significant). The resultant magnitude of change for section a would remain **Medium** (medium in scale, short term and wide in terms of geographical extent). The significance of effect would be **Moderate / Moderate-Slight** (not significant).

742. **Bray–Greystones Cliff Walk** has been assessed to be of **High–Medium** sensitivity. During construction (night-time), the magnitude of change has been assessed as **Medium–Low** and the resultant effects of the CWP Project ‘alone’ have been assessed as **Moderate–Slight** (not significant) overall with a **Moderate–Slight** (not significant) effect for section a (Bray to Cliff Manor (northern section of the route)) and **Moderate** (not significant effect) for section b (Cliff Manor to Greystones (central and south section of the route)). The cumulative ZTVs indicate that there would be visibility of NISA OWF and Dublin Array OWF from the Cliff Walk, with intermittent visibility of Arklow Bank OWF Phase 2. During construction (night-time), given a cumulative baseline where the lighting of the construction of the CWP Project’s offshore infrastructure is added to the lighting of the construction of Dublin Array OWF and Arklow Bank OWF Phase 2 (for Year 1 of CWP’ Project’s offshore infrastructure and its operational presence thereafter) as well as the operational presence of NISA OWF, the construction of the CWP Project’s offshore infrastructure would have a reduced effect on the Bray–Greystones Cliff Walk due to the closer proximity of Dublin Array OWF. Works would be temporary in nature and short term in duration. The resultant magnitude of change for the overall route and sections a and b would be **Negligible** (small in scale, short term and wide / intermediate in terms of geographical extent). The significance of effect would be **Not Significant** (not significant).
743. **Greystones to Wicklow Trail** has been assessed to be of **High–Medium** sensitivity. During construction (night-time), the magnitude of change has been assessed as **Medium–Low** and the resultant effects of the CWP Project ‘alone’ have been assessed as **Moderate–Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2 from most of the Trail. During construction (night-time), given a cumulative baseline where the lighting of the construction of the CWP Project’s offshore infrastructure is added to the construction lighting of Dublin Array OWF and Arklow Bank OWF Phase 2 (for Year 1 of CWP’ Project’s offshore infrastructure and its operational presence thereafter) as well as the operational presence of NISA OWF, the construction of the CWP Project’s offshore infrastructure would have a reduced effect on the Greystones to Wicklow Trail due to the closer proximity of Dublin Array OWF. Works would be temporary in nature and short term in duration. The resultant magnitude of change for the route would remain **Medium–Low** (medium in scale, short term and wide / intermediate in terms of geographical extent). The significance of effect would be **Moderate–Slight** (not significant).
744. **The Wicklow Way** has been assessed to be of **High–Medium** sensitivity. During construction (night-time), the magnitude of change has been assessed as **Low** and the resultant effects of the CWP Project ‘alone’ have been assessed as **Slight** (not significant) for section c from Ride Rock to White Hill on the eastern slopes of Djouce Mountain and section d: Ballinastoe Woods through to Laragh East. The cumulative ZTVs indicate that there would be intermittent visibility of NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2 from locations along the length of the Wicklow Way. During construction (night-time), given a cumulative baseline where the effects of the construction lighting of the CWP Project’s offshore infrastructure is added to the construction lighting of Dublin Array OWF and Arklow Bank OWF Phase 2 (for Year 1 of CWP’ Project’s offshore infrastructure and its operational presence thereafter) as well as the operational presence of NISA OWF, the construction of the CWP Project’s offshore infrastructure would appear to be visually separate. The resultant magnitude of change for sections c and d would remain **Low** (medium in scale, short term and intermediate / localised in terms of geographical extent). The significance of effect would be **Slight** (not significant).
745. The SLVIA assessors judged that the CWP Project’s offshore infrastructure ‘alone’ would have no significant adverse cumulative effects during construction (nighttime).

13.5.2 Operation and maintenance phase

Cumulative Impact 3: Direct / indirect long term though reversible impacts on seascape / landscape and townscapes / national designated landscapes and visual receptors.

Seascape receptors

746. The following Regional Seascape Receptors have been assessed in **Chapter 15 Seascape, Landscape & Visual Impact Assessment** as having potential effects of **Slight** significance or above during operation:
- RSCA 13 South Irish Sea;
 - RSCA 14 Irish Sea, Sandbank and Broad Bays;
 - RSCA 15 Dublin Bay; and
 - RSCA 16 North Eastern Irish Sea Islands and Beaches.
747. **RSCA 13 South Irish Sea** has been assessed to be of **Medium** sensitivity. During operation, the magnitude of change has been assessed as **Medium** and the resultant effects of the CWP Project 'alone' have been assessed to be **Moderate** (not significant). The operational Arklow Bank OWF Phase 1 is located within this RSCA. Arklow Bank OWF Phase 2 would be located within this RSCA, with Dublin Array OWF located approximately 22.5 km north of the RSCA and NISA OWF approximately 70.2 km north. During operation, given a cumulative baseline where the effects of the CWP Project's offshore infrastructure are added to Arklow Bank OWF Phase 2, Dublin Array OWF and NISA OWF, the CWP Project would have a reduced effect on this RSCA. The resultant magnitude of change would be **Medium-Low** (medium-small in scale, long term and localised in terms of geographical extent). The significance of the effect would be **Slight** (not significant).
748. **RSCA 14 Irish Sea, Sandbank and Broad Bays** has been assessed to be of **Medium** sensitivity. During operation, the magnitude of change has been assessed as **High** and the resultant effects of CWP Project 'alone' have been assessed to be **Significant** (significant). Dublin Array OWF would be partly located within this RSCA, with NISA OWF approximately 41.4 km north of the RSCA and Arklow Bank OWF Phase 2 located approximately 4.1 km south. During operation, given a cumulative baseline where the effects of the CWP Project's offshore infrastructure are added to Dublin Array OWF, NISA OWF and Arklow Bank OWF Phase 2, the CWP Project would have a reduced effect on this RSCA as Dublin Array OWF would already be affecting the RSCA. The resultant magnitude of change would be **High-Medium** (large-medium in scale, long term and intermediate in terms of geographical extent). The significance of effect would be **Moderate** (not significant).
749. **RSCA 15 Dublin Bay** has been assessed to be of **High-Medium** sensitivity. During operation, the magnitude of change has been assessed as **Low** and the resultant effects of the CWP Project 'alone' have been assessed to be **Slight** (not significant). Dublin Array OWF would be partly located within this RSCA, with NISA OWF approximately 22.5 km north of the RSCA and Arklow Bank OWF Phase 2 located approximately 37.5 km south. During operation, given a cumulative baseline where the effects of the CWP Project's offshore infrastructure are added to Dublin Array OWF, NISA OWF and Arklow Bank OWF Phase 2, the CWP Project would have a reduced effect on this RSCA as Dublin Array OWF would already be affecting the RSCA. The resultant magnitude of change would be **Low-Negligible** (small-negligible in scale, long term and localised in terms of geographical extent). The significance of effect would be **Not Significant** (not significant).
750. **RSCA 16 North Eastern Irish Sea Islands and Beaches** has been assessed to be of **Medium** sensitivity. During operation, the magnitude of change has been assessed as **Low** and the resultant effects of the CWP Project 'alone' have been assessed to be **Slight** (not significant). Dublin Array OWF would be located between CWP's array site and this RSCA, with NISA OWF located to the north.

During operation, given a cumulative baseline where the effects of the CWP Project's offshore infrastructure are added to Dublin Array OWF and NISA OWF, the CWP Project would have a reduced effect on this RSCA due to the closer proximity of Dublin Array OWF. The resultant magnitude of change would be **Low–Negligible** (small–negligible in scale, long term and localised in terms of geographical extent). The significance of effect would be **Not Significant** (not significant).

Landscape / townscape character receptors

751. The following Landscape / Townscape Character Areas have been assessed in **Chapter 15 Seascape, Landscape & Visual Impact Assessment** as having potential effects of **Slight** significance or above during operation:

- Fingal County Council Landscape Character Types and Areas
 - LCA 1d Howth LCA;
 - LCA 1e Ireland's Eye LCA; and
 - LCA 1f Lambay Island.
- Dublin City Council Townscape Character Areas
 - TCA 6 North Bull Island;
 - TCA 8 Sandymount; and
 - TCA 10 St Annes Park.
- Dun Laoghaire–Rathdown County Council Landscape and Townscape Character Areas
 - LCA 5 Kiltiernan Plain LCA;
 - LCA 6 Ballycorus LCA;
 - LCA 7 Glencullen Valley LCA;
 - LCA 8 Glendoo Valley LCA;
 - LCA 10 Rathmichael LCA;
 - LCA 11. Ballyman LCA;
 - LCA 12 Shanganagh LCA;
 - TCA 2 Dun Laoghaire / Monkstown
 - TCA 4 Dalkey;
 - TCA 5 Dalkey Island;
 - TCA 6 Killiney Bay; and
 - TCA 7 Shankill.
- Wicklow County Council Landscape Areas and Townscape Character Areas
 - LA 1a. The Mountain Uplands (AONB);
 - LA 1c. The Bray Mountains Group;
 - LA 1d. The North Eastern Valley;
 - LA 2a. Northern Coastal Area;
 - LA 2b. Southern Coastal Area;
 - LA 3a. North East Mountain Lowlands;
 - LA 3b. South East Mountain Lowlands;
 - LA 3c. Southern Hills;
 - LA 4a. N11;
 - LA 5 Rolling Lowlands Areas 1-6;
 - TCA 6a Greystones;
 - TCA 6b Kilcoole;
 - TCA 6c Newcastle; and
 - TCA 6d Wicklow.
- Wexford County Council Landscape Character Units

- LCU 1. Uplands;
- LCU 2. Lowlands;
- LCU 4. Coastal;
- LCU 5. Distinctive - 5A Kilmichael Point; and
- LCU 5. Distinctive - 5b Ask Hill, 5c Tara Hill, 5d Ballyminaun.

Fingal County Council Landscape Character Types and Areas

752. **LCA 1d Howth** has been assessed to be of **High** sensitivity. During operation, the magnitude of change has been assessed as **Low** and the resultant effects of the CWP Project 'alone' have been assessed to be **Moderate–Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2 from parts of LCA 1d, with Dublin Array OWF located closer to LCA 1d than the CWP Project. During operation, given a cumulative baseline where the effects of the CWP Project's offshore infrastructure are added to NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, the CWP Project would have a slightly reduced effect on LCA 1d due to the closer proximity of Dublin Array OWF. The resultant magnitude of change would be **Low–Negligible** (small–negligible in scale, long term and intermediate / localised in terms of geographical extent). The significance of effect would be **Not Significant** (not significant).
753. **LCA 1e Ireland's Eye** has been assessed to be of **High** sensitivity. During operation, the magnitude of change has been assessed as **Low** and the resultant effects of the CWP Project 'alone' have been assessed to be **Moderate–Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2 from most of LCA 1e, with Dublin Array OWF located closer to LCA 1e than the CWP Project. During operation, given a cumulative baseline where the effects of the CWP Project's offshore infrastructure are added to NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, the CWP Project would have a slightly reduced effect on LCA 1e due to the closer proximity of Dublin Array OWF. The resultant magnitude of change would be **Low–Negligible** (small–negligible in scale, long term and intermediate / localised in terms of geographical extent). The significance of effect would be **Not Significant** (not significant).
754. **LCA 1f Lambay Island** has been assessed to be of **High–Medium** sensitivity. During operation, the magnitude of change has been assessed as **Low** and the resultant effects of the CWP Project 'alone' have been assessed to be **Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2 from most of LCA 1f, with Dublin Array OWF located closer to LCA 1f than the CWP Project. During operation, given a cumulative baseline where the effects of the CWP Project's offshore infrastructure are added to NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, the CWP Project would have a slightly reduced effect on LCA 1f due to the closer proximity of Dublin Array OWF. The resultant magnitude of change would be **Low–Negligible** (small–negligible in scale, long term and intermediate / localised in terms of geographical extent). The significance of effect would be **Not Significant** (not significant).

Dublin City Council Townscape Character Areas

755. **TCA 6 North Bull Island** has been assessed to be of **High** sensitivity. During operation, the magnitude of change has been assessed as **Low** and the resultant effects of the CWP Project 'alone' have been assessed to be **Moderate–Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of NISA OWF and Dublin Array OWF from much of TCA 6, with Dublin Array OWF located closer to TCA 6 than the CWP Project. During operation, given a cumulative baseline where the effects of the CWP Project's offshore infrastructure are added to NISA OWF and Dublin Array OWF, the CWP Project would have a slightly reduced effect on TCA 6 due to the closer proximity of Dublin Array OWF. The resultant magnitude of change would be **Low–Negligible** (small–negligible in scale, long term and intermediate in terms of geographical extent). The significance of effect would be **Not Significant** (not significant).
756. **TCA 8 Sandymount** has been assessed to be of **High–Medium** sensitivity. During operation, the magnitude of change has been assessed as **Low** and the resultant effects of the CWP Project 'alone'

have been assessed to be **Slight** (not significant). The cumulative ZTVs indicate that there would be localised visibility of NISA OWF and Dublin Array OWF from the eastern edge of this TCA, with Dublin Array OWF located closer to TCA 10 than the CWP Project. During operation, given a cumulative baseline where the effects of the CWP Project's offshore infrastructure are added to NISA OWF and Dublin Array OWF, the CWP Project would have a slightly reduced effect on TCA 8 due to the closer proximity of Dublin Array OWF. The resultant magnitude of change would be **Low–Negligible** (medium–small in scale, long term and limited in terms of geographical extent). The significance of effect would be **Not Significant** (not significant).

757. **TCA 10 St Annes Park** has been assessed to be of **High–Medium** sensitivity. During operation, the magnitude of change has been assessed as **Low** and the resultant effects of the CWP Project 'alone' have been assessed to be **Slight** (not significant). The cumulative ZTVs indicate that there would be intermittent visibility of NISA OWF and Dublin Array OWF from parts of TCA 10, with Dublin Array OWF located closer to TCA 10 than the CWP Project. During operation, given a cumulative baseline where the effects of the CWP Project's offshore infrastructure are added to NISA OWF and Dublin Array OWF, the CWP Project would have a slightly reduced effect on TCA 10 due to the closer proximity of Dublin Array OWF. The resultant magnitude of change would be **Low–Negligible** (small–negligible in scale, long term and localised in terms of geographical extent). The significance of effect would be **Not Significant** (not significant).

Dun Laoghaire–Rathdown County Council Landscape and Townscape Character Areas

758. **LCA 5 Kiltiernan Plain** has been assessed to be of **High–Medium** sensitivity. During operation, the magnitude of change has been assessed as **Low** and the resultant effects of the CWP Project 'alone' have been assessed to be **Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of NISA OWF and Dublin Array OWF throughout much of LCA 5. During operation, given a cumulative baseline where the effects of the CWP Project's offshore infrastructure are added to NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, the CWP Project would have a reduced effect on LCA 5 due to the closer proximity of Dublin Array OWF. The resultant magnitude of change would be **Low–Negligible** (small–negligible in scale, long term and intermediate / localised in terms of geographical extent). The significance of effect would be **Not Significant** (not significant).
759. **LCA 6 Ballycorus** has been assessed to be of **Medium** sensitivity. During operation, the magnitude of change has been assessed as **Low** and the resultant effects of the CWP Project 'alone' have been assessed to be **Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of, NISA OWF and Dublin Array OWF throughout parts of LCA 6. During operation, given a cumulative baseline where the effects of the CWP Project's offshore infrastructure are added to NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, the CWP Project would have a reduced effect on LCA 6 due to the closer proximity of Dublin Array OWF. The resultant magnitude of change would be **Low–Negligible** (Small–negligible in scale, long-term and intermediate / localised in terms of geographical extent). The significance of effect would be **Not Significant** (not significant).
760. **LCA 7 Glencullen Valley** has been assessed to be of **High–Medium** sensitivity. During operation, the magnitude of change has been assessed as **Low** and the resultant effects of the CWP Project 'alone' have been assessed to be **Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of Dublin Array OWF throughout much of LCA 7, with more intermittent visibility of NISA OWF and Arklow Bank OWF Phase 2. During operation, given a cumulative baseline where the effects of the CWP Project's offshore infrastructure are added to NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, the CWP Project would have a reduced effect on LCA 7 due to the closer proximity of Dublin Array OWF. The resultant magnitude of change would be **Low–Negligible** (small–negligible in scale, long term and intermediate in terms of geographical extent). The significance of effect would be **Not Significant** (not significant).
761. **LCA 8 Glendoo Valley** has been assessed to be of **High–Medium** sensitivity. During operation, the magnitude of change has been assessed as **Low** and the resultant effects of the CWP Project 'alone'

have been assessed to be **Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of Dublin Array OWF throughout much of LCA 8, with more intermittent visibility of NISA OWF and Arklow Bank OWF Phase 2. During operation, given a cumulative baseline where the effects of the CWP Project's offshore infrastructure are added to NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, the CWP Project would have a reduced effect on LCA 8 due to the closer proximity of Dublin Array OWF. The resultant magnitude of change would be **Low–Negligible** (small–negligible in scale, long-term and intermediate in terms of geographical extent). The significance of effect would be **Not Significant** (not significant).

762. **LCA 10 Rathmichael** has been assessed to be of **Medium** sensitivity. During operation, the magnitude of change has been assessed as **Medium** and the resultant effects of the CWP Project 'alone' have been assessed to be **Moderate** (not significant). The cumulative ZTVs indicate that there would be visibility of NISA OWF and Dublin Array OWF throughout much of LCA 10. During operation, given a cumulative baseline where the effects of the CWP Project's offshore infrastructure are added to NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, the CWP Project would have a reduced effect on LCA 10 due to the closer proximity of Dublin Array OWF. The resultant magnitude of change would be **Medium–Low** (medium–small in scale, long-term and wide / intermediate in terms of geographical extent). The significance of effect would be **Slight** (not significant).
763. **LCA 11 Ballyman** has been assessed to be of **Medium** sensitivity. During operation, the magnitude of change has been assessed as **Medium** and the resultant effects of the CWP Project 'alone' have been assessed to be **Moderate** (not significant). The cumulative ZTVs indicate that there would be visibility of Dublin Array OWF throughout much of LCA 11, with more intermittent visibility of NISA OWF. During operation, given a cumulative baseline where the effects of the CWP Project's offshore infrastructure are added to NISA OWF and Dublin Array OWF, the CWP Project would have a reduced effect on LCA 11 due to the closer proximity of Dublin Array OWF. The resultant magnitude of change would be **Medium–Low** (medium–small in scale, long term and intermediate in terms of geographical extent). The significance of effect would be **Slight** (not significant).
764. **LCA 12. Shanganagh** has been assessed to be of **Medium** sensitivity. During operation, the magnitude of change has been assessed as **Medium** and the resultant effects of the CWP Project 'alone' have been assessed to be **Moderate** (not significant). The cumulative ZTVs indicate that there would be visibility of Dublin Array OWF throughout much of LCA 12, with more intermittent visibility of NISA OWF. During operation, given a cumulative baseline where the effects of the CWP Project's offshore infrastructure are added to NISA OWF and Dublin Array OWF, the CWP Project would have a reduced effect on LCA 12 due to the closer proximity of Dublin Array OWF. The resultant magnitude of change would be **Medium–Low** (medium–small in scale, long term and wide in terms of geographical extent). The significance of effect would be **Moderate–Slight** (not significant).
765. **TCA 2 Dun Laoghaire / Monkstown** has been assessed to be of **High–Medium** sensitivity. During operation, the magnitude of change has been assessed as **Low** and the resultant effects of the CWP Project 'alone' have been assessed to be **Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of NISA OWF and Dublin Array OWF for much of TCA 2. During operation, given a cumulative baseline where the effects of the CWP Project's offshore infrastructure are added to NISA OWF and Dublin Array OWF, the CWP Project would have a reduced effect on TCA 2 due to the closer proximity of Dublin Array OWF. The resultant magnitude of change would be **Low–Negligible** (medium–small in scale, long term and limited in terms of geographical extent). The significance of effect would be **Not Significant** (not significant).
766. **TCA 4 Dalkey** has been assessed to be of **High–Medium** sensitivity. During operation, the magnitude of change has been assessed as **Low** and the resultant effects of the CWP Project 'alone' have been assessed to be **Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of NISA OWF and Dublin Array OWF in parts of TCA 4. During operation, given a cumulative baseline where the effects of the CWP Project's offshore infrastructure are added to NISA OWF and Dublin Array OWF, the CWP Project would have a reduced effect on TCA 4 due to the closer proximity of

Dublin Array OWF. The resultant magnitude of change would be **Low–Negligible** (medium–small in scale, long term and limited in terms of geographical extent). The significance of effect would be **Not Significant** (not significant).

767. **TCA 5 Dalkey Island** has been assessed to be of **High–Medium** sensitivity. During operation, the magnitude of change has been assessed as **Medium** and the resultant effects of the CWP Project ‘alone’ have been assessed to be **Moderate** (not significant). The cumulative ZTVs indicate that there would be visibility of NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2 in much of TCA 5. During operation, given a cumulative baseline where the effects of the CWP Project’s offshore infrastructure are added to NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, the CWP Project would have a reduced effect on TCA 5 due to the closer proximity of Dublin Array OWF. The resultant magnitude of change would be **Medium–Low** (medium–small in scale, long term and wide in terms of geographical extent). The significance of effect would be **Moderate** (not significant).
768. The SLVIA assessors judged that the CWP Project’s offshore infrastructure ‘alone’ would have no significant effects. The CEA assessors judged that Dublin Array OWF would be prominent in views from this TCA, introducing new vertical features into an undeveloped seascape.
769. **TCA 6 Killiney Bay** has been assessed to be of **High–Medium** sensitivity. During operation, the magnitude of change has been assessed as **Medium** and the resultant effects of the CWP Project ‘alone’ have been assessed to be **Moderate** (not significant). The cumulative ZTVs indicate that there would be visibility of Dublin Array OWF and Arklow Bank OWF Phase 2 in limited areas of TCA 6. During operation, given a cumulative baseline where the effects of the CWP Project’s offshore infrastructure are added to Dublin Array OWF and Arklow Bank OWF Phase 2, the CWP Project would have a reduced effect on TCA 6 due to the closer proximity of Dublin Array OWF. The resultant magnitude of change would be **Medium–Low** (medium–small in scale, long term and localised in terms of geographical extent). The significance of effect would be **Moderate** (not significant).
770. **TCA 7 Shankill** has been assessed to be of **Medium** sensitivity. During operation, the magnitude of change has been assessed as **Medium** and the resultant effects of the CWP Project ‘alone’ have been assessed to be **Moderate** (not significant). The cumulative ZTVs indicate that there would be visibility of NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2 in limited areas of TCA 7. During operation, given a cumulative baseline where the effects of the CWP Project’s offshore infrastructure are added to NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, the CWP Project would have a reduced effect on TCA 7 due to the closer proximity of Dublin Array OWF. The resultant magnitude of change would be **Medium–Low** (medium–small in scale, long term and localised in terms of geographical extent). The significance of effect would be **Slight** (not significant).

Wicklow County Council Landscape Areas and Townscape Character Areas

771. **LA 1a. The Mountain Uplands (AONB)** has been assessed to be of **High–Medium** sensitivity. During operation, the magnitude of change has been assessed as **Medium–Low** and the resultant effects of the CWP Project ‘alone’ have been assessed to be **Moderate–Slight** (not significant). The cumulative ZTVs indicate that there would be intermittent visibility of Dublin Array OWF and Arklow Bank OWF Phase 2 in LA 1a, and to a lesser extent NISA OWF. During operation, given a cumulative baseline where the effects of the CWP Project’s offshore infrastructure are added to NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, the CWP Project would remain the most prominent OWF. The resultant magnitude of change would remain **Medium–Low** (medium–small in scale, long term and localised in terms of geographical extent). The significance of effect would be **Moderate–Slight** (not significant).
772. **LA 1c. The Bray Mountains Group** has been assessed to be of **High–Medium** sensitivity. During operation, the magnitude of change has been assessed as **High–Medium** and the resultant effects of the CWP Project ‘alone’ have been assessed to be **Significant** (significant). The cumulative ZTVs indicate that there would be intermittent visibility of Dublin Array OWF with some more limited visibility of Arklow Bank OWF Phase 2 and NISA OWF within LA 1c. During operation, given a cumulative

baseline where the effects of the CWP Project's offshore infrastructure are added to Dublin Array OWF, Arklow Bank OWF Phase 2 and NISA OWF, the CWP Project would have a reduced effect on LA 1c due to the closer proximity of Dublin Array OWF. The resultant magnitude of change would be **Medium** (medium in scale, long term and intermediate in terms of geographical extent). The significance of effect would be **Moderate-Slight** (not significant).

773. **LA 1d. The North Eastern Valley** has been assessed to be of **High-Medium** sensitivity. During operation, the magnitude of change has been assessed as **Medium** and the resultant effects of the CWP Project 'alone' have been assessed to be **Moderate** (not significant). The cumulative ZTVs indicate that there would be visibility of Dublin Array OWF in parts of LA 1d and intermittent visibility of NISA OWF and Arklow Bank OWF Phase 2. During operation, given a cumulative baseline where the effects of the CWP Project's offshore infrastructure are added to NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, the CWP Project would have a reduced effect on LA 1d due to the closer proximity of Dublin Array OWF. The resultant magnitude of change would be **Medium-Low** (medium-small in scale, long term and intermediate in terms of geographical extent). The significance of effect would be **Moderate-Slight** (not significant).
774. **LA 2a. Northern Coastal Area** has been assessed to be of **High-Medium** sensitivity. During operation, the magnitude of change has been assessed as **High-Medium** and the resultant effects of the CWP Project 'alone' have been assessed to be **Significant** (significant). The cumulative ZTVs indicate that there would be visibility of Dublin Array OWF and Arklow Bank OWF Phase 2 in much of LA 2a and intermittent visibility of NISA OWF. During operation, given a cumulative baseline where the effects of the CWP Project's offshore infrastructure are added to NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, the CWP Project would have a similar effect on LA 2a due to the other OWFs appearing in different parts of views from LA 2a. The resultant magnitude of change would remain **Medium** (large-medium in scale, long term and intermediate in terms of geographical extent). The significance of effect would be **Significant** (significant).
775. **LA 2b. Southern Coastal Area** has been assessed to be of **High-Medium** sensitivity. During operation, the magnitude of change has been assessed as **High-Medium** and the resultant effects of the CWP Project 'alone' have been assessed to be **Significant** (significant). The cumulative ZTVs indicate that there would be visibility of Arklow Bank OWF Phase 2 in much of LA 2b and intermittent visibility of Dublin Array OWF. During operation, given a cumulative baseline where the effects of the CWP Project's offshore infrastructure are added to Dublin Array OWF and Arklow Bank OWF Phase 2, the CWP Project would have a reduced effect on LA 2b due to the visibility of Arklow Bank OWF Phase 2 from LA 2b. The resultant magnitude of change would be **Medium** (medium in scale, long term and intermediate in terms of geographical extent). The significance of effect would be **Moderate** (not significant).
776. **LA 3a. North East Mountain Lowlands** has been assessed to be of **High-Medium** sensitivity. During operation, the magnitude of change has been assessed as **Medium** and the resultant effects of the CWP Project 'alone' have been assessed to be **Moderate** (not significant). The cumulative ZTVs indicate that there would be intermittent visibility of NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2 in LA 3a. During operation, given a cumulative baseline where the effects of the CWP Project's offshore infrastructure are added to NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, the CWP Project would have a similar effect on LA 3a due to the visual separation between the OWFs in from LA 3a. The resultant magnitude of change would remain **Medium** (medium in scale, long term and intermediate in terms of geographical extent). The significance of effect would be **Moderate** (not significant).
777. **LA 3b. South East Mountain Lowlands** has been assessed to be of **High-Medium** sensitivity. During operation, the magnitude of change has been assessed as **Medium** and the resultant effects of the CWP Project 'alone' have been assessed to be **Moderate** (not significant). The cumulative ZTVs indicate that there would be intermittent visibility of Dublin Array OWF and Arklow Bank OWF Phase 2, and to a lesser extent NISA OWF in LA 3b. During operation, given a cumulative baseline where

the effects of the CWP Project's offshore infrastructure are added to NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, the CWP Project would have a reduced effect on LA 3b due to the greater visibility of Arklow Bank OWF Phase 2 from LA 3b. The resultant magnitude of change would be **Moderate-Low** (medium-small in scale, long term and intermediate in terms of geographical extent). The significance of effect would be **Moderate-Slight** (not significant).

778. **LA 3c. Southern Hills** has been assessed to be of **High-Medium** sensitivity. During operation, the magnitude of change has been assessed as **Medium-Low** and the resultant effects of the CWP Project 'alone' have been assessed to be **Moderate-Slight** (not significant). The cumulative ZTVs indicate that there would be intermittent visibility of Dublin Array OWF and Arklow Bank OWF Phase 2, and to a lesser extent NISA OWF in LA 3c. During operation, given a cumulative baseline where the effects of the CWP Project's offshore infrastructure are added to NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, the CWP Project would have a reduced effect on LA 3c due to the greater visibility of Arklow Bank OWF Phase 2 from LA 3c. The resultant magnitude of change would be **Low** (small in scale, long term and intermediate in terms of geographical extent). The significance of effect would be **Slight** (not significant).
779. **LA 4a. N11** has been assessed to be of **Medium-Low** sensitivity. During operation, the magnitude of change has been assessed as **Medium-Low** and the resultant effects of the CWP Project 'alone' have been assessed to be **Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of Dublin Array OWF and Arklow Bank OWF Phase 2 in much of the north of LA 4a and intermittently in the south of LA 4a, with intermittent visibility of NISA OWF. During operation, given a cumulative baseline where the effects of the CWP Project's offshore infrastructure are added to NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, the CWP Project would have a similar effect on LA 4a due to the other OWFs appearing in different parts of views from LA 4a, although Arklow Bank OWF Phase 2 would be closer to the southern extent of LA 4a. The resultant magnitude of change would remain **Medium-Low** (medium-small in scale, long-term and localised in terms of geographical extent). The significance of effect would be **Slight** (not significant).
780. **LA 5 Rolling Lowlands Areas 1-6** has been assessed to be of **Medium-Low** sensitivity. During operation, the magnitude of change has been assessed as **Low** and the resultant effects of the CWP Project 'alone' have been assessed to be **Slight** (not significant). The cumulative ZTVs indicate that there would be intermittent visibility of Dublin Array OWF and Arklow Bank OWF Phase 2 in parts of LA 5. During operation, given a cumulative baseline where the effects of the CWP Project's offshore infrastructure are added to Dublin Array OWF and Arklow Bank OWF Phase 2, the CWP Project would have a reduced effect on LA 3c due to the greater visibility of Arklow Bank OWF Phase from LA 5. The resultant magnitude of change would be **Low-Negligible** (small-negligible in scale, long term and localised in terms of geographical extent). The significance of effect would be **Not Significant** (not significant).
781. **TCA 6a Greystones** has been assessed to be of **High-Medium** sensitivity. During operation, the magnitude of change has been assessed as **Medium** and the resultant effects of the CWP Project 'alone' have been assessed to be **Moderate** (not significant). The cumulative ZTVs indicate that there would be intermittent visibility of NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2 in TCA 6a. During operation, given a cumulative baseline where the effects of the CWP Project's offshore infrastructure are added to NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, the CWP Project would have a similar effect on TCA 6a as it would remain the more prominent OWF. The resultant magnitude of change would remain **Medium** (medium in scale, long term and intermediate in terms of geographical extent). The significance of effect would be **Moderate** (not significant).
782. **TCA 6b Kilcoole** has been assessed to be of **Medium-Low** sensitivity. During operation, the magnitude of change has been assessed as **Medium** and the resultant effects of the CWP Project 'alone' are assessed to be **Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of Dublin Array OWF and Arklow Bank OWF Phase 2 in much of TCA 6b and intermittent

visibility of NISA OWF. During operation, given a cumulative baseline where the effects of the CWP Project's offshore infrastructure are added to NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, the CWP Project would have a similar effect on TCA 6b as it would remain the more prominent OWF. The resultant magnitude of change would remain **Medium** (medium in scale, long term and intermediate in terms of geographical extent). The significance of effect would be **Slight** (not significant).

783. **TCA 6c Newcastle** has been assessed to be of **Medium-Low** sensitivity. During operation, the magnitude of change has been assessed as **Medium** and the resultant effects of the CWP Project 'alone' have been assessed to be **Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of Dublin Array OWF and Arklow Bank OWF Phase 2 in much of TCA 6c and intermittent visibility of NISA OWF. During operation, given a cumulative baseline where the effects of the CWP Project's offshore infrastructure are added to NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, the CWP Project would have a similar effect on TCA 6c as it would remain the more prominent OWF. The resultant magnitude of change would remain **Medium** (medium in scale, long term and intermediate in terms of geographical extent). The significance of effect would be **Slight** (not significant).
784. **TCA 6d Wicklow** has been assessed to be of **High-Medium** sensitivity. During operation, the magnitude of change has been assessed as **Medium** and the resultant effects of the CWP Project 'alone' have been assessed to be **Moderate** (not significant). The cumulative ZTVs indicate that there would be intermittent visibility of NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2 in TCA 6d. During operation, given a cumulative baseline where the effects of the CWP Project's offshore infrastructure are added to NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, the CWP Project would have a similar effect on TCA 6d as it would remain the more prominent OWF. The resultant magnitude of change would remain **Medium** (medium in scale, long term and intermediate in terms of geographical extent). The significance of effect would be **Moderate** (not significant).

Wexford County Council Landscape Character Units

785. **LCU 1 Uplands** has been assessed to be of **High-Medium** sensitivity. During operation, the magnitude of change has been assessed as **Low** and the resultant effects of the CWP Project 'alone' have been assessed to be **Slight** (not significant). The cumulative ZTVs indicate that there would be intermittent visibility of Arklow Bank OWF Phase 2 in LCU 1. During operation, given a cumulative baseline where the effects of the CWP Project's offshore infrastructure are added to Arklow Bank OWF Phase 2, the CWP Project would have a reduced effect on LCU 1 due to the closer proximity of Arklow Bank OWF Phase 2. The resultant magnitude of change would be **Low-Negligible** (small-negligible in scale, long term and localised in terms of geographical extent). The significance of effect would be **Not Significant** (not significant).
786. **LCU 2 Lowlands** has been assessed to be of **High-Medium** sensitivity. During operation, the magnitude of change has been assessed as **Medium-Low** and the resultant effects of the CWP Project 'alone' have been assessed to be **Moderate-Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of Arklow Bank OWF Phase 2 in much of LCU 2. During operation, given a cumulative baseline where the effects of the CWP Project's offshore infrastructure are added to Arklow Bank OWF Phase 2, the CWP Project would have a reduced effect on LCU 2 due to the closer proximity of Arklow Bank OWF Phase 2. The resultant magnitude of change would be **Low** (small in scale, long-term and intermediate / localised in terms of geographical extent). The significance of effect would be **Slight** (not significant).
787. **LCU 4 Coastal** has been assessed to be of **High-Medium** sensitivity. During operation, the magnitude of change has been assessed as **Low** and the resultant effects of the CWP Project 'alone' have been assessed to be **Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of Arklow Bank OWF Phase 2 in much of LCU 4. During operation, given a cumulative baseline where the effects of the CWP Project's offshore infrastructure are added to Arklow Bank OWF Phase 2, the

CWP Project would have a reduced effect on LCU 4 due to the closer proximity of Arklow Bank OWF Phase 2. The resultant magnitude of change would be **Low–Negligible** (small–negligible in scale, long term and localised in terms of geographical extent). The significance of effect would be **Not Significant** (not significant).

788. **LCU 5 Distinctive – 5a Kilmichael Point** has been assessed to be of **High–Medium** sensitivity. During operation, the magnitude of change has been assessed as **Low** and the resultant effects of the CWP Project ‘alone’ have been assessed to be **Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of Dublin Array OWF and Arklow Bank OWF Phase 2 in much of 5a Kilmichael Point. During operation, given a cumulative baseline where the effects of the CWP Project’s offshore infrastructure are added to Dublin Array OWF and Arklow Bank OWF Phase 2, the CWP Project would have a reduced effect on 5a Kilmichael Point due to the closer proximity of Arklow Bank OWF Phase 2. The resultant magnitude of change would be **Low–Negligible** (small–negligible in scale, long term and localised in terms of geographical extent). The significance of effect would be **Not Significant** (not significant).
789. **LCU 5. Distinctive - 5b Ask Hill, 5c Tara Hill, 5d Ballyminaun** has been assessed to be of **High–Medium** sensitivity. During operation, the magnitude of change has been assessed as **Low** and the resultant effects of the CWP Project ‘alone’ have been assessed to be **Slight** (not significant). The cumulative ZTVs indicate that there would be intermittent visibility of Dublin Array OWF and Arklow Bank OWF Phase 2 for parts of 5b, 5c and 5d. During operation, given a cumulative baseline where the effects of the CWP Project’s offshore infrastructure are added to Dublin Array OWF and Arklow Bank OWF Phase 2, the CWP Project would have a reduced effect on 5b Ask Hill, 5c Tara Hill, 5d Ballyminaun due to the closer proximity of Arklow Bank OWF Phase 2. The resultant magnitude of change would be **Low–Negligible** (small–negligible in scale, long term and localised in terms of geographical extent). The significance of effect would be **Not Significant** (not significant).

National designated landscape receptors

790. The following National Designated Landscape Receptors have been assessed in **Chapter 15 Seascape, Landscape & Visual Impact Assessment** as having potential effects of **Slight** significance or above during operation:
- Howth Head SAA;
 - North Bull Island SAA; and
 - Bray Head SAA.
791. **Howth Head SAA** has been assessed to be of **High** sensitivity. During operation, the magnitude of change has been assessed as **Low** for landscape and **Medium–Low** for visual amenity and the resultant effects of the CWP Project ‘alone’ have been assessed to be **Moderate–Slight** (not significant) on landscape and **Moderate** (not significant) on visual amenity. The cumulative ZTVs indicate that there would be visibility of NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2 from parts of the SAA, with Dublin Array OWF located closer to this SAA than the CWP Project. During operation, given a cumulative baseline where the effects of the CWP Project’s offshore infrastructure are combined with the effects of NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, the CWP Project would have a slightly reduced effect on this SAA. In relation to the landscape of Howth Head SAA, the resultant magnitude of change would be **Low–Negligible** (small–negligible in scale, long term and intermediate / localised in terms of geographical extent). The significance of effect would be **Slight–Not Significant** (not significant). In relation to the visual amenity of Howth Head SAA, the resultant magnitude of change would be **Low** (small in scale, long term and intermediate / localised in terms of geographical extent). The significance of effect would be **Slight** (not significant).

792. **North Bull Island SAA** has been assessed to be of **High** sensitivity. During operation, the magnitude of change has been assessed as **Low** for landscape and **Medium–Low** for visual amenity and the resultant effects of the CWP Project ‘alone’ have been assessed to be **Moderate–Slight** (not significant) on landscape and **Moderate** (not significant) on visual amenity. The cumulative ZTVs indicate that there would be visibility of NISA OWF and Dublin Array OWF from much of the SAA, with Dublin Array OWF located closer to this SAA than the CWP Project. During operation, given a cumulative baseline where the effects of the CWP Project’s offshore infrastructure are combined with the effects of NISA OWF and Dublin Array OWF, the CWP Project would have a slightly reduced effect on this SAA. In relation to the landscape of North Bull Island SAA, the resultant magnitude of change would be **Low–Negligible** (small–negligible in scale, long term and intermediate / localised in terms of geographical extent). The significance of effect would be **Slight–Not Significant** (not significant). In relation to the visual amenity of North Bull Island SAA, the resultant magnitude of change would be **Low** (small in scale, long term and intermediate / localised in terms of geographical extent). The significance of effect would be **Slight** (not significant).
793. **Bray Head SSA** has been assessed as of **High** sensitivity. During operation, the magnitude of change has been assessed as **High–Medium** for both landscape and visual amenity and the resultant effects of the CWP Project ‘alone’ have been assessed to be **Significant** (significant) on landscape and **Significant** (significant) on visual amenity. The cumulative ZTVs indicate that there would be intermittent visibility of Dublin Array OWF with some more limited visibility of Arklow Bank OWF Phase 2 and NISA OWF within Bray Head SAA. During operation, given a cumulative baseline where the effects of the CWP Project’s offshore infrastructure are added to those resulting from Dublin Array OWF, Arklow Bank OWF Phase 2 and NISA OWF, the CWP Project’s offshore infrastructure would have a lower magnitude of change on Bray Head SAA compared to the CWP Project ‘alone’ due to the closer proximity of Dublin Array OWF. The resultant magnitude of change for both landscape character and visual amenity would be **Medium** (medium in scale, long term and intermediate in terms of geographical extent). The significance of effect would be **Significant** (significant).

Visual amenity

Visual receptor groups

794. The following Visual Receptor Groups have been assessed in **Chapter 15 Seascape, Landscape & Visual Impact Assessment** as having potential effects of **Slight** significance or above during operation:
- Visual Receptor Group 1 Howth Head to North Bull Island;
 - Visual Receptor Group 2 Killiney to Bray;
 - Visitor Receptor Group 3 Bray Head to Cliff Manor;
 - Visual Receptor Group 4 Cliff Manor, Greystones, Kilcoole to Five Mile Point;
 - Visual Receptor Group 5 Wicklow to Wicklow Head;
 - Visual Receptor Group 6 Dublin and Bray Mountains;
 - Visual Receptor Group 7 Mountain Uplands;
 - Visual Receptor Group 8 Wicklow Head to Brittas Bay; and
 - Visual Receptor Group 9 Marine Recreational Receptors.
795. **Visual Receptor Group 1 Howth Head to North Bull Island** has been assessed to be of **High** sensitivity. During operation, the magnitude of change has been assessed as **Medium–Low** and the resultant effects of the CWP Project ‘alone’ have been assessed to be **Moderate** (not significant). The cumulative ZTVs indicate that there would be visibility of NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, with Dublin Array OWF located slightly closer to this visual receptor group than the CWP Project. During operation, given a cumulative baseline where the CWP Project is added to

NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, the CWP Project would have a slightly reduced effect on this visual receptor group due to the closer proximity of Dublin Array OWF. The resultant magnitude of change would be **Medium-Low** (medium-small in scale, long term and localised in terms of geographical extent). The significance of effect would be **Moderate-Slight** (not significant).

796. **Visual Receptor Group 2 Killiney to Bray** has been assessed to be of **High-Medium** sensitivity. During operation, the magnitude of change has been assessed as **Medium** and the resultant effects of the CWP Project 'alone' have been assessed to be **Moderate** (not significant). The cumulative ZTVs indicate that there would predominantly be visibility of NISA OWF and Dublin Array OWF in combination with the CWP Project from this visual receptor group, with Dublin Array OWF located closer to this visual receptor group than the CWP Project. During operation, given a cumulative baseline where the CWP Project is added to NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, the CWP Project would have a slightly reduced effect on this Visual Receptor Group due to the closer proximity of Dublin Array OWF. The resultant magnitude of change would be **Medium-Low** (medium-small in scale, long term and intermediate / localised in terms of geographical extent). The significance of effect would be **Moderate-Slight** (not significant).
797. **Visual Receptor Group 3 Bray Head to Cliff Manor** has been assessed to be of **High** sensitivity. During operation, the magnitude of change has been assessed as **High-Medium** and the resultant effects of the CWP Project 'alone' have been assessed to be **Significant** (significant). The cumulative ZTVs indicate that there would be visibility of NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, with Dublin Array OWF located slightly closer to this visual receptor group than the CWP Project. During operation, given a cumulative baseline where the CWP Project is added to NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, the CWP Project would have a slightly reduced effect on this visual receptor group due to the closer proximity of Dublin Array OWF. The resultant magnitude of change would be **Medium** (medium in scale, long term and intermediate in terms of geographical extent). The significance of effect would be **Moderate** (not significant).
798. **Visual Receptor Group 4 Cliff Manor, Greystones, Kilcoole to Five Mile Point** has been assessed to be of **High-Medium** sensitivity. During operation, the magnitude of change has been assessed as **High** and the resultant effects of the CWP Project 'alone' have been assessed to be **Very Significant** (significant). The cumulative ZTVs indicate that there would be visibility of NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, with Dublin Array OWF located slightly closer to this Visual Receptor Group than the CWP Project. During operation, given a cumulative baseline where the CWP Project is added to NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, the CWP Project would have a slightly reduced effect on this visual receptor group due to the closer proximity of Dublin Array OWF. The resultant magnitude of change would be **High-Medium** (large-medium in scale, long term and wide in terms of geographical extent). The significance of effect would be **Significant** (significant).
799. **Visual Receptor Group 5 Wicklow to Wicklow Head** has been assessed to be of **High-Medium** sensitivity. During operation, the magnitude of change has been assessed as **High-Medium** and the resultant effects of the CWP Project 'alone' have been assessed to be **Significant** (significant). The cumulative ZTVs indicate that the main combined visibility from this visual receptor group would be visibility of the Dublin Array OWF with the CWP Project. During operation, given a cumulative baseline where the CWP Project is added to NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, the CWP Project would not have an increased effect on this visual receptor group due to the visual separation between OWFs. The resultant magnitude of change would be **High-Medium** (large-medium in scale, long term and intermediate in terms of geographical extent). The significance of effect would be **Significant** (significant).
800. **Visual Receptor Group 6 Dublin and Bray Mountains** has been assessed to be of **High-Medium** sensitivity. During operation, the magnitude of change has been assessed as **High-Medium** and the resultant effects of the CWP Project 'alone' have been assessed to be **Significant** (significant). The

cumulative ZTVs indicate that there would be visibility of NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2 from the majority of these elevated locations. During operation, given a cumulative baseline where the CWP Project is added to NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, the CWP Project would have a slightly reduced effect on this visual receptor group due to the closer proximity of Dublin Array OWF. The resultant magnitude of change would be **High–Medium** (large–medium in scale, long term and intermediate in terms of geographical extent). The significance of effect would be **Significant** (significant).

801. **Visual Receptor Group 7 Mountain Uplands** has been assessed to be of **High–Medium** sensitivity. During operation, the magnitude of change has been assessed as **Medium** and the resultant effects of the CWP Project ‘alone’ have been assessed to be **Moderate** (not significant). The cumulative ZTVs indicate that there would be visibility of NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2 from the majority of these elevated locations. During operation, given a cumulative baseline where the CWP Project is added to NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, the CWP Project would have a similar effect on this visual receptor group to the CWP Project ‘alone’. The resultant magnitude of change would be **Medium** (medium in scale, long term and intermediate / localised in terms of geographical extent). The significance of effect would be **Moderate** (not significant).
802. **Visual Receptor Group 8 Wicklow Head to Brittas Bay** has been assessed to be of **High–Medium** sensitivity. During operation, the magnitude of change has been assessed as **High–Medium** and the resultant effects of the CWP Project ‘alone’ have been assessed to be **Significant** (significant). The cumulative ZTVs indicate that there would predominantly be visibility of Arklow Bank OWF Phase 2, which would be located slightly closer to this Visual Receptor Group than the CWP Project. During operation, given a cumulative baseline where the CWP Project is added to NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, the CWP Project would have a slightly reduced effect on this Visual Receptor Group due to the closer proximity of Arklow Bank OWF Phase 2. The resultant magnitude of change would be **Medium** (medium in scale, long term and intermediate in terms of geographical extent). The significance of effect would be **Moderate** (not significant).
803. **Visual Receptor Group 9 Marine Recreational Receptors** has been assessed to be of **High–Medium** sensitivity. During operation, the magnitude of change has been assessed as **High** and the resultant effects of the CWP Project ‘alone’ have been assessed to be **Very Significant** (significant). The cumulative ZTVs indicate that there would be potential for combined visibility from this Visual Receptor Group with NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2. During operation, given a cumulative baseline where the CWP Project is added to NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, the CWP Project would not have an increased effect on this visual receptor group. The resultant magnitude of change would be **High** (large in scale, long term and wide in terms of geographical extent). The significance of effect would be **Very Significant** (significant).

Main (named) settlements

804. The following main (named) settlements have been assessed in **Chapter 15 Seascape, Landscape & Visual Impact Assessment** as having potential effects of **Slight** significance or above during operation:
- Dublin and its coastal suburbs including Merrion in the south and Baldoyle in the north.
 - Dun Laoghaire and adjacent settlements, including Booterstown, Blackrock, Monkstown to the north of the Harbour and Sandycove and Dalkey to the south of the harbour;
 - Killiney (covering Shankill to the south);
 - Bray;
 - Greystones;
 - Kilcoole;

- Newcastle;
- Newton Mount Kennedy;
- Wicklow; and
- Arklow.

805. **Dublin** and its coastal suburbs, including Merrion in the south and Baldoyle in the north has been assessed to be of **High–Medium** sensitivity. During operation, the magnitude of change has been assessed as **Medium–Low** and the resultant effects of the CWP Project ‘alone’ have been assessed to be **Moderate–Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of NISA OWF and Dublin Array OWF from locations within Dublin and its coastal suburbs, with Dublin Array OWF located closer to this Settlement than the CWP Project. During operation, given a cumulative baseline where the effects of the CWP Project’s offshore infrastructure are added to NISA OWF and Dublin Array OWF, the CWP Project would have a slightly reduced effect in views from the settlement. The resultant magnitude of change would be **Low** (small in scale, long term and localised in terms of geographical extent). The significance of effect would be **Slight** (not significant).
806. **Dun Laoghaire** and adjacent settlements (including Booterstown, Blackrock, Monkstown to the north of the Harbour and Sandycove and Dalkey to the south of the harbour) has been assessed to be of **High–Medium** sensitivity. During operation, the magnitude of change has been assessed as **Medium–Low** and the resultant effects of the CWP Project ‘alone’ have been assessed to be **Moderate–Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of NISA OWF and Dublin Array OWF from locations within Dun Laoghaire and adjacent settlements, with Dublin Array OWF located closer to this Settlement than the CWP Project. During operation, given a cumulative baseline where the effects of the CWP Project’s offshore infrastructure are added to NISA OWF and Dublin Array OWF, the CWP Project would have a slightly reduced effect in views from the settlement. The resultant magnitude of change would be **Low** (small in scale, long term and localised in terms of geographical extent). The significance of effect would be **Slight** (not significant).
807. **Killiney** (covering Shankill to the south) has been assessed to be of **High–Medium** sensitivity. During operation, the magnitude of change has been assessed as **Medium** and the resultant effects of the CWP Project ‘alone’ have been assessed to be **Moderate** (not significant). The cumulative ZTVs indicate that there would be visibility of, NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2 from locations within Killiney, with Dublin Array OWF located slightly closer to this Settlement than the CWP Project. During operation, given a cumulative baseline where the effects of the CWP Project’s offshore infrastructure are added to NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, the CWP Project would have a slightly reduced effect in views from the settlement due to the closer proximity of Dublin Array OWF. The resultant magnitude of change would be **Medium–Low** (medium–small in scale, long term and localised in terms of geographical extent). The significance of effect would be **Moderate–Slight** (not significant).
808. **Bray** has been assessed to be of **High–Medium** sensitivity. During operation, the magnitude of change has been assessed as **Medium** and the resultant effects of the CWP Project ‘alone’ have been assessed to be **Moderate** (not significant). The cumulative ZTVs indicate that there is mostly likely to be visibility of NISA OWF and Dublin Array OWF from locations within Bray, with Dublin Array OWF located slightly closer to this settlement than the CWP Project. During operation, given a cumulative baseline where the effects of the CWP Project’s offshore infrastructure are added to NISA OWF and Dublin Array OWF, the CWP Project would have a slightly reduced effect in views from the settlement due to the closer proximity of Dublin Array OWF. The resultant magnitude of change would be **Medium–Low** (medium–small in scale, long term and intermediate / localised in terms of geographical extent). The significance of effect would be **Moderate–Slight** (not significant).
809. **Greystones** has been assessed to be of **High–Medium** sensitivity. During operation, the magnitude of change has been assessed as **High** and the resultant effects of the CWP Project ‘alone’ have been assessed to be **Very Significant** (significant). The cumulative ZTVs indicate that there is most likely to be visibility of NISA OWF and Dublin Array OWF from locations within Greystones, with Dublin Array

OWF located slightly closer to this settlement than the CWP Project. During operation, given a cumulative baseline where the effects of the CWP Project's offshore infrastructure are added to NISA OWF and Dublin Array OWF, the CWP Project would have a slightly reduced effect in views from the settlement. The resultant magnitude of change would be **High-Medium** (large-medium in scale, long term and wide in terms of geographical extent). The significance of effect would be **Significant** (significant).

810. **Kilcoole** has been assessed to be of **High-Medium** sensitivity. During operation, the magnitude of change has been assessed as **High** and the resultant effects of the CWP Project 'alone' have been assessed to be **Very Significant** (significant). The cumulative ZTVs indicate that there would be visibility of NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2 from locations within Kilcoole. In a cumulative baseline where the effects of the CWP Project's offshore infrastructure are added to NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, the CWP Project would be further from the viewpoint than Dublin Array OWF, but the two OWFs would combine to create a wider extent of wind development in the view. The resultant magnitude of change would remain **High** (large in scale, long term and wide in terms of geographical extent). The significance of effect would be **Very Significant** (significant).
811. **Newcastle** has been assessed to be of **High-Medium** sensitivity. During operation, the magnitude of change has been assessed as **High** and the resultant effects of the CWP Project 'alone' have been assessed to be **Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2 from locations within Newcastle. During operation, given a cumulative baseline where the effects of the CWP Project's offshore infrastructure are added to Dublin Array OWF and Arklow Bank OWF Phase 2, all three OWFs would be located at similar distances from Newcastle but visually separate from the CWP Project. The resultant magnitude of change would be **Low** (small-negligible in scale, long term and wide in terms of geographical extent). The significance of effect would be **Slight** (not significant).
812. **Newton Mount Kennedy** has been assessed to be of **High-Medium** sensitivity. During operation, the magnitude of change has been assessed as **Low** and the resultant effects of the CWP Project 'alone' have been assessed to be **Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of Dublin Array OWF and Arklow Bank OWF Phase 2 from locations within Newton Mount Kennedy. During operation, given a cumulative baseline where the effects of the CWP Project's offshore infrastructure are added to Dublin Array OWF and Arklow Bank OWF Phase 2, all three OWFs would be located at similar distances from Newcastle but visually separate from the CWP Project. The resultant magnitude of change would be **Low** (small-negligible in scale, long term and wide in terms of geographical extent). The significance of effect would be **Slight** (not significant).
813. **Wicklow** has been assessed to be of **High-Medium** sensitivity. During operation, the magnitude of change has been assessed as **High-Medium** and the resultant effects of the CWP Project 'alone' have been assessed to be **Significant** (significant). The cumulative ZTVs indicate that there would be visibility of NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2 from locations within Wicklow. During operation, given a cumulative baseline where the effects of the CWP Project's offshore infrastructure are added to Dublin Array OWF, the two OWFs would be located at similar distances from Wicklow but visually separate. The resultant magnitude of change would be **High-Medium** (large-medium in scale, long term and intermediate in terms of geographical extent). The significance of effect would be **Significant** (significant).
814. **Arklow** has been assessed to be of **High-Medium** sensitivity. During operation, the magnitude of change has been assessed as **Medium-Low** and the resultant effects of the CWP Project 'alone' have been assessed to be **Moderate-Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of Arklow Bank OWF Phase 2 from locations within Arklow, around the operational Arklow Bank OWF Phase 1 and extending slightly in front of the CWP Project. During operation, given a cumulative baseline where the effects of the CWP Project's offshore infrastructure are added to Arklow Bank OWF Phase 2, the CWP Project would have a slightly reduced effect in views from the settlement

due to the closer proximity of Arklow Bank OWF Phase 2. The resultant magnitude of change would be **Low** (small in scale, long term and localised in terms of geographical extent). The significance of effect would be **Slight** (not significant).

Key routes

815. The following key routes have been assessed in **Chapter 15 Seascape, Landscape & Visual Impact Assessment** as having potential effects of **Slight** significance or above during operation:
- R105 Road;
 - R807 Road;
 - R131 Road;
 - R119 Road;
 - R761 Road;
 - M11 / N11 Road;
 - R750 Road;
 - DART Line (Dublin to Greystones) / Dublin to Rosslare Main Line (Greystones to Wicklow));
 - Northern Sea approaches to Dublin Port (Liverpool to Dublin and Holyhead to Dublin);
 - Southern Sea approach to Dublin Port (Dublin to Cherbourg);
 - Howth Head Loop;
 - North Bull Wall;
 - Great South Wall;
 - Bray–Greystone Coastal Walk;
 - Greystone to Wicklow Trail; and
 - The Wicklow Way.
816. **R105 Road** has been assessed to be of **High–Medium** sensitivity for section b and **Medium** sensitivity for section a. During operation, the magnitude of change has been assessed as **Medium–Low** and the resultant effects of the CWP Project ‘alone’ are assessed as **Slight** (not significant) for section a and **Moderate–Slight** (not significant) for section b. The cumulative ZTVs indicate that there would be potential visibility of NISA OWF and Dublin Array OWF from locations along the R105, with Dublin Array OWF located closer to the road than the CWP Project. During operation, given a cumulative baseline where the of the CWP Project’s offshore infrastructure are added to those resulting from NISA OWF and Dublin Array OWF, the CWP Project would have a reduced effect on users of this road due to the closer proximity of Dublin Array OWF. The resultant magnitude of change for sections a and b would be **Low** (small in scale, long term and localised in terms of geographical extent). The significance of effect would be **Slight** (not significant).
817. **R807 Road** has been assessed to be of **Medium–Low** sensitivity. During operation, the magnitude of change has been assessed as **Low** and the resultant effects of the CWP Project ‘alone’ have been assessed as **Slight** (not significant). The cumulative ZTVs indicate that there would be potential visibility of NISA OWF and Dublin Array OWF from locations along the R807, with Dublin Array OWF located closer to the road than the CWP Project. During operation, given a cumulative baseline where the of the CWP Project’s offshore infrastructure are added to those resulting from NISA OWF and Dublin Array OWF, the CWP Project would have a reduced effect on users of this road due to the closer proximity of Dublin Array OWF. The resultant magnitude of change for sections a and b would be **Low–Negligible** (small–negligible in scale, long term and intermediate / localised in terms of geographical extent). The significance of effect would be **Not Significant** (not significant).
818. **R131 Road** has been assessed to be of **Medium** sensitivity. During operation, the magnitude of change has been assessed as **Low** and the resultant effects of the CWP Project ‘alone’ have been assessed as **Slight** (not significant) for section a southern edge of Sean Moor Park / Sandymount Beach to the northern edge of Sandymount Strand. The cumulative ZTVs indicate that there would be

potential visibility of NISA OWF and Dublin Array OWF from locations along the R131, with Dublin Array OWF located closer to the road than the CWP Project. During operation, given a cumulative baseline where the effects of the CWP Project's offshore infrastructure are added to those resulting from NISA OWF and Dublin Array OWF, the CWP Project would have a reduced effect on users of this road due to the closer proximity of Dublin Array OWF. The resultant magnitude of change would be **Low–Negligible** (small–negligible in scale, long term and localised in terms of geographical extent). The significance of effect would be **Not Significant** (not significant).

819. **R119 Road** has been assessed to be of **Medium** sensitivity. During operation, the magnitude of change has been assessed as **Medium** and the resultant effects of the CWP Project 'alone' have been assessed to be **Moderate** (not significant) for section b (Dalkey / Sorrento Point to Shankill / Ballybrack (Seafield Road)). The cumulative ZTVs indicate that there would be intermittent visibility of NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2 from locations along section b of the R119, with Dublin Array OWF located closer to the road than the CWP Project. During operation, given a cumulative baseline where the effects of the CWP Project's offshore infrastructure are added to those resulting from NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, the CWP Project would have a reduced effect on users of this road due to the closer proximity of Dublin Array OWF. The resultant magnitude of change would be **Medium–Low** (medium–small in scale, long term and intermediate in terms of geographical extent). The significance of effect would be **Slight** (not significant).
820. **R761 Road** has been assessed to be of **Medium** sensitivity. During operation, the magnitude of change has been assessed as **Medium–Low** and the resultant effects of the CWP Project 'alone' have been assessed as **Slight** (not significant) for sections b (southern edge of Bray to northern edge of Greystones), section c (southern edge of Greystones to northern edge of Newcastle (with no visibility through Kilcoole)) and section d (southern edge of Newcastle to Rathnew). The cumulative ZTVs indicate that there would be visibility of Dublin Array OWF and Arklow Bank OWF Phase 2 from much of the R761, with intermittent visibility of NISA OWF. At the northern end of the R761, Dublin Array OWF located closer to the road than the CWP Project. During operation, given a cumulative baseline where the effects of the CWP Project's offshore infrastructure are added to those resulting from Dublin Array OWF and Arklow Bank OWF Phase 2, the CWP Project would have a reduced effect on users of this road due to the closer proximity of Dublin Array OWF. The resultant magnitude of change for the road as a whole and sections b-d would remain **Low** (medium–small in scale, long term and localised in terms of geographical extent). The significance of effect would be **Slight** (not significant).
821. **M11 / N11** has been assessed of **Medium** sensitivity. During operation, the magnitude of change has been assessed as **Medium–Low** and the resultant effects of the CWP Project 'alone' have been assessed as **Slight** (not significant) for section b (from Delgany (west of Greystones) to Junction 17 (southwest of Wicklow)). The cumulative ZTVs indicate that there would be intermittent visibility of Dublin Array OWF and Arklow Bank OWF Phase 2 from stretches of the M11 / N11, with more limited visibility of NISA OWF from the north of the M11 / N11. For much of the M11 / N11, the OWFs would appear in different areas of the view to the CWP Project. During operation, given a cumulative baseline where the effects of the CWP Project's offshore infrastructure are added to those resulting from Dublin Array OWF, Arklow Bank OWF Phase 2 and NISA OWF, the CWP Project would be visually separated from the other OWFs. The resultant magnitude of change for section b would remain **Medium–Low** (medium-small in scale, long term and localised in terms of geographical extent). The significance of effect would be **Slight** (not significant).
822. **R750 Road** has been assessed to be of **High–Medium** sensitivity. During operation, the magnitude of change has been assessed as **Medium** and the resultant effects of the CWP Project 'alone' have been assessed as **Moderate** (not significant) overall, with a **Moderate–Slight** (not significant) for section a (Wicklow to Ballynacarrig north of Brittas), section c (Mizen Head to Ennereilly (just south of Sallymount)) and section d (Ennereilly (just south of Sallymount) to Aisling / Seabank) and for section b (Brittas to Mizen Head) a **Moderate** (not significant) effect. The cumulative ZTVs indicate that there

would be visibility of Arklow Bank OWF Phase 2 from sections of the R750 and occasional visibility of Dublin Array OWF, with Arklow Bank OWF Phase 2 located closer to the road than the CWP Project. During operation, given a cumulative baseline where the effects of the CWP Project's offshore infrastructure are added to those resulting from Dublin Array OWF and Arklow Bank OWF Phase 2, the CWP Project would have a reduced effect on users of this road due to the closer proximity of Arklow Bank OWF Phase 2. The resultant magnitude of change for the route overall and for section b **Medium-Low** (medium-small in scale, long term and intermediate in terms of geographical extent). The significance of effect would be **Moderate-Slight** (not significant). The resultant magnitude of change for the remaining sections of the R750 would be **Low** (small in scale, long-term and intermediate in terms of geographical extent). The significance of effect would be **Slight** (not significant).

823. **DART line (Dublin to Greystones) / Dublin to Rosslare Main Line (Greystones to Wicklow)** has been assessed to be of **Medium** sensitivity. During operation, the magnitude of change has been assessed as **High-Medium** and the resultant effects of the CWP Project 'alone' have been assessed as **Moderate** (not significant) overall, with a **Significant-Moderate** (significant) effect for section d (Bray Head to Wicklow) and a **Slight** (not significant) effect for section c (Dalkey / Sorrento Point to Bray). The cumulative ZTVs indicate that there would be intermittent visibility of NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2 from locations along the length of the DART line. At various points along the route Dublin Array OWF or Arklow Bank OWF Phase 2 would be located closer to the DART line than the CWP Project. During operation, given a cumulative baseline where the effects of the CWP Project's offshore infrastructure are added to those resulting from NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, the CWP Project would have a reduced effect on users of this route due to the closer proximity of Dublin Array OWF or Arklow Bank OWF Phase 2. The resultant magnitude of change for the overall route would be **Medium** (medium in scale, long term and wide in terms of geographical extent). The significance of effect would be **Moderate** (not significant). The resultant magnitude of change for section c would be **Medium-Low** (medium-small in scale, long term and intermediate in terms of geographical extent). The significance of effect would be **Slight** (not significant). The resultant magnitude of change for section d would remain **High** (large in scale, long term and intermediate in terms of geographical extent). The significance of effect would be **Significant-Moderate** (significant).
824. **Northern Sea approaches to Dublin Port** (Liverpool to Dublin and Holyhead to Dublin) has been assessed to be of **Medium** sensitivity. During operation, the magnitude of change has been assessed as **Medium-Low** and the resultant effects of the CWP Project 'alone' have been assessed as **Slight** (not significant) overall and for section a) 20-40 km from the outer edge of the array. The cumulative ZTVs indicate that there would be visibility of NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2 from this ferry route. For most of the ferry route, Dublin Array OWF would be located closer to the ferry route than the CWP Project. During operation, given a cumulative baseline where the effects of the CWP Project's offshore infrastructure are added to those resulting from NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, the CWP Project would have a reduced effect on users of this route due to the closer proximity of Dublin Array OWF. The resultant magnitude of change for section a would be **Low** (small in scale, long term and intermediate in terms of geographical extent). The significance of effect would be **Slight** (not significant).
825. **Southern Approach to approach to Dublin Port** (Dublin to Cherbourg) has been assessed to be of **Medium-Low** or **Medium** sensitivity. During operation, the magnitude of change has been assessed as **High** for section a) 0-10 km, **High-Medium** for section b) 10-20 km, **Medium-Low** for section c) 20-40 km and **Negligible** for section d) 40-50 km. The overall resultant effects of the CWP Project 'alone' have been assessed as **Moderate** (not significant) with variations along the route ranging from **Moderate or Significant-Moderate** (significant) for section a) (0-10 km), **Moderate or Moderate-Slight** for section b) (10-20 km), **Slight** for section c) (20-40 km) and **Imperceptible** for Section d) 40-50 km. The cumulative ZTVs indicate that there would be visibility of Dublin Array OWF and Arklow Bank OWF Phase 2 from this ferry route, with NISA OWF likely to be visible north of the CWP Project.

At various points along the route Dublin Array OWF or Arklow Bank OWF Phase 2 would be located closer to the ferry route than the CWP Project. During operation, given a cumulative baseline where the effects of the CWP Project's offshore infrastructure are added to those resulting from NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, the CWP Project would have a reduced effect on the ferry route due to the closer proximity of Dublin Array OWF or Arklow Bank OWF Phase 2. The resultant magnitude of change for section a would remain **High** (large in scale, long term and wide in terms of geographical extent). The significance of effect would be **Moderate or Significant-Moderate** (significant). The resultant magnitude of change for section b, where Arklow Bank OWF Phase 2 would be closer to the ferry route, would be **Medium** (medium in scale, long term and intermediate in terms of geographical extent). The significance of effect would be **Moderate** (not significant). The resultant magnitude of change for section c, where Arklow Bank OWF Phase 2 would be closer to the ferry route, would be **Low** (small in scale, long term and localised in terms of geographical extent). The significance of effect would be **Slight** (not significant). The resultant magnitude of change for the ferry route overall would be **Medium-Low** (medium-small in scale, long term and intermediate in terms of geographical extent). The significance of effect would be **Slight** (not significant).

826. **Howth Head Loop** has been assessed to be of **High** sensitivity. During operation, the magnitude of change has been assessed as **Medium-Low** and the resultant effects of the CWP Project 'alone' have been assessed as **Moderate** (not significant). The cumulative ZTVs indicate that there would be potential visibility of NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2 from the Howth Head Loop. Dublin Array OWF would be located closer to the Howth Head Loop than the CWP Project. During operation, given a cumulative baseline where the effects of the CWP Project's offshore infrastructure are added to those resulting from NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, the CWP Project would have a reduced effect on the Howth Head Loop due to the closer proximity of Dublin Array OWF. The resultant magnitude of change would be **Low** (small in scale, long term and localised in terms of geographical extent). The significance of effect would be **Moderate-Slight** (not significant).
827. **North Bull Wall** has been assessed to be of **High** sensitivity. During operation, the magnitude of change has been assessed as **Medium-Low** and the resultant effects of the CWP Project 'alone' have been assessed as **Moderate** (not significant). The cumulative ZTVs indicate that there would be potential visibility of NISA OWF and Dublin Array OWF from the North Bull Wall. Dublin Array OWF would be located closer to the North Bull Wall than the CWP Project. During operation, given a cumulative baseline where the effects of the CWP Project's offshore infrastructure are added to those resulting from NISA OWF and Dublin Array OWF, the CWP Project would have a reduced effect on the North Bull Wall due to the closer proximity of Dublin Array OWF. The resultant magnitude of change would be **Low** (small in scale, long-term and localised in terms of geographical extent). The significance of effect would be **Moderate-Slight** (not significant).
828. **Great South Wall** has been assessed to be of **High-Medium** sensitivity. During operation, the magnitude of change has been assessed as **Medium-Low** and the resultant effects of the CWP Project 'alone' have been assessed as **Moderate-Slight** (not significant). The cumulative ZTVs indicate that there would be potential visibility of NISA OWF and Dublin Array OWF from the Great Wall South. Dublin Array OWF would be located closer to the Great South Wall than the CWP Project. During operation, given a cumulative baseline where the effects of the CWP Project's offshore infrastructure are added to those resulting from NISA OWF and Dublin Array OWF, the CWP Project would have a reduced effect on the Great South Wall due to the closer proximity of Dublin Array OWF. The resultant magnitude of change would be **Low** (small in scale, long term and localised in terms of geographical extent). The significance of effect would be **Slight** (not significant).
829. **Bray-Greystones Cliff Walk** has been assessed to be of **High-Medium** sensitivity. During operation, the magnitude of change has been assessed as **High** and the resultant effects of the CWP Project 'alone' have been assessed as **Very Significant** (significant). The cumulative ZTVs indicate that there would be visibility of NISA OWF and Dublin Array OWF from the Cliff Walk, with intermittent visibility

of Arklow Bank OWF Phase 2. Dublin Array OWF would be located closer to the Cliff Walk than the CWP Project. During operation, given a cumulative baseline where the effects of the CWP Project's offshore infrastructure are added to those resulting from NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, the CWP Project would have a reduced effect on the Bray–Greystones Cliff Walk due to the closer proximity of Dublin Array OWF. The resultant magnitude of change would be lower than CWP Project 'alone' at **High–Medium** (large–medium to medium in scale, long term and wide / intermediate in terms of geographical extent) compared to **High**. The significance of effect would be **Significant** (significant).

830. **Greystones to Wicklow Trail** has been assessed to be of **High–Medium** sensitivity. During operation, the magnitude of change has been assessed as **High** and the resultant effects of the CWP Project 'alone' have been assessed as **Very Significant** (significant). The cumulative ZTVs indicate that there would be visibility of NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2 from the majority of the Trail. Dublin Array OWF would be located closer to the Trail than the CWP Project at the northern end of the route. During operation, given a cumulative baseline where the effects of the CWP Project's offshore infrastructure are added to those resulting from NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, the CWP Project would have a reduced effect on the Trail due to the closer proximity of Dublin Array OWF. The resultant magnitude of change for the route would remain **High** (large–medium in scale, long term and intermediate in terms of geographical extent). The significance of effect would be **Very Significant** (significant).
831. **The Wicklow Way** has been assessed to be of **High–Medium** sensitivity. During operation, the magnitude of change has been assessed as **Medium** and the resultant effects of the CWP Project 'alone' have been assessed as **Moderate** (not significant) for all sections of the route where there would be inter visibility (sections a, b c and d). The cumulative ZTVs indicate that there would be intermittent visibility of NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2 from locations along the length of the Wicklow Way. During operation, given a cumulative baseline where the effects of the CWP Project's offshore infrastructure are added to those resulting from NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, the CWP Project would be visually separated from the other OWFs. The resultant magnitude of change for sections a, b c and d would remain **Medium** (medium in scale, long term and localised in terms of geographical extent). The significance of effect would be **Moderate** (not significant).
832. The SLVIA assessors judged that there would be very significant and significant adverse cumulative effects on the following receptors:

Very significant adverse cumulative effects in EIA terms:

- Visual Receptor Group 9 Marine Recreational Receptors
- Main (Named) Settlement - Kilcoole
- Key route - Greystone to Wicklow Trail

Significant adverse cumulative effects in EIA terms:

- Landscape and Townscape: LA 2a Northern Coastal Area
- National Designated Landscape: Bray Head SAA
- Visual Receptor Group 4 Cliff Manor, Greystones, Kilcoole to Five Mile Point
- Visual Receptor Group 5 Wicklow to Wicklow Head
- Visual Receptor Group 6 Dublin and Bray Mountains
- Main (Named) Settlement Greystones
- Main (Named) Settlement Wicklow
- Key Routes - Bray–Greystone Cliff Walk
- Key Routes - Southern Sea approach to Dublin Port (Dublin to Cherbourg): Receptors would experience **Moderate or Significant–Moderate** (significant) cumulative effects for section a (0–10 km). The overall cumulative effect would be **Slight** (not significant).

- Key Routes - DART Line (Dublin to Greystones / Dublin to Rosslare Main Line (Greystones to Wicklow) Receptors would experience a **Significant–Moderate adverse** (significant) cumulative effect for section d (Bray Head to Wicklow) of the route whilst for remaining sections of the route receptors would experience not significant effects

Cumulative Impact 4: Direct / indirect long term though reversible nighttime impacts on seascape / landscape and townscape / national designated landscapes and visual receptors.

Seascape receptors

833. The following Regional Seascape Receptors have been assessed in **Chapter 15 Seascape, Landscape & Visual Impact Assessment** as having potential effects of **Slight** significance or above at night during operation:
- RSCA 13 South Irish Sea; and
 - RSCA 14 Irish Sea, Sandbank and Broad Bays.
834. **RSCA 13 South Irish Sea** has been assessed to be of **Medium** sensitivity. During operation (nighttime), the magnitude of change has been assessed as **Low** and the resultant effects of CWP Project 'alone' have been assessed to be **Slight** (not significant). The operational Arklow Bank OWF Phase 1 is located within this RSCA. Arklow Bank OWF Phase 2 would be located within this RSCA, with Dublin Array OWF located approximately 22.5 km north of the RSCA and NISA OWF approximately 70.2 km north. During operation, given a cumulative baseline where the lighting at the CWP Project's offshore infrastructure is added to lighting associated with Arklow Bank OWF Phase 2, Dublin Array OWF and NISA OWF, the lighting associated with the CWP Project's offshore infrastructure would have a reduced effect on this RSCA. The resultant magnitude of change would be **Low–Negligible** (small–negligible in scale, long term and localised in terms of geographical extent). The significance of effect would be **Not Significant** (not significant).
835. **RSCA 14 Irish Sea, Sandbank and Broad Bays** has been assessed to be of **Medium** sensitivity. During operation (night-time), the magnitude of change has been assessed as **Medium–Low** and the resultant effects of CWP Project 'alone' have been assessed to be **Slight** (not significant). Dublin Array OWF would be partly located within this RSCA, with NISA OWF approximately 41.4 km north of the RSCA and Arklow Bank OWF Phase 2 located approximately 4.1km south. During operation, given a cumulative baseline where the lighting at the CWP Project's offshore infrastructure is added to lighting associated with Dublin Array OWF, NISA OWF and Arklow Bank OWF Phase 2, the lighting associated with the CWP Project's offshore infrastructure would have a slightly reduced effect on this RSCA as lighting at Dublin Array OWF would already affect this RSCA. However, the resultant magnitude of change would remain **Medium–Low** (medium in scale, long term and localised in terms of geographical extent). The significance of effect would be **Slight** (not significant).

Landscape / townscape character receptors

836. The following Landscape / Townscape Character Areas have been assessed in **Chapter 15 Seascape, Landscape & Visual Impact Assessment** as having potential effects of **Slight** significance or above at night during operation:
- Dun Laoghaire–Rathdown County Council Landscape and Townscape Character Areas
 - LCA 10. Rathmichael;
 - LCA 11. Ballyman;
 - LCA 12. Shanganagh;

- TCA 5 Dalkey Island;
- TCA 6 Killiney Bay; and
- TCA 7 Shankill.
- Wicklow County Council Landscape Areas and Townscape Character Areas
 - LA 1c. The Bray Mountains Group;
 - LCA 1d. The North Eastern Valley;
 - LA 2a. Northern Coastal Area;
 - LA 2b. Southern Coastal Area;
 - LA 3a. North East Mountain Lowlands;
 - LA 3b. South East Mountain Lowlands;
 - LA 4a. N11;
 - TCA 6a Greystones;
 - TCA 6b Kilcoole;
 - TCA 6c Newcastle; and
 - TCA 6d Wicklow.
- Wexford County Council Landscape Character Units
 - LCU 2. Lowlands.

Dun Laoghaire–Rathdown County Council Landscape and Townscape Character Areas

837. **LCA 10. Rathmichael** has been assessed to be of **Medium** sensitivity. During operation (night-time), the magnitude of change has been assessed as **Low** and the resultant effects of the CWP Project 'alone' have been assessed to be **Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of the lighting at NISA OWF and Dublin Array OWF throughout much of LCA 10. During operation (night-time), given a cumulative baseline where the effects of the CWP Project's offshore infrastructure are added to the lighting of NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, the lighting of the CWP Project's offshore infrastructure would have a reduced effect on LCA 10 due to the closer proximity of Dublin Array OWF. The resultant magnitude of change would be **Low–Negligible** (small–negligible in scale, long term and wide / intermediate in terms of geographical extent). The significance of effect would be **Slight** (not significant).
838. **LCA 11. Ballyman** has been assessed to be of **Medium** sensitivity. During operation (night-time), the magnitude of change has been assessed as **Low** and the resultant effects of the CWP Project 'alone' have been assessed to be **Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of the lighting of Dublin Array OWF throughout much of LCA 11, with more intermittent visibility of NISA OWF. During operation (night-time), given a cumulative baseline where the effects of the CWP Project's offshore infrastructure are added to the lighting of NISA OWF and Dublin Array OWF, the lighting of the CWP Project's offshore infrastructure would have a reduced effect on LCA 11 due to the closer proximity of Dublin Array OWF. The resultant magnitude of change would be **Low–Negligible** (small–negligible in scale, long- erm and intermediate in terms of geographical extent). The significance of effect would be **Not Significant** (not significant).
839. **LCA 12. Shanganagh** has been assessed to be of **Medium** sensitivity. During operation (night-time), the magnitude of change has been assessed as **Low** and the resultant effects of the CWP Project 'alone' have been assessed to be **Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of the lighting at Dublin Array OWF throughout much of LCA 12, with more intermittent visibility of NISA OWF. During operation (night-time), given a cumulative baseline where the effects of the CWP Project's offshore infrastructure are added to the lighting at NISA OWF and Dublin Array OWF, the lighting of the CWP Project's offshore infrastructure would have a reduced effect on LCA 12 due to the closer proximity of Dublin Array OWF. The resultant magnitude of change

would be **Low-Negligible** (small–negligible in scale, long term and wide in terms of geographical extent). The significance of effect would be **Not Significant** (not significant).

840. **TCA 5 Dalkey Island** has been assessed to be of **High–Medium** sensitivity. During operation (night-time), the magnitude of change has been assessed as **Low** and the resultant effects of the CWP Project ‘alone’ have been assessed to be **Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of the lighting at NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2 in much of TCA 5. During operation (night-time), given a cumulative baseline where the effects of the CWP Project’s offshore infrastructure are added to the lighting at NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, the lighting of the CWP Project’s offshore infrastructure would have a reduced effect on TCA 5 due to the closer proximity of Dublin Array OWF. The resultant magnitude of change would be **Low–Negligible** (small–negligible in scale, long term and wide in terms of geographical extent). The significance of effect would be **Not Significant** (not significant).
841. **TCA 6 Killiney Bay** has been assessed to be of **High–Medium** sensitivity. During operation (night-time), the magnitude of change has been assessed as **Low** and the resultant effects of the CWP Project ‘alone’ have been assessed to be **Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of the lighting at Dublin Array OWF and Arklow Bank OWF Phase 2 in limited areas of TCA 6. During operation (night-time), given a cumulative baseline where the effects of the CWP Project’s offshore infrastructure are added to the lighting at Dublin Array OWF and Arklow Bank OWF Phase 2, the lighting of the CWP Project’s offshore infrastructure would have a reduced effect on TCA 6 due to the closer proximity of Dublin Array OWF. The resultant magnitude of change would be **Low–Negligible** (small–negligible in scale, long term and localised in terms of geographical extent). The significance of effect would be **Not Significant** (not significant).
842. **TCA 7 Shankill** has been assessed to be of **Medium** sensitivity. During operation (night-time), the magnitude of change has been assessed as **Low** and the resultant effects of the CWP Project ‘alone’ have been assessed to be **Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of the lighting at NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2 in limited areas of TCA 7. During operation (night-time), given a cumulative baseline where the effects of the CWP Project’s offshore infrastructure are added to the lighting at NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, the lighting of the CWP Project’s offshore infrastructure would have a reduced effect on TCA 7 due to the closer proximity of Dublin Array OWF. The resultant magnitude of change would be **Low–Negligible** (small–negligible in scale, long term and localised in terms of geographical extent). The significance of effect would be **Not Significant** (not significant).

Wicklow County Council Landscape Areas and Townscape Character Areas

843. **LA 1c The Bray Mountains Group** has been assessed to be of **High–Medium** sensitivity. During operation (night-time), the magnitude of change has been assessed as **Medium–Low** and the resultant effects of the CWP Project ‘alone’ have been assessed to be **Moderate–Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of the lighting of Arklow Bank OWF Phase 2 in much of LA 1c. During operation (night-time), given a cumulative baseline where the effects of the CWP Project’s offshore infrastructure are added to the lighting of Arklow Bank OWF Phase 2, the lighting of the CWP Project’s offshore infrastructure would have a reduced effect on LA 1c due to the closer proximity of Arklow Bank OWF Phase 2. The resultant magnitude of change would be **Low** (small in scale, long term and intermediate in terms of geographical extent). The significance of effect would be **Slight** (not significant).
844. **LA 1d The North Eastern Valley** has been assessed to be of **High–Medium** sensitivity. During operation (night-time), the magnitude of change has been assessed as **Medium–Low** and the resultant effects of the CWP Project ‘alone’ have been assessed to be **Moderate–Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of the lighting of Dublin Array

OWF in parts of LA 1d and intermittent visibility of NISA OWF and Arklow Bank OWF Phase 2. During operation (night-time), given a cumulative baseline where the effects of the CWP Project's offshore infrastructure are added to the lighting of NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, the lighting of the CWP Project's offshore infrastructure would have a reduced effect on LA 1d due to the closer proximity of Dublin Array OWF. The resultant magnitude of change would be **Negligible** (small in scale, long term and intermediate in terms of geographical extent). The significance of effect would be **Not Significant** (not significant).

845. **LA 2a Northern Coastal Area** has been assessed to be of **High-Medium** sensitivity. During operation (nighttime), the magnitude of change has been assessed as **Medium-Low** and the resultant effects of the CWP Project 'alone' have been assessed to be **Moderate-Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of the lighting of Dublin Array OWF and Arklow Bank OWF Phase 2 in much of LA 2a and intermittent visibility of NISA OWF. During operation (nighttime), given a cumulative baseline where the effects of the CWP Project's offshore infrastructure are added to the lighting at NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, the lighting of the CWP Project would have a similar effect on LA 2a due to the visual separation between OWFs in views from LA 2a. The resultant magnitude of change would remain **Medium-Low** (medium-small in scale, long term and intermediate in terms of geographical extent). The significance of effect would be **Moderate-Slight** (not significant).
846. **LA 2b Southern Coastal Area** has been assessed to be of **High-Medium** sensitivity. During operation (night-time), the magnitude of change has been assessed as **Medium-Low** and the resultant effects of the CWP Project 'alone' have been assessed to be **Moderate-Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of the lighting at Arklow Bank OWF Phase 2 in much of LA 2b and intermittent visibility of Dublin Array OWF. During operation (night-time), given a cumulative baseline where the effects of the CWP Project's offshore infrastructure are added to the lighting at Dublin Array OWF and Arklow Bank OWF Phase 2, the lighting of the CWP Project's offshore infrastructure would have a reduced effect on LA 2b due to the visibility of Arklow Bank OWF Phase 2 from LA 2b. The resultant magnitude of change would be **Medium-Low** (medium-small in scale, long term and intermediate in terms of geographical extent). The significance of effect would be **Moderate-Slight** (not significant).
847. **LA 3a. North East Mountain Lowlands** has been assessed to be of **High-Medium** sensitivity. During operation (night-time), the magnitude of change has been assessed as **Medium-Low** and the resultant effects of the CWP Project 'alone' have been assessed to be **Moderate-Slight** (not significant). The cumulative ZTVs indicate that there would be intermittent visibility of the lighting at NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2 in LA 3a. During operation (night-time), given a cumulative baseline where the effects of the CWP Project's offshore infrastructure are added to the lighting at NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, the lighting of the CWP Project's offshore infrastructure would have a similar effect on LA 3a due to the visual separation between OWFs in views from LA 3a. The resultant magnitude of change would remain **Medium-Low** (medium-small in scale, long-term and intermediate in terms of geographical extent). The significance of effect would be **Moderate-Slight** (not significant).
848. **LA 3b. South East Mountain Lowlands** has been assessed to be of **High-Medium** sensitivity. During operation (night-time), the magnitude of change has been assessed as **Medium-Low** and the resultant effects of the CWP Project 'alone' have been assessed to be **Moderate-Slight** (not significant). The cumulative ZTVs indicate that there would be intermittent visibility of the lighting at Dublin Array OWF and Arklow Bank OWF Phase 2, and to a lesser extent NISA OWF in LA 3b. During operation (night-time), given a cumulative baseline where the effects of the CWP Project's offshore infrastructure are added to the lighting at NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, the lighting of the CWP Project's offshore infrastructure would have a reduced effect on LA 3b due to the greater visibility of Arklow Bank OWF Phase 2 from LA 3b. The resultant magnitude of change

would be **Low** (small in scale, long term and intermediate in terms of geographical extent). The significance of effect would be **Slight** (not significant).

849. **LA 3c. Southern Hills** has been assessed to be of **High–Medium** sensitivity. During operation (night-time), the magnitude of change has been assessed as **Low** and the resultant effects of the CWP Project ‘alone’ have been assessed to be **Slight** (not significant). The cumulative ZTVs indicate that there would be intermittent visibility of the lighting at Dublin Array OWF and Arklow Bank OWF Phase 2, and to a lesser extent NISA OWF in LA 3c. During operation (night-time), given a cumulative baseline where the effects of the CWP Project’s offshore infrastructure are added to the lighting at NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, the lighting of the CWP Project’s offshore infrastructure would have a reduced effect on LA 3c due to the greater visibility of Arklow Bank OWF Phase 2 from LA 3c. The resultant magnitude of change would be **Low–Negligible** (small–negligible in scale, long term and intermediate in terms of geographical extent). The significance of effect would be **Not Significant** (not significant).
850. **LA 4a. N11** has been assessed to be of **Medium–Low** sensitivity. During operation (night-time), the magnitude of change has been assessed as **Low** and the resultant effects of the CWP Project ‘alone’ have been assessed to be **Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of the lighting of Dublin Array OWF and Arklow Bank OWF Phase 2 in much of the north of LA 4a and intermittently in the south of LA 4a, with intermittent visibility of NISA OWF throughout. During operation (night-time), given a cumulative baseline where the effects of the CWP Project’s offshore infrastructure are added to the lighting at NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, the lighting of the CWP Project’s offshore infrastructure would have a similar effect on LA 4a due to the visual separation between OWFs in views from LA 4a, although Arklow Bank OWF Phase 2 would be closer to the southern extent of LA 4a. The resultant magnitude of change would remain **Low** (small in scale, long term and intermediate in terms of geographical extent). The significance of effect would be **Slight** (not significant).
851. **TCA 6a Greystones** has been assessed to be of **High–Medium** sensitivity. During operation (nighttime), the magnitude of change has been assessed as **Medium–Low** and the resultant effects of the CWP Project ‘alone’ have been assessed to be **Moderate–Slight** (not significant). The cumulative ZTVs indicate that there would be intermittent visibility of the lighting at NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2 in TCA 6a. During operation (night-time), given a cumulative baseline where the effects of the CWP Project’s offshore infrastructure are added to the lighting at NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, the lighting of the CWP Project’s offshore infrastructure would have a similar effect on TCA 6a as it would remain the more prominent OWF. The resultant magnitude of change would remain **Medium–Low** (medium–small in scale, long term and intermediate in terms of geographical extent). The significance of effect would be **Moderate–Slight** (not significant).
852. **TCA 6b Kilcoole** has been assessed to be of **Medium–Low** sensitivity. During operation (night-time), the magnitude of change has been assessed as **Medium–Low** and the resultant effects of the CWP Project ‘alone’ have been assessed to be **Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of the lighting at Dublin Array OWF and Arklow Bank OWF Phase 2 in much of TCA 6b and intermittent visibility of NISA OWF. During operation (night-time), given a cumulative baseline where the effects of the CWP Project’s offshore infrastructure are added to the lighting at NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, the lighting of the CWP Project’s offshore infrastructure would have a similar effect on TCA 6b as it would remain the more prominent OWF. The resultant magnitude of change would remain **Medium–Low** (medium–small in scale, long term and intermediate in terms of geographical extent). The significance of effect would be **Slight** (not significant).
853. **TCA 6c Newcastle** has been assessed to be of **Medium–Low** sensitivity. During operation (night-time), the magnitude of change has been assessed as **Medium–Low** and the resultant effects of the CWP Project ‘alone’ have been assessed to be **Slight** (not significant). The cumulative ZTVs indicate

that there would be visibility of the lighting at Dublin Array OWF and Arklow Bank OWF Phase 2 in much of TCA 6c and intermittent visibility of NISA OWF. During operation (night-time), given a cumulative baseline where the effects of the CWP Project's offshore infrastructure are added to the lighting at NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, the lighting of the CWP Project's offshore infrastructure would have a similar effect on TCA 6c as it would remain the more prominent OWF. The resultant magnitude of change would remain **Medium-Low** (medium-small in scale, long term and intermediate in terms of geographical extent). The significance of effect would be **Slight** (not significant).

854. **TCA 6d Wicklow** has been assessed to be of **High-Medium** sensitivity. During operation (night-time), the magnitude of change has been assessed as **Medium-Low** and the resultant effects of the CWP Project 'alone' have been assessed to be **Moderate-Slight** (not significant). The cumulative ZTVs indicate that there would be intermittent visibility of the lighting at NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2 in TCA 6d. During operation (nighttime), given a cumulative baseline where the effects of the CWP Project's offshore infrastructure are added to the lighting at NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, the lighting of the CWP Project's offshore infrastructure would have a similar effect on TCA 6d as it would remain the more prominent OWF. The resultant magnitude of change would remain **Medium-Low** (medium-small in scale, long term and intermediate in terms of geographical extent). The significance of effect would be **Moderate-Slight** (not significant).

Wexford County Council Landscape Character Units

855. **LCU 2. Lowlands** has been assessed to be of **High-Medium** sensitivity. During operation (night-time), the magnitude of change has been assessed as **Low** and the resultant effects of the CWP Project 'alone' have been assessed to be **Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of the lighting at Arklow Bank OWF Phase 2 in much of LCU 2. During operation (night-time), given a cumulative baseline where the effects of the CWP Project's offshore infrastructure are added to the lighting at Arklow Bank OWF Phase 2, the lighting of the CWP Project's offshore infrastructure would have a reduced effect on LCU 2 due to the closer proximity of Arklow Bank OWF Phase 2. The resultant magnitude of change would be **Low-Negligible** (small-negligible in scale, long term and intermediate / localised in terms of geographical extent). The significance of effect would be **Not Significant** (not significant).

National designated landscape receptors

856. Bray Head SAA has been assessed in **Chapter 15 SLVIA** as having potential effects of **Slight** significance or above during operation (night-time). The SAA has been assessed to be of **High** Sensitivity. During operation (nighttime), the magnitude of change has been assessed as **Medium-Low** for both landscape and visual amenity and the resultant effects of the CWP Project 'alone' has been assessed to be **Moderate** (not significant). The cumulative ZTVs indicate that there would be intermittent visibility of the lighting of Dublin Array OWF with some more limited visibility of Arklow Bank OWF Phase 2 and NISA OWF within Bray Head SAA. During operation (nighttime), given a cumulative baseline where the effects of the lighting of the CWP Project's offshore infrastructure is added to the lighting of Dublin Array OWF, Arklow Bank OWF Phase 2 and NISA OWF, the lighting of the CWP Project's offshore infrastructure would have a reduced effect on Bray Head SAA due to the closer proximity of Dublin Array OWF. The resultant magnitude of change for both landscape character and visual amenity would be **Low** (small in scale, long term and intermediate in terms of geographical extent). The significance of effect would be **Slight** (not significant).

Visual amenity

Visual receptor groups

857. The following visual receptor groups have been assessed in **Chapter 15 Seascape, Landscape & Visual Impact Assessment** as having potential effects of **Slight** significance or above during operation (nighttime):
- Visual Receptor Group 2 Killiney to Bray;
 - Visitor Receptor Group 3 Bray Head to Cliff Manor;
 - Visual Receptor Group 4 Cliff Manor, Greystones, Kilcoole to Five Mile Point;
 - Visual Receptor Group 5 Wicklow to Wicklow Head;
 - Visual Receptor Group 6 Dublin and Bray Mountains;
 - Visual Receptor Group 7 Mountain Uplands;
 - Visual Receptor Group 8 Wicklow Head to Brittas Bay; and
 - Visual Receptor Group 9 Marine Recreational Receptors.
858. **Visual Receptor Group 2 Killiney to Bray** has been assessed to be of **High–Medium** sensitivity. During operation (night-time), the magnitude of change has been assessed as **Low** and the resultant effects of the CWP Project ‘alone’ have been assessed to be **Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of lighting at Dublin Array OWF and Arklow Bank OWF Phase 2 from parts of this visual receptor group, with Dublin Array OWF located closer to this Visual Receptor Group than the CWP Project. During operation (night-time), given a cumulative baseline where the effects of the lighting of the CWP Project’s offshore infrastructure is added to the lighting of Dublin Array OWF and Arklow Bank OWF Phase 2, the lighting of the CWP Project’s offshore infrastructure would have a reduced effect on this visual receptor group due to the closer proximity of Dublin Array OWF. The resultant magnitude of change would be **Low–Negligible** (small–negligible in scale, long term and localised in terms of geographical extent). The significance of effect would be **Not Significant** (not significant).
859. **Visual Receptor Group 3 Bray Head to Cliff Manor** has been assessed to be of **High** sensitivity. During operation (night-time), the magnitude of change has been assessed as **Medium–Low** and the resultant effects of the CWP Project ‘alone’ have been assessed to be **Moderate** (not significant). The cumulative ZTVs indicate that there would be visibility of Dublin Array OWF, Arklow Bank OWF Phase 2 and NISA OWF from parts of this visual receptor group, with Dublin Array OWF located closer to this Visual Receptor Group than the CWP Project. During operation (night-time), given a cumulative baseline where the effects of the lighting of the CWP Project’s offshore infrastructure are added to the lighting of Dublin Array OWF, Arklow Bank OWF Phase 2 and NISA OWF, the lighting of the CWP Project’s offshore infrastructure would have a reduced effect on this Visual Receptor Group due to the closer proximity of Dublin Array OWF. The resultant magnitude of change would be **Low** (small in scale, long term and intermediate in terms of geographical extent). The significance of effect would be **Slight** (not significant).
860. **Visual Receptor Group 4 Cliff Manor, Greystones, Kilcoole to Five Mile Point** has been assessed to be of **High–Medium** sensitivity. During operation (night-time), the magnitude of change has been assessed as **Medium–Low** and the resultant effects of the CWP Project ‘alone’ have been assessed to be **Moderate–Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, with Dublin Array OWF located slightly closer to this Visual Receptor Group than CWP. During operation (night-time), given a cumulative baseline where the effects of the lighting of the CWP Project’s offshore infrastructure are added to the lighting of NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, the lighting of the CWP Project’s offshore infrastructure would have a slightly reduced effect on this visual receptor group. The

resultant magnitude of change would be **Low** (small in scale, long term and intermediate / wide in terms of geographical extent). The significance of effect would be **Slight** (not significant).

861. **Visual Receptor Group 5 Wicklow to Wicklow Head** has been assessed to be of **High–Medium** sensitivity. During operation (night-time), the magnitude of change has been assessed as **Medium–Low** and the resultant effects of the CWP Project ‘alone’ have been assessed to be **Moderate–Slight** (not significant). The cumulative ZTVs indicate that the main combined visibility from this visual receptor group would be visibility of the lighting at Dublin Array OWF with lighting at CWP. During operation (nighttime), given a cumulative baseline where the effects of the lighting of the CWP Project’s offshore infrastructure are added to the lighting of NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, the lighting of the CWP Project’s offshore infrastructure would not have an increased effect on this visual receptor group. The resultant magnitude of change would be **Low** (small in scale, long term and intermediate / wide in terms of geographical extent). The significance of effect would be **Slight** (not significant).
862. **Visual Receptor Group 6 Dublin and Bray Mountains** has been assessed to be of **High–Medium** sensitivity. During operation (night-time), the magnitude of change has been assessed as **Medium–Low** and the resultant effects of the CWP Project ‘alone’ have been assessed to be **Moderate–Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of the lighting of Dublin Array OWF, Arklow Bank OWF Phase 2 and NISA OWF from this visual receptor group, which consists of a number of high points in the landscape. During operation (night-time), given a cumulative baseline where the lighting of the CWP Project’s offshore infrastructure is added to the lighting of Dublin Array OWF, Arklow Bank OWF Phase 2 and NISA OWF, the lighting of the CWP Project’s offshore infrastructure would have a slightly reduced effect on this visual receptor group due to the closer proximity of Dublin Array OWF. The resultant magnitude of change would be **Low** (small in scale, long term and intermediate / localised in terms of geographical extent). The significance of effect would be **Slight** (not significant).
863. **Visual Receptor Group 7 Mountain Uplands** has been assessed to be of **High–Medium** sensitivity. During operation (night-time), the magnitude of change has been assessed as **Low** and the resultant effects of the CWP Project ‘alone’ have been assessed to be **Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of Dublin Array OWF, Arklow Bank OWF Phase 2 and to a lesser extent NISA OWF from this Visual Receptor Group consisting of high points in the landscape. During operation (night-time), given a cumulative baseline where the effects of the lighting of the CWP Project’s offshore infrastructure are added to those resulting from the lighting of NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, the CWP Project’s offshore infrastructure would not have an increased effect on this visual receptor group. The resultant magnitude of change would be **Low–negligible** (small–negligible in scale, long term and intermediate / localised in terms of geographical extent). The significance of effect would be **Not significant** (not significant).
864. **Visual Receptor Group 8 Wicklow Head to Brittas Bay** has been assessed to be of **High–Medium** sensitivity. During operation (night-time), the magnitude of change has been assessed as **Medium–Low** and the resultant effects of the CWP Project ‘alone’ have been assessed to be **Moderate–Slight** (not significant). The cumulative ZTVs indicate that there would be the main combined visibility from this Visual Receptor Group would be visibility of Arklow Bank OWF Phase 2 with the CWP Project. During operation (night-time), given a cumulative baseline where the lighting of the CWP Project’s offshore infrastructure is added to the lighting of Arklow Bank OWF Phase 2, the lighting of the CWP Project’s offshore infrastructure would have a reduced effect on this visual receptor group due to the closer proximity of Arklow Bank OWF Phase 2. The resultant magnitude of change would be **Low** (small in scale, long term and intermediate in terms of geographical extent). The significance of effect would be **Slight** (not significant).
865. **Visual Receptor Group 9 Marine Recreational Receptors** has been assessed to be of **High–Medium** sensitivity. During operation (night-time), the magnitude of change has been assessed as **Medium** and the resultant effects of the CWP Project ‘alone’ have been assessed to be **Significant**

(not significant). The cumulative ZTVs indicate that during operation (night-time) there would be potential for combined visibility from this Visual Receptor Group with NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2. During operation (night-time), given a cumulative baseline where the lighting of the CWP Project's offshore infrastructure is added to the lighting of NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, the lighting of the CWP Project's offshore infrastructure would not have an increased effect on this Visual Receptor Group. The resultant magnitude of change would be **Medium** (medium in scale, long term and wide in terms of geographical extent). The significance of effect would be **Moderate** (not significant).

Main (named) settlements

866. The following main (named) settlements have been assessed in **Chapter 15 Seascape, Landscape & Visual Impact Assessment** as having potential effects of **Slight** significance or above during operation (night-time):
- Killiney (covering Shankill to the south);
 - Bray;
 - Greystones;
 - Kilcoole;
 - Newcastle;
 - Wicklow; and
 - Arklow.
867. **Killiney** (covering Shankill to the south) has been assessed to be of **High-Medium** sensitivity. During operation (night-time), the magnitude of change has been assessed as **Low** and the resultant effects of the CWP Project 'alone' have been assessed to be **Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2 from locations within Killiney, with Dublin Array OWF located slightly closer to this settlement than the CWP Project. During operation (night-time), given a cumulative baseline where the lighting of the CWP Project's offshore infrastructure is added to the lighting of NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, the lighting of the CWP Project's offshore infrastructure would have a slightly reduced effect in views from the settlement due to the closer proximity of Dublin Array OWF. The resultant magnitude of change would be **Low** (small in scale, long term and localised in terms of geographical extent). The significance of effect would be **Slight** (not significant).
868. **Bray** has been assessed to be of **High-Medium** sensitivity. During operation (night-time), the magnitude of change has been assessed as **Low** and the resultant effects of the CWP Project 'alone' have been assessed to be **Slight** (not significant). The cumulative ZTVs indicate that there is most likely to be visibility of NISA OWF and Dublin Array OWF from locations within Bray, with Dublin Array OWF located slightly closer to this settlement than the CWP Project. During operation (night-time), given a cumulative baseline where the lighting of the CWP Project's offshore infrastructure is added to the lighting of NISA OWF and Dublin Array OWF, the CWP Project would have a slightly reduced effect in views from the settlement due to the closer proximity of Dublin Array OWF. The resultant magnitude of change would be **Low** (small in scale, long term and intermediate in terms of geographical extent). The significance of effect would be **Slight** (not significant).
869. **Greystones** has been assessed to be of **High-Medium** sensitivity. During operation (night-time), the magnitude of change has been assessed as **Medium-Low** and the resultant effects of the CWP Project 'alone' have been assessed to be **Moderate-Slight** (not significant). The cumulative ZTVs indicate that there is mostly likely to be visibility of NISA OWF and Dublin Array OWF from locations within Greystones, with Dublin Array OWF located slightly closer to this settlement than the CWP Project. During operation (night-time), given a cumulative baseline where the lighting of the CWP Project's offshore infrastructure is added to the lighting of NISA OWF and Dublin Array OWF, the

lighting of the CWP Project would have a slightly reduced effect in views from the settlement due to the closer proximity of Dublin Array OWF. The resultant magnitude of change would be **Medium–Low** (medium–small in scale, long term and wide in terms of geographical extent). The significance of effect would be **Moderate–Slight** (not significant).

870. **Kilcoole** has been assessed to be of **High–Medium** sensitivity. During operation (night-time), the magnitude of change has been assessed as **Medium–Low** and the resultant effects of the CWP Project ‘alone’ have been assessed to be **Moderate–Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2 from locations within Kilcoole. During operation (night-time), given a cumulative baseline where the lighting of the CWP Project’s offshore infrastructure is added to the lighting of Dublin Array OWF, the lighting of the CWP Project would be further from the viewpoint than the lighting of Dublin Array OWF. The resultant magnitude of change would be **Medium–Low** (medium–small in scale, long term and wide in terms of geographical extent). The significance of effect would be **Moderate–Slight** (not significant).
871. **Newcastle** has been assessed to be of **High–Medium** sensitivity. During operation (night-time), the magnitude of change has been assessed as **Low** and the resultant effects of the CWP Project ‘alone’ have been assessed to be **Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2 from locations within Newcastle. During operation (night-time), given a cumulative baseline where the lighting of the CWP Project’s offshore infrastructure is added to NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, the lighting of the CWP Project would be seen at a similar distance to the lighting of Dublin Array OWF and Arklow Bank OWF Phase 2, with all three OWFs visually separated. The resultant magnitude of change would be **Low** (small–negligible in scale, long term and wide in terms of geographical extent). The significance of effect would be **Slight** (not significant).
872. **Wicklow** has been assessed to be of **High–Medium** sensitivity. During operation (night-time), the magnitude of change has been assessed as **Medium–Low** and the resultant effects of the CWP Project ‘alone’ have been assessed to be **Moderate–Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2 from locations within Wicklow. During operation (night-time), given a cumulative baseline where the lighting of the CWP Project’s offshore infrastructure is added to NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, the CWP Project would be closer to the viewpoint than Dublin Array OWF. The resultant magnitude of change would be **Medium–Low** (medium– small in scale, long term and intermediate in terms of geographical extent). The significance of effect would be **Moderate–Slight** (not significant).
873. **Arklow** has been assessed to be of **High–Medium** sensitivity. During operation (night-time), the magnitude of change has been assessed as **Low** and the resultant effects of the CWP Project ‘alone’ have been assessed to be **Slight** (not significant). The cumulative ZTVs indicate that the main visibility would be of Arklow Bank OWF Phase 2 from locations within Arklow, around the operational Arklow Bank OWF Phase 1 and extending slightly in front of the CWP Project. During operation (night-time), given a cumulative baseline where the effects of the CWP Project’s offshore infrastructure are added to Arklow Bank OWF Phase 2, the CWP Project’s offshore infrastructure would have a slightly reduced effect in views from the settlement due to the closer proximity of Arklow Bank OWF Phase 2. The resultant magnitude of change would be **Low** (small in scale, long term and localised in terms of geographical extent). The significance of effect would be **Slight** (not significant).

Key routes

874. The following key routes have been assessed in **Chapter 15 SLVIA** as having potential impacts of **Slight** significance or above during operation (night-time):

- R131 Road;
- R119 Road;
- R761 Road;
- M11 / N11 Road;
- R750 Road;
- DART Line (Dublin to Greystones) / Dublin to Rosslare Main Line (Greystones to Wicklow)
- Southern Sea approach to Dublin Port (Dublin to Cherbourg);
- Bray–Greystone Coastal Walk;
- Greystone to Wicklow Trail; and
- The Wicklow Way.

875. **R131 Road** has been assessed to be of **Medium** sensitivity. During operation (night-time), the magnitude of change has been assessed as **Low** and the resultant effects of the CWP Project ‘alone’ have been assessed as **Slight** (not significant). The cumulative ZTVs indicate that there would be potential visibility of the lighting of NISA OWF and Dublin Array OWF from locations along the R131, with the lighting of Dublin Array OWF located closer to the road than lighting of the CWP Project. During operation (night-time), given a cumulative baseline where the effects of the CWP Project’s offshore infrastructure are added to those resulting from NISA OWF and Dublin Array OWF, the CWP Project would have a reduced effect on users of this road due to the closer proximity of Dublin Array OWF. The resultant magnitude of change would be **Negligible** (negligible in scale, long term and localised in terms of geographical extent). The significance of effect would be **Not Significant** (not significant).
876. **R119 Road** has been assessed to be of **Medium** sensitivity. During operation (night-time), the magnitude of change has been assessed as **Low** and the resultant effects of the CWP Project ‘alone’ have been assessed to be **Slight** (not significant) for section b (Dalkey / Sorrento Point to Shankill / Ballybrack (Seafield Road)). The cumulative ZTVs indicate that there would be intermittent visibility of NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2 from locations along section b of the R119, with the lighting of Dublin Array OWF located closer to the road than lighting of the CWP Project. During operation (night-time), given a cumulative baseline where the effects of the CWP Project’s offshore infrastructure are added to those resulting from NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, the CWP Project would have a reduced effect on users of this road due to the closer proximity of Dublin Array OWF. The resultant magnitude of change would be **Low** (small in scale, long term and intermediate / localised in terms of geographical extent). The significance of effect would be **Not Significant** (not significant).
877. **R761 Road** has been assessed to be of **Medium** sensitivity. During operation (night-time), the magnitude of change has been assessed as **Low** and the resultant effects of the CWP Project ‘alone’ have been assessed as **Slight** (not significant) overall and for section b (southern edge of Bray to north edge of Greystones), section c (southern edge of Greystones to northern edge of Newcastle (with no visibility through Kilcoole) and Section d (southern edge of Newcastle to Rathnew). The cumulative ZTVs indicate that there would be visibility of the lighting of Dublin Array OWF and Arklow Bank OWF Phase 2 from much of the R761, with intermittent visibility of the lighting of NISA OWF. At the northern end of the R761, the lighting of Dublin Array OWF located closer to the road than lighting of the CWP Project. During operation (night-time), given a cumulative baseline where the effects of the CWP Project’s offshore infrastructure are added to those resulting from Dublin Array OWF and Arklow Bank OWF Phase 2, the CWP Project would have a reduced effect on users of this road due to the closer proximity of Dublin Array OWF. The resultant magnitude of change for the road as a whole and sections b–d would remain **Low** (small in scale, long term and intermediate / localised in terms of geographical extent). The significance of effect would be **Slight** (not significant).
878. **M11 / N11** has been assessed to be of **Medium** sensitivity. During operation (night-time), the magnitude of change has been assessed as **Low** and the resultant effects of the CWP Project ‘alone’ have been assessed as **Slight** (not significant) for section b (from Delgany (west of Greystones) to

Junction 17 (southwest of Wicklow)). The cumulative ZTVs indicate that there would be intermittent visibility of the lighting of Dublin Array OWF and Arklow Bank OWF Phase 2 from stretches of the M11 / N11, with more limited visibility of the lighting of NISA OWF from the north of the M11 / N11. For much of the M11 / N11, the OWFs would appear in different areas of the view to the CWP Project. During operation (night-time), given a cumulative baseline where the effects of the CWP Project's offshore infrastructure are added to those resulting from Dublin Array OWF, Arklow Bank OWF Phase 2 and NISA OWF, the CWP Project would be visually separated from the other OWFs. The resultant magnitude of change for section b would remain **Low** (small in scale, long term and localised in terms of geographical extent). The significance of effect would be **Slight** (not significant).

879. **R750 Road** has been assessed to be of **High-Medium** sensitivity. During operation (night-time), the magnitude of change has been assessed as **Medium-Low** and the resultant effects of the CWP Project 'alone' have been assessed as **Moderate-Slight** (not significant) overall with variations for section b (Brittas to Mizen Head) of **Moderate-Slight** (not significant) and for section d **Slight** (not significant) (Ennereilly (just south of Sallymount) to Aisling / Seabank). The cumulative ZTVs indicate that there would be visibility of the lighting at Arklow Bank OWF Phase 2 from sections of the R750 and occasional visibility of the lighting at Dublin Array OWF, with the lighting at Arklow Bank OWF Phase 2 located closer to the road than lighting of the CWP Project. During operation (night-time), given a cumulative baseline where the effects of the CWP Project's offshore infrastructure are added to those resulting from Dublin Array OWF and Arklow Bank OWF Phase 2, the CWP Project would have a reduced effect on users of this road due to the closer proximity of Arklow Bank OWF Phase 2. The resultant magnitude of change for the route overall and for sections b and d would be **Low** (small in scale, long term and intermediate in terms of geographical extent). The significance of effect would be **Slight** (not significant).
880. **DART Line (Dublin to Greystones) / Dublin to Rosslare Main Line (Greystones to Wicklow)** has been assessed to be of **Medium** sensitivity. During operation (night-time), the magnitude of change has been assessed as **Medium-Low** and the resultant effects of the CWP Project 'alone' have been assessed as **Slight** (not significant) for section d (Bray Head to Wicklow). The cumulative ZTVs indicate that there would be intermittent visibility of the lighting of NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2 from locations along the length of the DART line. At various points along the route, the lighting of Dublin Array OWF or Arklow Bank OWF Phase 2 would be located closer to the DART line than lighting of the CWP Project, but for section d the CWP Project would remain the closest OWF. During operation (night-time), given a cumulative baseline where the effects of the CWP Project's offshore infrastructure are added to those resulting from NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, the CWP Project would have a reduced effect on users of this route due to the closer proximity of Dublin Array OWF or Arklow Bank OWF Phase 2. The resultant magnitude of change for section d would remain **Medium-Low** (medium-small in scale, long term and intermediate in terms of geographical extent). The significance of effect would be **Slight** (not significant).
881. **Southern Approach to approach to Dublin Port (Dublin to Cherbourg)** has been assessed to be of **Medium** sensitivity. During operation (night-time), the magnitude of change has been assessed as **Medium-Low** and the resultant effects of the CWP Project 'alone' have been assessed as **Slight** (not significant) overall with variations along sections of the route; section a) (0–10 km) **Moderate or Moderate-Slight** (not significant) and section b) (10–20 km) **Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of the lighting at Dublin Array OWF and Arklow Bank OWF Phase 2 from this ferry route, with lighting at NISA OWF likely to be visible north of the CWP Project. At various points along the route, the lighting at Dublin Array OWF or Arklow Bank OWF Phase 2 would be located closer to the ferry route than the lighting of the CWP Project. During operation (night-time), given a cumulative baseline where the effects of the CWP Project's offshore infrastructure are added to those resulting from NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, the CWP Project would have a reduced effect on the DART line due to the closer proximity of Dublin Array OWF or Arklow Bank OWF Phase 2. The resultant magnitude of change for both section b, where

Arklow Bank OWF Phase 2 would be closer to the ferry route, and the overall route would be **Low** (small in scale, long term and localised in terms of geographical extent). The significance of effect would be **Slight** (not significant). The resultant magnitude of change for section a would remain **Medium** (medium in scale, long term and wide in terms of geographical extent). The significance of effect would be **Moderate / Moderate-Slight** (not significant).

882. **Bray–Greystones Cliff Walk** has been assessed to be of **High–Medium** sensitivity. During operation (night-time), the magnitude of change has been assessed as **Medium–Low** and the resultant effects of the CWP Project ‘alone’ have been assessed as **Moderate–Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of the lighting at NISA OWF and Dublin Array OWF from the Cliff Walk, with intermittent visibility of the lighting at Arklow Bank OWF Phase 2. The lighting at Dublin Array OWF would be located closer to the Cliff Walk than lighting at the CWP Project. During operation (nighttime), given a cumulative baseline where the effects of the CWP Project’s offshore infrastructure are added to those resulting from NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, the CWP Project would have a reduced effect on the Bray–Greystones Cliff Walk due to the closer proximity of Dublin Array OWF. The resultant magnitude of change would be **Low** (small in scale, long term and wide / intermediate in terms of geographical extent). The significance of effect would be **Slight** (not significant).
883. **Greystones to Wicklow Trail** has been assessed to be of **High–Medium** sensitivity. During operation (night-time), the magnitude of change has been assessed as **Medium–Low** and the resultant effects of the CWP Project ‘alone’ have been assessed as **Moderate–Slight** (not significant). The cumulative ZTVs indicate that there would be visibility of the lighting at NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2 from most of the Trail. The lighting at Dublin Array OWF would be located closer to the Trail than lighting at the CWP Project at the northern end of the route. During operation (night-time), given a cumulative baseline where the effects of the CWP Project’s offshore infrastructure are added to those resulting from NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, the CWP Project would have a reduced effect on the Trail due to the closer proximity of Dublin Array OWF. The resultant magnitude of change for the route would remain **Medium–Low** (medium–small in scale, long term and intermediate in terms of geographical extent). The significance of effect would be **Moderate–Slight** (not significant).
884. **The Wicklow Way** has been assessed to be of **High–Medium** sensitivity. During operation (night-time), the magnitude of change has been assessed as **Low** and the resultant effects of the CWP Project ‘alone’ have been assessed as **Slight** (not significant) for sections c (from Ride Rock to White Hill on the eastern slopes of Djouce Mountain) and section d (Ballinastoe Woods through to Laragh East). The cumulative ZTVs indicate that there would be intermittent visibility of the lighting at NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2 from locations along the length of the Wicklow Way. For much of the Wicklow Way, the OWFs would appear in different areas of the view to the CWP Project. During operation (night-time), given a cumulative baseline where the effects of the CWP Project’s offshore infrastructure are added to those resulting from NISA OWF, Dublin Array OWF and Arklow Bank OWF Phase 2, the CWP Project would be visually separated from the other OWFs. The resultant magnitude of change for sections c and d would remain **Low** (small in scale, long term and localised in terms of geographical extent). The significance of effect would be **Slight** (not significant).
885. The SLVIA assessors judged that the CWP Project’s offshore infrastructure ‘alone’ would have no significant cumulative adverse effects during operation / maintenance (nighttime).

13.6 CEA summary

886. This CEA, which supports EIAR **Volume 3, Chapter 15 SLVIA** has assessed the potential cumulative effects on SLVIA from the construction and operation and maintenance phases of the CWP Project alongside other development.
887. **Table 13-4** below has been adopted from the PINS advice on CEA for NSIPs (PINS, 2024) as a means of summarising the potential adverse or beneficial cumulative effects of the CWP Project with other development. It summarises the outcomes of the detailed assessment provided above and sets out the proposed mitigation measures needed to address cumulative effects, if deemed necessary. In summary, the CEA for SLVIA identified the following significant cumulative effects resulting from the CWP Project alongside other development.

13.6.1 Seascape / Landscape Townscape and National Designated Landscapes

888. **Seascape:** There would be no significant adverse cumulative effects on RSCA associated with cumulative impacts 1 to 4 where the effects of the CWP Project's offshore infrastructure are added to the other proposed OWFs.
889. **Landscape / Townscape Character:** During operation (daytime) **LA 2a. Northern Coastal Area** as identified in the Wicklow County Council Landscape Assessment would experience **Significant** adverse (significant) cumulative effects.
890. No significant adverse cumulative effects would be experienced for the remaining phases of construction (daytime and night-time) and operation (night-time) (cumulative Impacts 1, 2 and 4) where the effects of the CWP Project's offshore infrastructure are added to the other proposed OWFs.
891. **National Designated Landscapes:** During operation (daytime) **Bray Head SAA** would experience **Significant** adverse (significant) cumulative effects. Bray Head SAA would not experience significant adverse cumulative effects for Impact 1, 2 and 4 where the effects of the CWP Project's offshore infrastructure are added to the other proposed OWFs.
892. There would be no significant adverse cumulative effects on other nationally designated landscapes associated with cumulative impacts 1 to 4 where the effects of the CWP Project's offshore infrastructure are added to the other proposed OWFs.

13.6.2 Visual Amenity (Visual Receptor Groups, Main (Named Settlements) and Key Routes)

Visual Receptor Groups:

893. Where the effects of the CWP Project's offshore infrastructure are added to the other proposed OWFs:
- During operation (daytime) Visual Receptor Group 4 Cliff Manor, Greystones, Kilcoole to Five Mile Point; Visual Receptor Group 5 Wicklow to Wicklow Head and Visual Receptor Group 6 Dublin and Bray Mountains would experience Significant (significant) adverse cumulative effects.
 - During operation (daytime) Visual Receptor Group 9 Marine Recreational Receptors would experience Very Significant (significant) adverse cumulative effects.
894. No significant adverse cumulative effects would be experienced for remaining phases of construction / decommissioning (daytime and nighttime) and operation (nighttime) (Impacts 1, 2 and 4).

Main (Named) Settlements:

895. Where the effects of the CWP Project's offshore infrastructure are added to the other proposed OWFs:
- During operation (daytime) Greystones; and Wicklow would experience a Significant (significant) adverse cumulative effects.
 - During operation (daytime) Kilcoole would experience a Very Significant (significant) adverse cumulative effect.
896. For all remaining phases of development (cumulative impacts 1, 2 and 4) no significant adverse cumulative effects would be experienced.

Key Routes:

897. Where the effects of the CWP Project's offshore infrastructure are added to the other proposed OWFs:
- During operation (daytime) DART Line (Dublin to Greystones) / Dublin to Rosslare Main Line (Greystones to Wicklow): Receptors would experience a Significant–Moderate (significant) adverse cumulative effect for section d (Bray Head to Wicklow) of the route whilst for remaining sections of the route receptors would experience not significant effects.
 - During operation (daytime) Southern Approach to approach to Dublin Port (Dublin to Cherbourg): Receptors would experience Moderate or Significant–Moderate (significant) adverse cumulative effects for section a (0–10 km). The overall cumulative effect would be Slight adverse (not significant)..
 - During operation (daytime) Bray to Greystones Cliff Walk: Receptors utilising the route would experience a Significant (significant) adverse cumulative effect.
 - During operation (daytime) Greystones to Wicklow Trail: Receptors using the route would experience a Very Significant (significant) adverse cumulative effect.
898. For all remaining phases of development (cumulative impacts 1, 2 and 4) no significant adverse cumulative effects would be experienced.

Table 13-4 Summary of cumulative effects assessment

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
Construction phase				
Cumulative Impact 1: Direct / indirect temporary impacts on seascape / landscape / townscape, national designated landscapes and visual receptors.				
Seascape Receptors: R13 South Irish Sea Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA00037) NISA OWF (CEA-0094)	1	Slight adverse (not significant in EIA terms)	No additional mitigation required	Slight adverse (not significant in EIA terms)
R14 Irish Sea, Sandbank and Broad Bays Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA00037) NISA OWF (CEA-0094)	1	Slight adverse (not significant in EIA terms)	No additional mitigation required	Slight adverse (not significant in EIA terms)

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
Landscape / Townscape Character Receptors: LCA 10 Rathmichael LCA Dublin Array OW (CEA00037) NISA OWF (CEA-0094)	1	Not Significant adverse (not significant in EIA terms)	No additional mitigation required	Not Significant adverse (not significant in EIA terms)
LCA 11 Ballyman Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Slight adverse (not significant in EIA terms)	No additional mitigation required	Slight adverse (not significant in EIA terms)
LCA 12 Shanganagh Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Slight adverse (not significant in EIA terms)	No additional mitigation required	Slight adverse (not significant in EIA terms)

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
TCA 4 Dalkey Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Not Significant adverse (not significant in EIA terms)	No additional mitigation required	Not Significant adverse (not significant in EIA terms)
TCA 5 Dalkey Island Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Slight adverse (not significant in EIA terms)	No additional mitigation required	Slight adverse (not significant in EIA terms)
TCA 6 Killiney Bay Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037)	1	Not Significant adverse (not significant in EIA terms)	No additional mitigation required	Not Significant adverse (not significant in EIA terms)

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
TCA 7 Shankill Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Not Significant adverse (not significant in EIA terms)	No additional mitigation required	Not Significant adverse (not significant in EIA terms)
LA 1c The Bray Mountain Group Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Not Significant adverse (not significant in EIA terms)	No additional mitigation required	Not Significant adverse (not significant in EIA terms)
LCA 1d The North Eastern Valley Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Not Significant adverse (not significant in EIA terms)	No additional mitigation required	Not Significant adverse (not significant in EIA terms)

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
LA 2a Northern Coastal Area Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Moderate adverse (not significant in EIA terms)	No additional mitigation required	Moderate adverse (not significant in EIA terms)
LA 2b Southern Coastal Area Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037)	1	Slight adverse (not significant in EIA terms)	No additional mitigation required	Slight adverse (not significant in EIA terms)
LA 3a North East Mountain Lowlands Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Moderate-Slight adverse (not significant in EIA terms)	No additional mitigation required	Moderate-Slight adverse (not significant in EIA terms)

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
LA 3b South East Mountain Lowlands Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Not Significant adverse (not significant in EIA terms)	No additional mitigation required	Not Significant adverse (not significant in EIA terms)
TCA 6 Greystones Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Moderate-Slight adverse (not significant in EIA terms)	No additional mitigation required	Moderate-Slight adverse (not significant in EIA terms)
TCA 6b Kilcoole Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Slight adverse (not significant in EIA terms)	No additional mitigation required	Slight adverse (not significant in EIA terms)

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
TCA 6c Newcastle Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Slight adverse (not significant in EIA terms)	No additional mitigation required	Slight adverse (not significant in EIA terms)
TCA 6d Wicklow Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Slight adverse (not significant in EIA terms)	No additional mitigation required	Slight adverse (not significant in EIA terms)
National designated landscape receptor: Bray Head SAA: Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Not Significant adverse (not significant in EIA terms)	No additional mitigation required	Not Significant adverse (not significant in EIA terms)

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
Visual Receptor Groups: Visual Receptor Group 2 Killiney to Bray Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037)	1	Slight adverse (not significant in EIA terms)	No additional mitigation required	Slight adverse (not significant in EIA terms)
Visual Receptor Group 3 Bray Head to Cliff Manor Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Not Significant adverse (not significant in EIA terms)	No additional mitigation required	Not Significant adverse (not significant in EIA terms)
Visual Receptor Group 4 Cliff Manor, Greystones, Kilcoole to Five Mile Point Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037)	1	Moderate – Slight adverse (not significant in EIA terms)	No additional mitigation required	Moderate – Slight adverse (not significant in EIA terms)

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
NISA OWF (CEA-0094)				
Visual Receptor Group 5 Wicklow to Wicklow Head Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037)	1	Moderate adverse (not significant in EIA terms)	No additional mitigation required	Moderate adverse (not significant in EIA terms)
Visual Receptor Group 6 Dublin and Bray Mountains Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Not Significant adverse (not significant in EIA terms)	No additional mitigation required	Not Significant adverse (not significant in EIA terms)

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
Visual Receptor Group 7 Mountain Uplands Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Moderate – Slight adverse (not significant in EIA terms)	No additional mitigation required	Moderate – Slight adverse (not significant in EIA terms)
Visual Receptor Group 8 Wicklow Head to Brittas Bay Arklow Bank OWF Phase 2 (CEA0004)	1	Not Significant adverse (not significant in EIA terms)	No additional mitigation required	Not Significant adverse (not significant in EIA terms)
Visual Receptor Group 9 Marine Recreational Receptors Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Moderate adverse (not significant in EIA terms)	No additional mitigation required	Moderate adverse (not significant in EIA terms)

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
Main (Named)Settlements: Killiney Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Moderate – Slight adverse (not significant in EIA terms)	No additional mitigation required	Moderate – Slight adverse (not significant in EIA terms)
Bray Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Moderate-Slight adverse (not significant in EIA terms)]	No additional mitigation required	Moderate-Slight adverse (not significant in EIA terms)]
Greystones Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Moderate – Slight adverse (not significant in EIA terms)	No additional mitigation required	Moderate – Slight adverse (not significant in EIA terms)

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
Kilcoole Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Moderate adverse (not significant in EIA terms)	No additional mitigation required	Moderate adverse (not significant in EIA terms)
Wicklow Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Moderate adverse (not significant in EIA terms)	No additional mitigation required	Moderate adverse (not significant in EIA terms)
Key Routes: R119 Road Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Not Significant adverse (not significant in EIA terms)	No additional mitigation required	Not Significant adverse (not significant in EIA terms)

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
R750 Road Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037)	1	Not Significant adverse (not significant in EIA terms)	No additional mitigation required	Not Significant adverse (not significant in EIA terms)
DART Line (Dublin to Greystones / Dublin to Rosslare Main Line (Greystones to Wicklow) Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Moderate adverse (not significant in EIA terms)	No additional mitigation required	Moderate adverse (not significant in EIA terms)
Southern Sea approach to Dublin Port (Dublin to Cherbourg); Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Moderate / Moderate-Slight adverse (not significant in EIA terms)	No additional mitigation required	Moderate / Moderate-Slight adverse (not significant in EIA terms)

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
Bray–Greystone Coastal Walk Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Slight adverse (not significant in EIA terms)	No additional mitigation required	Slight adverse (not significant in EIA terms)
Greystone to Wicklow Trail Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Moderate adverse (not significant in EIA terms)	No additional mitigation required	Moderate adverse (not significant in EIA terms)
The Wicklow Way Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Slight adverse (not significant in EIA terms)	No additional mitigation required	Slight adverse (not significant in EIA terms)
Cumulative Impact 2: Direct / indirect temporary nighttime impacts on seascape / landscape and townscape / national designated landscapes and visual receptors.				

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
Seascope Receptors: R13 South Irish Sea Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Not Significant adverse (not significant in EIA terms)	No additional mitigation required	Not Significant adverse (not significant in EIA terms)
R14 Irish Sea, Sandbank and Broad Bays Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Slight adverse (not significant in EIA terms)	No additional mitigation required	Slight adverse (not significant in EIA terms)
Landscape / Townscape Character Receptors: LCA 10 Rathmichael LCA	1	Not Significant adverse (not significant in EIA terms)	No additional mitigation required	Not Significant adverse (not significant in EIA terms)

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
Dublin Array OW (CEA0037) NISA OWF (CEA-0094)				
LCA 11 Ballyman Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Not Significant adverse (not significant in EIA terms)	No additional mitigation required	Not Significant adverse (not significant in EIA terms)
LCA 12 Shanganagh Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Slight adverse (not significant in EIA terms)	No additional mitigation required	Slight adverse (not significant in EIA terms)
TCA 4 Dalkey Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Not Significant adverse (not significant in EIA terms)	No additional mitigation required	Not Significant adverse (not significant in EIA terms)

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
TCA 5 Dalkey Island Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Slight adverse (not significant in EIA terms)	No additional mitigation required	Slight adverse (not significant in EIA terms)
TCA 6 Killiney Bay Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037)	1	Not Significant adverse (not significant in EIA terms)	No additional mitigation required	Not Significant adverse (not significant in EIA terms)
TCA 7 Shankill Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Not Significant adverse (not significant in EIA terms)	No additional mitigation required	Not Significant adverse (not significant in EIA terms)

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
LA 1c The Bray Mountain Group Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Not Significant adverse (not significant in EIA terms)	No additional mitigation required	Not Significant adverse (not significant in EIA terms)
LCA 1d The North Eastern Valley Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Not Significant adverse (not significant in EIA terms)	No additional mitigation required	Not Significant adverse (not significant in EIA terms)
LA 2a Northern Coastal Area Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Moderate adverse (not significant in EIA terms)	No additional mitigation required	Moderate adverse (not significant in EIA terms)

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
LA 2b Southern Coastal Area Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037)	1	Slight adverse (not significant in EIA terms)	No additional mitigation required	Slight adverse (not significant in EIA terms)
LA 3a North East Mountain Lowlands Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Moderate – Slight adverse (not significant in EIA terms)	No additional mitigation required	Moderate – Slight adverse (not significant in EIA terms)
LA 3b South East Mountain Lowlands Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Not Significant adverse (not significant in EIA terms)	No additional mitigation required	Not Significant adverse (not significant in EIA terms)

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
TCA 6 Greystones Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Moderate – Slight adverse (not significant in EIA terms)	No additional mitigation required	Moderate – Slight adverse (not significant in EIA terms)
TCA 6b Kilcoole Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Slight adverse (not significant in EIA terms)	No additional mitigation required	Slight adverse (not significant in EIA terms)
TCA 6c Newcastle Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Slight adverse (not significant in EIA terms)	No additional mitigation required	Slight adverse (not significant in EIA terms)

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
TCA 6d Wicklow Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Moderate – Slight adverse (not significant in EIA terms)	No additional mitigation required	Moderate – Slight adverse (not significant in EIA terms)
National designated landscape receptors: Bray Head SAA: Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Not Significant adverse (not significant in EIA terms)	No additional mitigation required	Not Significant adverse (not significant in EIA terms)
Visual Receptor Groups: Visual Receptor Group 2 Killiney to Bray Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037)	1	Not Significant adverse (not significant in EIA terms)	No additional mitigation required	Not Significant adverse (not significant in EIA terms)

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
Visual Receptor Group 3 Bray Head to Cliff Manor Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Not Significant adverse (not significant in EIA terms)	No additional mitigation required	Not Significant adverse (not significant in EIA terms)
Visual Receptor Group 4 Cliff Manor, Greystones, Kilcoole to Five Mile Point Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Moderate – Slight adverse (not significant in EIA terms)	No additional mitigation required	Moderate – Slight adverse (not significant in EIA terms)

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
Visual Receptor Group 5 Wicklow to Wicklow Head Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037)	1	Moderate adverse (not significant in EIA terms)	No additional mitigation required	Moderate adverse (not significant in EIA terms)
Visual Receptor Group 6 Dublin and Bray Mountains Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Not Significant adverse (not significant in EIA terms)	No additional mitigation required	Not Significant adverse (not significant in EIA terms)
Visual Receptor Group 8 Wicklow Head to Brittas Bay Arklow Bank OWF Phase 2 (CEA0004)	1	Not Significant adverse (not significant in EIA terms)	No additional mitigation required	Not Significant adverse (not significant in EIA terms)

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
Visual Receptor Group 9 Marine Recreational Receptors Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Moderate adverse (not significant in EIA terms)	No additional mitigation required	Moderate adverse (not significant in EIA terms)
Main (Named) Settlements: Killiney Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Moderate – Slight adverse (not significant in EIA terms)	No additional mitigation required	Moderate – Slight adverse (not significant in EIA terms)
Bray Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Slight adverse (not significant in EIA terms)	No additional mitigation required	Slight adverse (not significant in EIA terms)

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
Greystones Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Moderate – Slight adverse (not significant in EIA terms)	No additional mitigation required	Moderate – Slight adverse (not significant in EIA terms)
Kilcoole Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Moderate adverse (not significant in EIA terms)	No additional mitigation required	Moderate adverse (not significant in EIA terms)
Wicklow Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Moderate adverse (not significant in EIA terms)	No additional mitigation required	Moderate adverse (not significant in EIA terms)

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
Arklow Arklow Bank OWF Phase 2 (CEA0004)	1	Not Significant adverse (not significant in EIA terms)	No additional mitigation required	Not Significant adverse (not significant in EIA terms)
Key Routes: R119 Road Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Not Significant adverse (not significant in EIA terms)	No additional mitigation required	Not Significant adverse (not significant in EIA terms)
R750 Road Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037)	1	Not Significant adverse (not significant in EIA terms)	No additional mitigation required	Not Significant adverse (not significant in EIA terms)

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
DART Line (Dublin to Greystones / Dublin to Rosslare Main Line (Greystones to Wicklow) Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Moderate adverse (not significant in EIA terms)	No additional mitigation required	Moderate adverse (not significant in EIA terms)
Southern Sea approach to Dublin Port (Dublin to Cherbourg); Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Moderate / Moderate-Slight adverse (not significant in EIA terms)	No additional mitigation required	Moderate / Moderate-Slight adverse (not significant in EIA terms)
Bray–Greystone Coastal Walk Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037)	1	Not Significant adverse (not significant in EIA terms)	No additional mitigation required	Not Significant adverse (not significant in EIA terms)

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
NISA OWF (CEA-0094)				
Greystone to Wicklow Trail Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Moderate – Slight adverse (not significant in EIA terms)	No additional mitigation required	Moderate – Slight adverse (not significant in EIA terms)
The Wicklow Way Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Slight adverse (not significant in EIA terms)	No additional mitigation required	Slight adverse (not significant in EIA terms)

Operation and maintenance phase

Cumulative Impact 3: Direct / indirect long term though reversible impacts on seascape / landscape and townscapes / national designated landscapes and visual receptors.

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
Seascope Receptors: R13 South Irish Sea Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Slight adverse (not significant in EIA terms)	No additional mitigation required	Slight adverse (not significant in EIA terms)
R14 Irish Sea, Sandbank and Broad Bays Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Moderate adverse (not significant in EIA terms)	No additional mitigation required	Moderate adverse (not significant in EIA terms)
RSC 15 Dublin Bay Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037)	1	Not Significant adverse (not significant in EIA terms)	No additional mitigation required	Not Significant adverse (not significant in EIA terms)

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
NISA OWF (CEA-0094)				
RSC16 North Eastern Irish Seas Islands and Beaches	1	Not Significant adverse (not significant in EIA terms)	No additional mitigation required	Not Significant adverse (not significant in EIA terms)
Dublin Array OW (CEA0037) NISA OWF (CEA-0094)				
Landscape / Townscape Character Receptors:	1	Not Significant adverse (not significant in EIA terms)	No additional mitigation required	Not Significant adverse (not significant in EIA terms)
LCA 1d Howth LCA				
Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)				
LCA 1e Ireland's Eye LCA	1	Not Significant adverse (not significant in EIA terms)	No additional mitigation required	Not Significant adverse (not significant in EIA terms)
Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)				

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
LCA 1f Lambay Island Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Not Significant adverse (not significant in EIA terms)	No additional mitigation required	Not Significant adverse (not significant in EIA terms)
TCA 6 North Bull Island Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Not Significant adverse (not significant in EIA terms)	No additional mitigation required	Not Significant adverse (not significant in EIA terms)
TCA 8 Sandymount Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Not Significant adverse (not significant in EIA terms)	No additional mitigation required	Not Significant adverse (not significant in EIA terms)
TCA 10 St Annes Park Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Not Significant adverse (not significant in EIA terms)	No additional mitigation required	Not Significant adverse (not significant in EIA terms)
LCA 5 Kiltiernan Plain LCA	1	Not Significant adverse (not significant in EIA terms)	No additional mitigation required	Not Significant adverse (not significant in EIA terms)

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
Dublin Array OW (CEA0037) NISA OWF (CEA-0094)				
LCA 6 Ballycorus LCA Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Not Significant adverse (not significant in EIA terms)	No additional mitigation required	Not Significant adverse (not significant in EIA terms)
LCA 7 Glencullen Valley LCA Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Not Significant adverse (not significant in EIA terms)	No additional mitigation required	Not Significant adverse (not significant in EIA terms)
LCA 8 Glendoo Valley LCA Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Not Significant adverse (not significant in EIA terms)	No additional mitigation required	Not Significant adverse (not significant in EIA terms)
LCA 10 Rathmichael LCA	1	Slight adverse (not significant in EIA terms)	No additional mitigation required	Slight adverse (not significant in EIA terms)

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
Dublin Array OW (CEA0037) NISA OWF (CEA-0094)				
LCA 11 Ballyman Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Slight adverse (not significant in EIA terms)	No additional mitigation required	Slight adverse (not significant in EIA terms)
LCA 12 Shanganagh Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Moderate-Slight adverse (not significant in EIA terms)	No additional mitigation required	Moderate-Slight adverse (not significant in EIA terms)
TCA 2 Dun Laoghaire / Monkstown Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Not Significant adverse (not significant in EIA terms)	No additional mitigation required	Not Significant adverse (not significant in EIA terms)
TCA 4 Dalkey Dublin Array OW (CEA0037)	1	Not Significant adverse (not significant in EIA terms)	No additional mitigation required	Not Significant adverse (not significant in EIA terms)

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
NISA OWF (CEA-0094)				
TCA 5 Dalkey Island Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Moderate adverse (not significant in EIA terms)	No additional mitigation required	Moderate adverse (not significant in EIA terms)
TCA 6 Killiney Bay Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037)	1	Moderate adverse (not significant in EIA terms)	No additional mitigation required	Moderate adverse (not significant in EIA terms)
TCA 7 Shankill Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Slight adverse (not significant in EIA terms)	No additional mitigation required	Slight adverse (not significant in EIA terms)
LA 1a. The Mountain Uplands (AONB)	1	Moderate-Slight adverse (not significant in EIA terms)	No additional mitigation required	Moderate-Slight adverse (not significant in EIA terms)

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)				
LA 1c The Bray Mountain Group Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Moderate-Slight adverse (not significant in EIA terms)	No additional mitigation required	Moderate-Slight adverse (not significant in EIA terms)
LCA 1d The North Eastern Valley Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Moderate-Slight adverse (not significant in EIA terms)	No additional mitigation required	Moderate-Slight adverse (not significant in EIA terms)
LA 2a Northern Coastal Area Arklow Bank OWF Phase 2 (CEA0004)	1	Significant adverse (significant in EIA terms)	No additional mitigation required	Significant adverse (significant in EIA terms)

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
Dublin Array OW (CEA0037) NISA OWF (CEA-0094)				
LA 2b Southern Coastal Area Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037)	1	Moderate adverse (not significant in EIA terms)	No additional mitigation required	Moderate adverse (not significant in EIA terms)
LA 3a North East Mountain Lowlands Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Moderate adverse (not significant in EIA terms)	No additional mitigation required	Moderate- adverse (not significant in EIA terms)
LA 3b South East Mountain Lowlands Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037)	1	Moderate-Slight adverse (not significant in EIA terms)	No additional mitigation required	Moderate-Slight adverse (not significant in EIA terms)

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
NISA OWF (CEA-0094)				
LA 3c. Southern Hills Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Slight adverse (not significant in EIA terms)	No additional mitigation required	Slight adverse (not significant in EIA terms)
LA 4a. N11 Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Slight adverse (not significant in EIA terms)]	No additional mitigation required	Slight adverse (not significant in EIA terms)
LA 5 Rolling Lowlands Areas 1-6 Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037)	1	Not Significant adverse (not significant in EIA terms)	No additional mitigation required	Not Significant adverse (not significant in EIA terms)
TCA 6 Greystones	1	Moderate adverse (not significant in EIA terms)	No additional mitigation required	Moderate adverse (not significant in EIA terms)

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)				
TCA 6b Kilcoole Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Slight adverse (not significant in EIA terms)	No additional mitigation required	Slight adverse (not significant in EIA terms)
TCA 6c Newcastle Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Slight adverse (not significant in EIA terms)	No additional mitigation required	Slight adverse (not significant in EIA terms)
TCA 6d Wicklow Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037)	1	Moderate adverse (not significant in EIA terms)	No additional mitigation required	Moderate adverse (not significant in EIA terms)

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
NISA OWF (CEA-0094)				
LCU 1. Uplands Arklow Bank OWF Phase 2 (CEA0004)	1	Not Significant adverse (not significant in EIA terms)	No additional mitigation required	Not Significant adverse (not significant in EIA terms)
LCU 2. Lowlands Arklow Bank OWF Phase 2 (CEA0004)	1	Slight adverse (not significant in EIA terms)	No additional mitigation required	Slight adverse (not significant in EIA terms)
LCU 4. Coastal Arklow Bank OWF Phase 2 (CEA0004)	1	Not Significant adverse (not significant in EIA terms)	No additional mitigation required	Not Significant adverse (not significant in EIA terms)
LCU 5. Distinctive - 5A Kilmichael Point Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037)	1	Not Significant adverse (not significant in EIA terms)	No additional mitigation required	Not Significant adverse (not significant in EIA terms)
LCU 5. Distinctive - 5b Ask Hill, 5c Tara Hill, 5d Ballyminaun	1	Not Significant adverse (not significant in EIA terms)	No additional mitigation required	Not Significant adverse (not significant in EIA terms)

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037)				
National designated landscape receptor: Nowth Head SAA: Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Slight adverse (not significant in EIA terms)	No additional mitigation required	Slight adverse (not significant in EIA terms)
North Bull Island SAA Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Slight adverse (not significant in EIA terms)	No additional mitigation required	Slight adverse (not significant in EIA terms)
Bray Head SAA: Arklow Bank OWF Phase 2 (CEA0004)	1	Significant adverse (significant in EIA terms)	No additional mitigation required	Significant adverse (significant in EIA terms)

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
Dublin Array OW (CEA0037) NISA OWF (CEA-0094)				
Visual Receptor Groups: Visual Receptor Group 1 Howth Head to North Bull Island Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Moderate-Slight adverse (not significant in EIA terms)	No additional mitigation required	Moderate-Slight adverse (not significant in EIA terms)
Visual Receptor Group 2 Killiney to Bray Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Moderate-Slight adverse (not significant in EIA terms)	No additional mitigation required	Moderate-Slight adverse (not significant in EIA terms)
Visual Receptor Group 3 Bray Head to Cliff Manor Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037)	1	Moderate adverse (not significant in EIA terms)	No additional mitigation required	Moderate adverse (not significant in EIA terms)

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
NISA OWF (CEA-0094)				
Visual Receptor Group 4 Cliff Manor, Greystones, Kilcoole to Five Mile Point Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Significant adverse (significant in EIA terms)	No additional mitigation required	Significant adverse (significant in EIA terms)
Visual Receptor Group 5 Wicklow to Wicklow Head Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037)	1	Significant adverse (significant in EIA terms)	No additional mitigation required	Significant adverse (significant in EIA terms)
Visual Receptor Group 6 Dublin and Bray Mountains Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Significant adverse (significant in EIA terms)	No additional mitigation required	Significant adverse (significant in EIA terms)

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
Visual Receptor Group 7 Mountain Uplands Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Moderate adverse (not significant in EIA terms)	No additional mitigation required	Moderate adverse (not significant in EIA terms)
Visual Receptor Group 8 Wicklow Head to Brittas Bay Arklow Bank OWF Phase 2 (CEA0004)	1	Moderate adverse (not significant in EIA terms)	No additional mitigation required	Moderate adverse (not significant in EIA terms)
Visual Receptor Group 9 Marine Recreational Receptors Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Very Significant adverse (significant in EIA terms)	No additional mitigation required	Very Significant adverse (significant in EIA terms)
Main (Named) Settlements:	1	Slight adverse (not significant in EIA terms)	No additional mitigation required	Slight adverse (not significant in EIA terms)

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
Dublin and its coastal suburbs including Merrion in the south and Baldoyle in the north Dublin Array OW (CEA0037) NISA OWF (CEA-0094)				
Dun Laoghaire and adjacent settlements, including Booterstown, Blackrock, Monkstown to the north of the Harbour and Sandycove and Dalkey to the south of the harbour Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Slight adverse (not significant in EIA terms)	No additional mitigation required	Slight adverse (not significant in EIA terms)
Killiney (covering Shankill to the south) Arklow Bank OWF Phase 2 (CEA0004)	1	Moderate – Slight adverse (not significant in EIA terms)	No additional mitigation required	Moderate – Slight adverse (not significant in EIA terms)

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
Dublin Array OW (CEA0037) NISA OWF (CEA-0094)				
Bray Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Moderate-Slight adverse (not significant in EIA terms)	No additional mitigation required	Moderate-Slight adverse (not significant in EIA terms)
Greystones Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Significant adverse (significant in EIA terms)	No additional mitigation required	Significant adverse (significant in EIA terms)
Kilcoole Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Very Significant adverse (significant in EIA terms)	No additional mitigation required	Very Significant adverse (significant in EIA terms)
Newcastle Arklow Bank OWF Phase 2 (CEA0004)	1	Slight adverse (not significant in EIA terms)	No additional mitigation required	Slight adverse (not significant in EIA terms)

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
Dublin Array OW (CEA0037) NISA OWF (CEA-0094)				
Newton Mount Kennedy Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037)	1	Slight adverse (not significant in EIA terms)	No additional mitigation required	Slight adverse (not significant in EIA terms)
Wicklow Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Significant adverse (significant in EIA terms)	No additional mitigation required	Significant adverse (significant in EIA terms)
Arklow Arklow Bank OWF Phase 2 (CEA0004)	1	Slight adverse (not significant in EIA terms)	No additional mitigation required	Slight adverse (not significant in EIA terms)
Key Routes: R105 Road	1	Slight adverse (not significant in EIA terms)	No additional mitigation required	Slight adverse (not significant in EIA terms)

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
Dublin Array OW (CEA0037) NISA OWF (CEA-0094)				
R807 Road Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Not Significant adverse (not significant in EIA terms)	No additional mitigation required	Not Significant adverse (not significant in EIA terms)
R131 Road Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Not Significant adverse (not significant in EIA terms)	No additional mitigation required	Not Significant adverse (not significant in EIA terms)
R119 Road Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Slight adverse (not significant in EIA terms)	No additional mitigation required	Slight adverse (not significant in EIA terms)
R761 Road Arklow Bank OWF Phase 2 (CEA0004)	1	Slight adverse (not significant in EIA terms)	No additional mitigation required	Slight adverse (not significant in EIA terms)

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
Dublin Array OW (CEA0037) NISA OWF (CEA-0094)				
M11/ N11 Road Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Slight adverse (not significant in EIA terms)	No additional mitigation required	Slight adverse (not significant in EIA terms)
R750 Road Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037)	1	Moderate-Slight/Slight adverse (not significant in EIA terms)	No additional mitigation required	Moderate-Slight/Slight adverse (not significant in EIA terms)
DART Line (Dublin to Greystones / Dublin to Rosslare Main Line (Greystones to Wicklow) Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Significant -Moderate (significant) / Slight adverse (not significant in EIA terms)	No additional mitigation required	Significant -Moderate (significant) / Slight adverse (not significant in EIA terms)

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
Northern Sea approach to Dublin Port (Liverpool to Dublin); Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Slight adverse (not significant in EIA terms)	No additional mitigation required	Slight adverse (not significant in EIA terms)
Southern Sea approach to Dublin Port (Dublin to Cherbourg) Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Significant-Moderate – Moderate adverse (Significant) / Moderate adverse (not significant) / Slight adverse (not significant in EIA terms)	No additional mitigation required	Significant-Moderate – Moderate adverse (Significant) / Moderate adverse (not significant) / Slight adverse (not significant in EIA terms)
Howth Head Loop Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Moderate- Slight adverse (not significant in EIA terms)	No additional mitigation required	Moderate-Slight adverse (not significant in EIA terms)

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
North Bull Wall Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Moderate- Slight adverse (not significant in EIA terms)	No additional mitigation required	Moderate-Slight adverse (not significant in EIA terms)
Great South Wall Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Slight adverse (not significant in EIA terms)	No additional mitigation required	Slight adverse (not significant in EIA terms)
Bray–Greystone Cliff Walk Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Significant adverse (significant in EIA terms)	No additional mitigation required	Significant adverse (significant in EIA terms)
Greystone to Wicklow Trail Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Very Significant adverse (significant in EIA terms)	No additional mitigation required	Very Significant adverse (significant in EIA terms)

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
The Wicklow Way Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Moderate adverse (not significant in EIA terms)	No additional mitigation required	Moderate adverse (not significant in EIA terms)
Cumulative Impact 4: Direct / indirect long term though reversible nighttime impacts on / seascape / landscape and townscape / national designated landscapes and visual receptors				
Seascape Receptors: R13 South Irish Sea Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Not Significant adverse (not significant in EIA terms)	No additional mitigation required	Not Significant adverse (not significant in EIA terms)
R14 Irish Sea, Sandbank and Broad Bays Arklow Bank OWF Phase 2 (CEA0004)	1	Slight adverse (not significant in EIA terms)	No additional mitigation required	Slight adverse (not significant in EIA terms)

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
Dublin Array OW (CEA0037) NISA OWF (CEA-0094)				
Landscape / Townscape Character Receptors: LCA 10 Rathmichael LCA Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Slight adverse (not significant in EIA terms)]	No additional mitigation required	Slight adverse (not significant in EIA terms)]
LCA 11 Ballyman Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Not Significant adverse (not significant in EIA terms)	No additional mitigation required	Not Significant adverse (not significant in EIA terms)
LCA 12 Shanganagh Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Not Significant adverse (not significant in EIA terms)	No additional mitigation required	Not Significant adverse (not significant in EIA terms)
TCA 5 Dalkey Island	1	Not Significant adverse (not significant in EIA terms)	No additional mitigation required	Not Significant adverse (not significant in EIA terms)

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)				
TCA 6 Killiney Bay Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037)	1	Not Significant adverse (not significant in EIA terms)	No additional mitigation required	Not Significant adverse (not significant in EIA terms)
TCA 7 Shankill Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Not Significant adverse (not significant in EIA terms)	No additional mitigation required	Not Significant adverse (not significant in EIA terms)
LA 1c The Bray Mountain Group Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037)	1	Slight adverse (not significant in EIA terms)]	No additional mitigation required	Slight adverse (not significant in EIA terms)

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
NISA OWF (CEA-0094)				
LCA 1d The North Eastern Valley Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Moderate-Slight adverse (not significant in EIA terms)	No additional mitigation required	Moderate-Slight adverse (not significant in EIA terms)
LA 2a Northern Coastal Area Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Moderate-Slight adverse (not significant in EIA terms)]	No additional mitigation required	Moderate -Slight adverse (not significant in EIA terms)]
LA 2b Southern Coastal Area Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037)	1	Moderate-Slight adverse (not significant in EIA terms)]	No additional mitigation required	Moderate -Slight adverse (not significant in EIA terms)]

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
LA 3a North East Mountain Lowlands Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Moderate-Slight adverse (not significant in EIA terms)	No additional mitigation required	Moderate -Slight adverse (not significant in EIA terms)
LA 3b South East Mountain Lowlands Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Slight adverse (not significant in EIA terms)]	No additional mitigation required	Slight adverse (not significant in EIA terms)]
LA 3c. Southern Hills Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Not Significant adverse (not significant in EIA terms)	No additional mitigation required	Not Significant adverse (not significant in EIA terms)
LA 4a. N11	1	Slight adverse (not significant in EIA terms)]	No additional mitigation required	Slight adverse (not significant in EIA terms)]

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)				
TCA 6 Greystones Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Moderate – Slight adverse (not significant in EIA terms)]	No additional mitigation required	Moderate – Slight adverse (not significant in EIA terms)]
TCA 6b Kilcoole Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Slight adverse (not significant in EIA terms)	No additional mitigation required	Slight adverse (not significant in EIA terms)
TCA 6c Newcastle Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037)	1	Slight adverse (not significant in EIA terms)	No additional mitigation required	Slight adverse (not significant in EIA terms)

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
NISA OWF (CEA-0094)				
TCA 6d Wicklow Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Moderate-Slight adverse (not significant in EIA terms)	No additional mitigation required	Moderate-Slight adverse (not significant in EIA terms)
LCU 2 Lowlands Arklow Bank OWF Phase 2 (CEA0004)	1	Not Significant adverse (not significant in EIA terms)	No additional mitigation required	Not Significant adverse (not significant in EIA terms)
National designated landscape receptor: Bray Head SAA: Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Slight adverse (not significant in EIA terms)	No additional mitigation required	Slight adverse (not significant in EIA terms)
Visual Receptor Groups:	1	Not Significant adverse (not significant in EIA terms)	No additional mitigation required	Not Significant adverse (not significant in EIA terms)

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
Visual Receptor Group 2 Killiney to Bray Dublin Array OW (CEA0037) NISA OWF (CEA-0094)				
Visual Receptor Group 3 Bray Head to Cliff Manor Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Slight adverse (not significant in EIA terms)	No additional mitigation required	Slight adverse (not significant in EIA terms)
Visual Receptor Group 4 Cliff Manor, Greystones, Kilcoole to Five Mile Point Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Slight adverse (not significant in EIA terms)	No additional mitigation required	Slight adverse (not significant in EIA terms)
Visual Receptor Group 5 Wicklow to Wicklow Head	1	Slight adverse (not significant in EIA terms)	No additional mitigation required	Slight adverse (not significant in EIA terms)

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037)				
Visual Receptor Group 6 Dublin and Bray Mountains	1	Slight adverse (not significant in EIA terms)	No additional mitigation required	Slight adverse (not significant in EIA terms)
Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)				
Visual Receptor Group 7 Mountain Uplands	1	Not Significant adverse (not significant in EIA terms)	No additional mitigation required	Not Significant adverse (not significant in EIA terms)
Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)				
Visual Receptor Group 8 Wicklow Head to Brittas Bay	1	Slight adverse (not significant in EIA terms)	No additional mitigation required	Slight adverse (not significant in EIA terms)
Arklow Bank OWF Phase 2 (CEA0004)				

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
Visual Receptor Group 9 Marine Recreational Receptors Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Moderate adverse (not significant in EIA terms)	No additional mitigation required	Moderate adverse (not significant in EIA terms)
Main (Named) Settlements: Killiney (covering Shankill to the south) Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Slight adverse (not significant in EIA terms)	No additional mitigation required	Slight adverse (not significant in EIA terms)
Bray Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Slight adverse (not significant in EIA terms)	No additional mitigation required	Slight adverse (not significant in EIA terms)

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
Greystones Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Moderate-Slight adverse (not significant in EIA terms)	No additional mitigation required	Moderate-Slight adverse (not significant in EIA terms)
Kilcoole Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Moderate-Slight adverse (not significant in EIA terms)	No additional mitigation required	Moderate-Slight adverse (not significant in EIA terms)
Newcastle Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Slight adverse (not significant in EIA terms)	No additional mitigation required	Slight adverse (not significant in EIA terms)
Wicklow Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037)	1	Moderate-Slight adverse (not significant in EIA terms)	No additional mitigation required	Moderate-Slight adverse (not significant in EIA terms)

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
NISA OWF (CEA-0094)				
Arklow Arklow Bank OWF Phase 2 (CEA0004)	1	Slight adverse (not significant in EIA terms)	No additional mitigation required	Slight adverse (not significant in EIA terms)
Key Routes: R131 Road Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Not Significant adverse (not significant in EIA terms)	No additional mitigation required	Not Significant adverse (not significant in EIA terms)
R119 Road Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Slight adverse (not significant in EIA terms)	No additional mitigation required	Slight adverse (not significant in EIA terms)
R761 Road Arklow Bank OWF Phase 2 (CEA0004)	1	Slight adverse (not significant in EIA terms)	No additional mitigation required	Slight adverse (not significant in EIA terms)

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
Dublin Array OW (CEA0037) NISA OWF (CEA-0094)				
M11/ N11 Road Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Slight adverse (not significant in EIA terms)	No additional mitigation required	Slight adverse (not significant in EIA terms)
R750 Road Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037)	1	Slight adverse (not significant in EIA terms)	No additional mitigation required	Slight adverse (not significant in EIA terms)
DART Line (Dublin to Greystones / Dublin to Rosslare Main Line (Greystones to Wicklow) Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Slight adverse (not significant in EIA terms)	No additional mitigation required	Slight adverse (not significant in EIA terms)

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
Southern Sea approach to Dublin Port (Dublin to Cherbourg) Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Moderate / Moderate – Slight adverse (not significant in EIA terms)	No additional mitigation required	Moderate / Moderate – Slight adverse (not significant in EIA terms)
Bray–Greystone Cliff Walk Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Slight adverse (not significant in EIA terms)	No additional mitigation required	Slight adverse (not significant in EIA terms)
Greystone to Wicklow Trail Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)	1	Moderate – Slight adverse (not significant in EIA terms)	No additional mitigation required	Moderate – Slight adverse (not significant in EIA terms)
The Wicklow Way	1	Slight adverse (not significant in EIA terms)	No additional mitigation required	Slight adverse (not significant in EIA terms)

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
Arklow Bank OWF Phase 2 (CEA0004) Dublin Array OW (CEA0037) NISA OWF (CEA-0094)				

13.7 References

899. Environmental Protection Agency (EPA) (2022). EPA Guidelines on the information to be contained in Environmental Impact Assessment Reports. Available at: Guidelines the information to be contained in Environmental Impact Assessment Reports (EIAR) (epa.ie). Available at: https://www.epa.ie/publications/monitoring-assessment/assessment/EIAR_Guidelines_2022_Web.pdf [Accessed 07.05.2024]}
900. European Commission (EC) (1999). Guidelines for the Assessment of Indirect and Cumulative Impact as well as Impact Interactions. Available at: <https://eur-lex.europa.eu/legalcontent/EN/TXT/HTML/?uri=CELEX%3A52021XC1028%2802%29> [Accessed 07.05.2024]}
901. Planning Inspectorate (PINS) (2019). Advice Note Seventeen: Cumulative effects assessment relevant to nationally significant infrastructure projects (version 2). Available from: <https://infrastructure.planninginspectorate.> [Accessed 07.05.2024]}

14 SHIPPING AND NAVIGATION

14.1 Introduction

902. This section of the **CEA Report** presents the findings of the CEA for shipping and navigation, which considers the residual effects presented in **Volume 3, Chapter 16 Shipping and Navigation** alongside the potential effects of other proposed and reasonably foreseeable development. Cumulative effects are considered in this document across the construction and operation and maintenance phases of the CWP Project.
903. The detail and scope of the decommissioning works for the CWP Project will be determined by the relevant legislation and guidance at the time of decommissioning. Project alone impacts during the decommissioning phase of the CWP Project are assessed in EIAR **Volume 3, Chapter 16 Shipping and Navigation**. It is anticipated that the impacts will be no greater than those identified for the construction phase, and therefore no separate assessment of cumulative impacts during the decommissioning phase is presented within this CEA.
904. Updates to the project alone assessment for shipping and navigation as a consequence of ACPs FIR are presented in Section 16 of the EIAR Addendum. This updated CEA incorporates relevant updates from the project alone assessment and has been updated in response to the requests made in item 5 of the FIR.

14.2 Consultation

905. **Table 14-1** provides a summary of stakeholder and regulator feedback received during the consultation process that is relevant to the CEA for shipping and navigation.

Table 14-1 Consultation responses relevant to the CEA for shipping and navigation

Consultee	Comment	How issues have been addressed
Scoping responses		
Irish Lights 1 July 2021	'Cumulative impacts – altered routing cumulatively and potential impact on safety of navigation if all Dublin traffic either diverts north of Kish with a dog-leg into / from Irish Sea, or else goes inshore of banks and between Wicklow Head and OWP in / out of Irish Sea.'	The referenced scenarios have been considered in Section 5.
Topic specific meetings		
Irish Lights 25 March 2021	Irish Lights would expect consideration within the Navigational Risk Assessment (NRA) around cumulative effects on routing, including the effect on vessels associated with Dublin	The referenced scenarios have been considered in Section 5.

Consultee	Comment	How issues have been addressed
	Port, noting planned projects in the area may affect whether such vessels pass inshore or offshore of the banks. In particular, scenarios whereby Dublin traffic either diverts north of Kish and dog-legging into / from Irish Sea, or else goes inshore of the banks.	
Dublin Port 16 June 2021	The assessment should consider cumulative developments including those off Wicklow coast.	Screening of cumulative developments has been undertaken in Section 4.
RNLI 28 February 2023	Project vessels including on a cumulative basis should be considered.	Impacts from project vessels have been assessed in Section 5.
Irish Lights 23 October 2023	There will likely be a need to move certain existing Aids to Navigation (AtoNs), noting this process will consider other local cumulative developments.	Cumulative impacts to vessel routeing are considered in Section 5.
Other		
Hazard Workshop 17 January 2023	Potential for cumulative developments leading to reduction of sea room inshore of the local banks should be considered.	Associated impacts have been assessed in Section 5.

14.3 CEA impact screening

906. The first step in the CEA for shipping and navigation is the identification of which residual impacts assessed for the CWP Project alone have the potential for a cumulative impact with other development (described as 'impact screening'). This screening exercise is set out in **Table 14-2** below.
907. All impacts assessed in Chapter 16 Shipping and Navigation have been considered for the potential for cumulative effect.

Table 14-2 Impacts and potential for cumulative effect

Impact	CWP Project alone residual effect	Potential for significant cumulative effect – screened into the CEA (Yes / No)
Construction		
Impact 1: Vessel displacement leading to increased encounters and collision risk	Yes	Key stakeholder concern was cumulative impact of displacement.
Impact 2: Increased collision risk (third party with project vessel)	Yes	Potential for increased collision risk from project vessels associated with cumulative developments.
Impact 3: Vessel to structure allision risk (vessel to structure)	Yes	Potential for increased allision risk on a cumulative basis.
Impact 4: Reduction in emergency response capability	Yes	Potential for cumulative impacts on baseline incident rates.
Impact 5: Port access restrictions	Yes	Potential for cumulative impacts on port access.
Operation		
Impact 1: Vessel displacement leading to increased encounters and collision risk	Yes	Key stakeholder concern was cumulative impact of displacement.
Impact 2: Increased collision risk (third party with project vessel)	Yes	Potential for increased collision risk from project vessels associated with cumulative developments.
Impact 3: Vessel to structure allision risk (vessel to structure)	Yes	Potential for increased allision risk on a cumulative basis.
Impact 4: Reduction in emergency response capability	Yes	Potential for cumulative impacts on baseline incident rates.
Impact 5: Port access restrictions	Yes	Potential for cumulative impacts on port access.
Impact 6: Reduction in under keel clearance	No	Risk localised to specific cables, and no pathway for cumulative effect.
Impact 7: Anchor interaction with subsea cables	No	Risk localised to specific cables, and no pathway for cumulative effect.

14.4 Stage 3: Information gathering and ‘other development’ screening

908. Stage 2 of the CEA is presented in **Appendix A** of the **CEA Report**. This exercise established a shortlist of other development for shipping and navigation using set criteria.
909. The shortlist of other development screened into the CEA for shipping and navigation at Stage 2 are listed below.
- SSE Renewables – Arklow Bank Wind Park 2 (OWF_01);

- RWE – Dublin Array (OWF_02);
- GE Energy – Arklow Bank Wind Park 1 (OWF_03);
- Statkraft – North Irish Sea Array (OWF_04);
- Parkwind NV – Oriel (OWF_06);
- Dublin Port Company – MP2 Project (CA_16);
- Sure Partners Limited – Arklow Bank Wind Park 2 O&M Facility (CA_30)
- Dublin Port Company – 3FM Project (CA_33);
- Microsoft – SOBR1 subsea fibre optic cable (SC_03);
- Microsoft – SOBR2 subsea fibre optic cable (SC_06);
- MaresConnect Limited – Mares Connect Interconnector (SC_11);
- Minister for Agriculture, Food and the Marine – Development at Howth Fishery Harbour Centre (dredging and reclamation works) (CA_11);
- Irish Water – Greater Dublin Drainage Project (CA_45);
- Statkraft – Site investigation activities to inform the development of the North Irish Sea Array OWF (SUR_24); and
- Statkraft – Site investigation activities to inform the development of the Oriel OWF (SUR_40).

910. Information gathering (Stage 3 of the CEA) has enabled a further review of the other development shortlist for shipping and navigation, including a more detailed consideration of the location, nature and scale of the development, the timing of construction and operation activities, the information available to inform a CEA and the likelihood of a significant effect.
911. This information has been used to screen the Stage 2 shortlist to establish a final list of other development for detailed assessment at Stage 4 of the CEA. The results of the exercise are presented in **Table 14-3** below.

Table 14-3 Summary of other development screened into the CEA for shipping and navigation

Development	Distance from the array site (nm)	Distance from the export cable corridor (nm)	Tier	Included in the CEA (Yes/No)	Rationale
Dublin Array (OWF_02)	1.5	0.0	1	Yes	Offshore wind development which may impact routing
Arklow Bank Wind Park 2 (OWF_01)	5.0	9.5	1	Yes	Offshore wind development which may impact routing
North Irish Sea Array (OWF_04)	27.5	19.3	1	Yes	Offshore wind development which may impact routing
SOBR1 subsea fibre optic cable (SC_03)	14.6	0.6	3	Yes	Potential for cumulative impact with the OECC given proximity when considering potential for concurrent surface activity.
Arklow Bank Wind Park 1 (OWF_03)	11.9	15.3	1	No	Part of baseline
Oriel (OWF_06)	45.3	33.3	1	No	Does not cumulatively impact routes
MP2 Project (CA_16)	13.6	2.3	1	No	Does not cumulatively impact routes. Any associated increase in vessel numbers has already been accounted for and assessed in the CWP Project alone assessment.
Arklow Bank Wind Park 2 O&M Facility (CA_30)	16.6	17.9	1	No	Does not cumulatively impact routes (onshore facility)

Development	Distance from the array site (nm)	Distance from the export cable corridor (nm)	Tier	Included in the CEA (Yes/No)	Rationale
3FM Project (CA_33)	16.9	0.3	1	No	Does not cumulatively impact routes. Any associated increase in vessel numbers has already been accounted for and assessed in the CWP Project alone assessment.
Development at Howth Fishery Harbour Centre (dredging and reclamation works) (CA_11)	12.1	0.0	1	No	Does not cumulatively impact routes.
Greater Dublin Drainage Project (CA_45)	17.9	5.3	1	No	Does not cumulatively impact routes.
Site investigation activities to inform the development of the North Irish Sea Array OWF (SUR_24)	33.5	22.5	1	No	Does not cumulatively impact routes when considering spatial area impacted.
Site investigation activities to inform the development of the Oriel OWF (SUR_40)	45.6	33.0	3	No	Does not cumulatively impact routes when considering spatial area impacted.
SOBR2 subsea fibre optic cable (SC_06)	18.9	5.9	3	No	Does not cumulatively impact routes when considering spatial area impacted by surface activity.
Mares Connect Interconnector (SC_11)	23.3	10.6	3	No	Does not cumulatively impact routes when considering spatial area impacted by surface activity.

14.5 Stage 4: Assessment of cumulative effects

14.5.1 Construction phase

Cumulative impact 1: Vessel displacement leading to increased encounters and collision risk

912. The residual impact for the CWP Project in isolation was assessed as being tolerable and As Low As Reasonably Practicable (ALARP) during the construction phase.
913. For Tier 1 projects, as per the cumulative routeing assessment undertaken in the NRA, there were only minor changes in terms of deviation magnitudes between the in isolation and cumulative routeing assessments. This is reflective of the majority of vessels in the area already avoiding the shallow banks, meaning that in addition to there being limited impact from the CWP Project, there is limited additional cumulative impact from the proposed Dublin Array project to the north (located on the Kish and Bray Banks) and from the proposed Arklow Bank project to the south (situated on the Arklow Bank). The majority of vessels in the area are already avoiding these banks.
914. As per the cumulative routeing assessment undertaken in the NRA, vessels on routes to or from Drogheda will likely pass in proximity to NISA. The CWP Project will have low impact on this routeing and will have no impact on access to Drogheda (located in excess of 30 nm north of the array site). On this basis, deviations within the localised area around the array site are likely to be no different to the in isolation case. No main routes were identified as directly interacting with Oriel.
915. It was noted at the Hazard Workshop that promulgation of information will be a key mitigation to manage this impact, in particular in relation to installation of export cables for the CWP Project and the NISA and Dublin Array projects. The CWP Project approach to promulgation of information is set out in the Navigational Safety Plan (NSP), and it is likely that other cumulative projects will take a similar approach. This will ensure mariners are aware of the ongoing construction works associated with the CWP Project and also the statuses of other cumulative developments. Any displacement impact associated with the OECC and any other Tier 1 export cable installation will be temporary in nature and spatially limited to the area around the operation.
916. Irish Lights raised during consultation (see Section 1) that in addition to a scenario where vessels pass inshore of the local shallow banks, the possibility that vessels going to or from Dublin Port may pass offshore of the banks in the cumulative scenario should also be considered. It is not considered likely that many vessels currently passing inshore would choose this passage assuming the presence of Tier 1 developments given that Dublin Port could still be accessed via the inshore routeing, and it was not suggested either at the Hazard Workshop or during the regular operators outreach that vessels may choose such passage. It is noted that there is sea room available to accommodate such a deviation should vessels so choose.
917. Irish Lights also indicated during consultation that there may be a need to consider the existing buoyage with regards to how risks to vessel routeing were managed, including cumulatively with other developments. The CWP Project will work with Irish Lights as part of the Lighting and Marking Plan (LMP) process to ensure that buoyage and AtoNs associated with the CWP Project are suitable to manage any risk. This will consider the need for temporary buoyage during construction.
918. Noting the promulgation of information approach as set out in the NSP, and agreement of lighting and marking via the LMP process, the cumulative risk for Tier 1 projects is considered as remaining tolerable and ALARP during the construction phase.

919. There are no Tier 2 projects of relevance, or for which there is adequate information to undertake a meaningful assessment. As such, there are anticipated to be no significant cumulative effects of CWP with Tier 2 projects; the same conclusion being drawn for Tier 1 and Tier 2 combined.
920. The SOBR1 subsea fibre optic cable is the only Tier 3 project screened in given its proximity to the OECC. It is planned to run between Dublin Bay and Anglesey (Wales), and is located approximately 0.6 nm from the OECC at Dublin Bay, giving potential for cumulative vessel displacement effects with the OECC. However, it is not anticipated that there will be any temporal overlap between the CWP Project construction phase and that of the SOBR1 cable. As such any cumulative effects during the construction phase are not expected.
921. Given this, the cumulative risk for Tier 3 projects is considered as remaining **tolerable and ALARP** during the construction phase; the same conclusion drawn for Tier 1, Tier 2, and Tier 3 combined.

Cumulative impact 2: Increased collision risk (third party with project vessel)

922. The residual impact for the CWP Project in isolation was assessed as being tolerable and ALARP during the construction phase.
923. All vessels associated with the construction of the CWP Project will comply with the Convention on the International Regulations for Preventing Collisions at Sea (COLREGs) (IMO, 1972/77) and International Convention for the Safety of Life at Sea (SOLAS) (IMO, 1974); regulations and movements will be managed via marine coordination. The CWP Project may also utilise advisory safe passing distances around works, structures and / or construction vessels to alert passing third-party traffic to areas which should be avoided to minimise collision risk. Moreover, the buoyed construction area will serve to protect project vessels from passing third-party vessels, noting that third-party vessels are not expected to regularly navigate within the buoyed construction area. These measures are set out in the NSP.
924. It is noted that the approaches taken by other projects with regards to vessel procedures, and also the ports to be used, cannot be confirmed at this stage. However, all vessels associated with other cumulative developments will be required to comply with the COLREGs (IMO, 1972/77) and SOLAS (IMO, 1974), and it is considered likely that similar measures in terms of use of advisory safe passing distances and use of construction buoyage may also be implemented.
925. It was raised at the Hazard Workshop that the cable installation process would require careful planning and management to ensure interaction with third-party traffic was limited, noting general concern about the cumulative impact on vessels passing inshore of the local shallow banks. As above, details of the associated works will be promulgated, advisory safe passing distances may be used and any interactions will be managed via COLREGs, noting that they will likely be localised in nature and short term in duration. Therefore, should an encounter incident occur, the vessels involved are likely to be able to resume their respective passages with no long-term consequences.
926. Noting the promulgation of information approach as set out in the NSP, the cumulative risk for Tier 1 projects is considered as remaining tolerable and ALARP during the construction phase.
927. There are no Tier 2 projects of relevance, or for which there is adequate information to undertake a meaningful assessment. As such, there are anticipated to be no significant cumulative effects of CWP with Tier 2 projects; the same conclusion being drawn for Tier 1 and Tier 2 combined.
928. The SOBR1 subsea fibre optic cable is the only Tier 3 project of relevance. However, it is anticipated that there will not be temporal overlap between the CWP Project construction phase and that of the SOBR1 cable, and as such any cumulative effects during the construction phase are not expected.
929. Given this, the cumulative risk for Tier 3 projects is considered as remaining tolerable and ALARP during the construction phase; the same conclusion drawn for Tier 1, Tier 2, and Tier 3 combined.

Cumulative impact 3: Vessel to structure allision risk (vessel to structure)

930. The residual impact for the CWP Project in isolation was assessed as being tolerable and ALARP during the construction phase.
931. Given limited anticipated change to cumulative routeing patterns over the in isolation case, there is unlikely to be any notable increase in localised allision risk to vessels passing the array site. Lighting and marking during construction, in agreement with Irish Lights, will ensure that localised risk is managed, noting this may include use of temporary construction buoyage.
932. Other developments will also be required to agree lighting and marking with Irish Lights, noting that Irish Lights also indicated during consultation (see Section 1) that existing buoyage would need to be considered cumulatively to ensure that cumulative risks to vessels including allision were managed. The CWP Project will work with Irish Lights as part of the LMP process to ensure that buoyage and AtoNs associated with the CWP Project are suitable to manage any risk during the construction phase.
933. The CWP Project approach to promulgation of information is set out in the NSP, and this will ensure that mariners are aware of the presence of partially completed and pre-commissioned structures, which will minimise allision risk. It is likely that other cumulative projects will take a similar approach. This will ensure mariners are aware of the ongoing construction works associated with the CWP Project, including the status of structures, and also the statuses of other cumulative developments.
934. Noting the promulgation of information approach as set out in the NSP, and agreement of lighting and marking via the LMP process, the cumulative risk for Tier 1 projects is considered as remaining tolerable and ALARP during the construction phase.
935. There are no Tier 2 or Tier 3 projects of relevance (noting the SOBR1 subsea fibre optic cable does not create any allision risk), or for which there is adequate information to undertake a meaningful assessment. As such, there are anticipated to be no significant cumulative effects of CWP with Tier 2 or Tier 3 projects; the same conclusion being drawn for Tier 1, Tier 2, and Tier 3 combined.

Cumulative impact 4: Reduction in emergency response capability

936. The residual impact for the CWP Project in isolation was assessed as being tolerable and ALARP during the construction phase.
937. Given low baseline incident rates, and noting the additional self-help resources associated with the CWP Project and other cumulative developments, there is not considered likely to be a notable effect on emergency response resources at a cumulative level.
938. Both Layout Options A and B include multiple lines of orientation through the Wind Turbine Generators (WTGs), with a minimum single line of orientation also provided when the Offshore Substation (OSS) is included, meaning the layouts are compliant with Search and Rescue (SAR) access requirements in current UK guidance in the form of MGN 654 (MCA, 2021), and the newly published equivalent DoT Guidance ((DoT, 2025a) and (DoT, 2025b)). This means the localised spatial area covered by the array site will allow access for SAR responders, with other cumulative developers also being required to consider SAR access within their own layout designs in liaison with the Irish Coastguard (IRCG). A Safety Justification was submitted to the IRCG for both layout options on the 2nd December 2026, and following review the IRCG confirmed via a letter on the 11th 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.
939. On this basis, the cumulative risk for Tier 1 projects is considered as remaining tolerable and ALARP during the construction phase.

940. There are no Tier 2 projects of relevance, or for which there is adequate information to undertake a meaningful assessment. As such, there are anticipated to be no significant cumulative effects of CWP with Tier 2 projects; the same conclusion being drawn for Tier 1 and Tier 2 combined.
941. The SOBR1 subsea fibre optic cable is the only Tier 3 project of relevance. However, it is anticipated that there will not be temporal overlap between the CWP Project construction phase and that of the SOBR1 cable, and as such any cumulative effects during the construction phase are not expected.
942. Given this, the cumulative risk for Tier 3 projects is considered as remaining tolerable and ALARP during the construction phase; the same conclusion drawn for Tier 1, Tier 2, and Tier 3 combined.

Cumulative impact 5: Port access restrictions

943. The residual impact for the CWP Project in isolation was assessed as being broadly acceptable during the construction phase.
944. As per Section 5.1.1, there is limited impact on vessel routing from the CWP Project, and as such vessel routes on approach to local ports will not be impeded by the construction works within the Marine Safety Demarcation Area (MSDA). There may be some impact on approach to Dublin Bay from the cable installation within the OECC and other Tier 1 export cable installations, however any such impact will be temporary and spatially limited. The CWP Project approach to promulgation of information is set out in the NSP, and it is likely that other cumulative projects will take a similar approach. This will ensure mariners are aware of the ongoing construction works associated with the CWP Project and also the statuses of other cumulative developments.
945. During the construction phase, there may be elevated levels of project vessels using local ports, noting that which ports used is yet to be defined. Vessel management procedures are provided in the NSP and it is likely that other cumulative projects will take a similar approach. This includes marine coordination.
946. On this basis, the cumulative risk for Tier 1 projects is considered as remaining broadly acceptable during the construction phase.
947. There are no Tier 2 projects of relevance, or for which there is adequate information to undertake a meaningful assessment. As such, there are anticipated to be no significant cumulative effects of CWP with Tier 2 projects; the same conclusion being drawn for Tier 1 and Tier 2 combined.
948. The SOBR1 subsea fibre optic cable is the only Tier 3 project of relevance. However, it is anticipated that there will not be temporal overlap between the CWP Project construction phase and that of the SOBR1 cable, and as such any cumulative effects during the construction phase are not expected.
949. Given this, the cumulative risk for Tier 3 projects is considered as remaining **broadly acceptable** during the construction phase; the same conclusion drawn for Tier 1, Tier 2, and Tier 3 combined.

14.5.2 Operation and maintenance

Cumulative impact 1: Vessel displacement leading to increased encounters and collision risk

950. The residual impact for the CWP Project in isolation was assessed as being broadly acceptable during the operation and maintenance phase.
951. As per the cumulative routing assessment undertaken in the NRA, there were only minor changes in terms of deviation magnitudes between the in isolation and cumulative routing assessments. This is reflective of the majority of vessels in the area already avoiding the shallow banks, meaning that in

addition to there being limited impact from the CWP Project, there is limited additional cumulative impact from the proposed Dublin Array project to the north (located on the Kish and Bray Banks) and from the proposed Arklow Bank project to the south (situated on the Arklow Bank). The majority of vessels in the area are already avoiding these banks.

952. As per the cumulative routing assessment undertaken in the NRA, vessels on routes to or from Drogheda will likely pass in proximity to NISA. The CWP Project will have low impact on this routing and will have no impact on access to Drogheda (located in excess of 30 nm north of the array site). On this basis, deviations within the localised area around the array site are likely to be no different to the in isolation case. No main routes were identified as directly interacting with Oriol.
953. It was noted at the Hazard Workshop that promulgation of information will be a key mitigation to manage this impact. The CWP Project approach to promulgation of information is set out in the NSP, and it is likely that other cumulative projects will take a similar approach. This will ensure mariners are aware of the CWP Project, including any major maintenance works (including cable maintenance in the OECC) and also the statuses of other cumulative developments.
954. Irish Lights raised during consultation (see Section 1) that in addition to a scenario where vessels pass inshore of the local shallow banks, the possibility that vessels going to or from Dublin Port may pass offshore of the banks in the cumulative scenario should also be considered. It is not considered likely that many vessels currently passing inshore would choose this passage, assuming the presence of Tier 1 developments, given that Dublin Port could still be accessed via the inshore routing, and it was not suggested either at the Hazard Workshop or during the regular operators outreach that vessels may choose such passage. It is noted that there is sea room available to accommodate such a deviation should vessels so choose.
955. Irish Lights also indicated during consultation that there may be a need to consider the existing buoyage with regards to how risks to vessel routing were managed, including cumulatively with other developments. The CWP Project will work with Irish Lights as part of the LMP process to ensure that buoyage and AtoN associated with the CWP Project are suitable to manage any risk.
956. Noting the promulgation of information approach as set out in the NSP, and agreement of lighting and marking via the LMP process, the cumulative risk for Tier 1 projects is considered as remaining broadly acceptable during the operation and maintenance phase.
957. There are no Tier 2 projects of relevance, or for which there is adequate information to undertake a meaningful assessment. As such, there are anticipated to be no significant cumulative effects of CWP with Tier 2 projects; the same conclusion being drawn for Tier 1 and Tier 2 combined.
958. The SOBR1 subsea fibre optic cable is the only Tier 3 project of relevance. It is planned to run between Dublin Bay and Anglesey (Wales), and is located approximately 0.6 nm from the OECC at Dublin Bay, giving potential for cumulative vessel displacement effects. However, any operation and maintenance activities will be spatially limited and temporary in nature. Cable maintenance is also likely to be an infrequent occurrence. The CWP Project approach to promulgation of information is set out in the NSP, and it is likely that other cumulative projects will take a similar approach. This will ensure mariners are aware of the CWP Project and also the statuses of other cumulative developments.
959. Given this, the cumulative risk for Tier 3 projects is considered as remaining **broadly acceptable** during the operation and maintenance phase; the same conclusion drawn for Tier 1, Tier 2 and Tier 3 combined.

Cumulative impact 2: Increased collision risk (third party with project vessel)

960. The residual impact for the CWP Project in isolation was assessed as being tolerable and ALARP during the operation and maintenance phase.

961. All vessels associated with the operation and maintenance of the CWP Project will comply with the COLREGs (IMO, 1972/77) and SOLAS (IMO, 1974) regulations, and movements will be managed via marine coordination. The CWP Project may also utilise advisory safe passing distances around major maintenance works, structures and / or project vessels to alert passing third-party traffic to areas which should be avoided to minimise collision risk. These measures are set out in the NSP.
962. It is noted that the approaches taken by other projects with regards to vessel procedures, and also the ports to be used, cannot be confirmed at this stage. However, all vessels associated with other cumulative developments will be required to comply with the COLREGs (IMO, 1972/77) and SOLAS (IMO, 1974), and it is considered likely that similar measures as detailed above may also be implemented.
963. Noting the promulgation of information approach as set out in the NSP, the cumulative risk for Tier 1 projects is considered as remaining tolerable and ALARP during the operation and maintenance phase.
964. There are no Tier 2 projects of relevance, or for which there is adequate information to undertake a meaningful assessment. As such, there are anticipated to be no significant cumulative effects of CWP with Tier 2 projects; the same conclusion being drawn for Tier 1 and Tier 2 combined.
965. The SOBR1 subsea fibre optic cable is the only Tier 3 project of relevance. However, any operation and maintenance activities will likely to be infrequent with far fewer project vessels compared to the construction phase (given surface activity required for maintenance is likely to be an infrequent event). In the unlikely event that concurrent surface activities occur, the impact would be spatially and temporally limited. The CWP Project approach to promulgation of information is set out in the NSP, and it is likely that other cumulative projects will take a similar approach. This will ensure mariners are aware of the CWP Project and also the statuses of other cumulative developments.
966. Given this, the cumulative risk for Tier 3 projects is considered as remaining **tolerable and ALARP** during the operation and maintenance phase; the same conclusion drawn for Tier 1, Tier 2 and Tier 3 combined.

Cumulative impact 3: Vessel to structure allision risk (vessel to structure)

967. The residual impact for the CWP Project in isolation was assessed as being tolerable and ALARP during the operation and maintenance phase.
968. Given limited anticipated change to cumulative routeing patterns over the in isolation case, there is unlikely to be any notable increase in localised allision risk to vessels passing the array site. Lighting and marking in agreement with Irish Lights will ensure that localised risk is managed.
969. Other developments will also be required to agree lighting and marking with Irish Lights, noting that Irish Lights also indicated during consultation (see Section 1) that existing buoyage would need to be considered cumulatively to ensure that cumulative risks to vessels including allision were managed. The CWP Project will work with Irish Lights as part of the LMP process to ensure that buoyage and AtoNs associated with the CWP Project are suitable to manage any risk during the operation and maintenance phase.
970. The CWP Project approach to promulgation of information is set out in the NSP, and this will ensure that mariners are aware of the presence of structures within the array site, which will minimise allision risk. It is likely that other cumulative projects will take a similar approach.
971. Noting the promulgation of information approach as set out in the NSP, and agreement of lighting and marking via the LMP process, the cumulative risk for Tier 1 projects is considered as remaining tolerable and ALARP during the operation and maintenance phase.

972. There are no Tier 2 or Tier 3 projects of relevance (noting the SOBR1 subsea fibre optic cable does not create any allision risk), or for which there is adequate information to undertake a meaningful assessment. As such, there are anticipated to be no significant cumulative effects of CWP with Tier 2 and Tier 3 projects; the same conclusion being drawn for Tier 1, Tier 2 and Tier 3 combined.

Cumulative impact 4: Reduction in emergency response capability

973. The residual impact for the CWP Project in isolation was assessed as being tolerable and ALARP during the operation and maintenance phase.
974. Given low baseline incident rates, and noting the additional self-help resources associated with the CWP Project and other cumulative developments, there is not considered likely to be a notable effect on emergency response resources at a cumulative level.
975. Both Layout Options A and B include multiple lines of orientation through the WTGs, with a minimum single line of orientation also provided when the OSS are included, meaning the layouts are compliant with SAR access requirements in current UK guidance in the form of MGN 654 (MCA, 2021) and the newly published equivalent DoT Guidance ((DoT, 2025a) and (DoT, 2025b)). This means the localised spatial area covered by the array site will allow access for SAR responders, with other cumulative developers also being required to consider SAR access within their own layout designs in liaison with IRCG. A Safety Justification was submitted to the IRCG for both layout options on the 2nd December 2026, and following review the IRCG confirmed via a letter on the 11th 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.
976. On this basis, the cumulative risk for Tier 1 projects is considered as remaining tolerable and ALARP during the operation and maintenance phase.
977. There are no Tier 2 projects of relevance, or for which there is adequate information to undertake a meaningful assessment. As such, there are anticipated to be no significant cumulative effects of CWP with Tier 2 projects; the same conclusion being drawn for Tier 1 and Tier 2 combined.
978. The SOBR1 subsea fibre optic cable is the only Tier 3 project screened in. It is unlikely that the operational OECC will have any notable impact on emergency response rates, and therefore any cumulative impact arising from the addition of the SOBR1 subsea fibre optic cable is also unlikely.
979. Any operation and maintenance activities will be temporary in nature and likely to be an infrequent occurrence. Even in the unlikely event of concurrent surface activity associated with the cables, SAR access would not be impeded. The CWP Project approach to promulgation of information is set out in the NSP, and it is likely that other cumulative projects will take a similar approach. This will ensure mariners are aware of the CWP Project and also the statuses of other cumulative developments.
980. Given this, the cumulative risk for Tier 3 projects is considered as remaining **tolerable and ALARP** during the operation and maintenance phase; the same conclusion drawn for Tier 1, Tier 2 and Tier 3 combined.

Cumulative impact 5: Port access restrictions

981. The residual impact for the CWP Project in isolation was assessed as being broadly acceptable during the operation and maintenance phase.
982. As per Section 5.1.1, there is limited impact on vessel routeing from the CWP Project, and as such, vessel routes on approach to local ports will not be impeded by the structures within the array site. There may be some impact on approach to Dublin Bay from any cable maintenance within the OECC

and other Tier 1 and Tier 3 cable maintenance, however any such impact will be temporary and spatially limited. Cable maintenance is also likely to be an infrequent occurrence. The CWP Project approach to promulgation of information is set out in the NSP, and it is likely that other cumulative projects will take a similar approach. This will ensure mariners are aware of the CWP Project and also the statuses of other cumulative developments.

983. During the operation and maintenance phase, there are likely to be lower levels of project vessels using local ports than during the construction phase, noting which ports used is yet to be defined. Vessel management procedures are provided in the NSP and it is likely that other cumulative projects will take a similar approach. This includes marine coordination.
984. On this basis, the cumulative risk for Tier 1 projects is considered as remaining broadly acceptable during the operation and maintenance phase.
985. There are no Tier 2 projects of relevance, or for which there is adequate information to undertake a meaningful assessment. As such, there are anticipated to be no significant cumulative effects of CWP with Tier 2 projects; the same conclusion being drawn for Tier 1 and Tier 2 combined.
986. The SOBR1 subsea fibre optic cable is the only Tier 3 project of relevance. Any cumulative port access impact would only arise if any surface OECC maintenance activity occurred concurrently with the SOBR1 installation or any future maintenance. Such an event is unlikely based on surface maintenance activity being an infrequent event. Should there be any concurrent surface activity then it would be spatially and temporally limited. The NSP will ensure mariners are aware of the CWP Project.
987. Given this, the cumulative risk for Tier 3 projects is considered as remaining **broadly acceptable** during the operation and maintenance phase; the same conclusion drawn for Tier 1, Tier 2 and Tier 3 combined.

14.6 CEA summary

988. This CEA, which supports EIAR Volume 3, Chapter 16 has assessed the potential cumulative effects on shipping and navigation from the construction and operation and maintenance phases of the CWP Project alongside other developments.
989. **Table 14-4** below has been adopted from the PINS advice on CEA for NSIPs (PINS, 2024) as a means of summarising the potential adverse or beneficial cumulative effects of the CWP Project with other development. It summarises the outcomes of the detailed assessment provided above and sets out the proposed mitigation measures needed to address cumulative effects, if deemed necessary.
990. In summary, the CEA for shipping and navigation does not identify any significant cumulative effects resulting from the CWP Project alongside other development.

Table 14-4 Summary of cumulative effects assessment.

ID	Tier	Significance of cumulative effect	Proposed mitigation measure(s) to address cumulative effect	Residual cumulative effect
Construction phase				
Cumulative Impact 1: Vessel displacement leading to increased encounters and collision risk				
OWF_01 OWF_02 OWF_04 SC_03	1 and 3	Tolerable and ALARP (not significant in EIA terms)	No additional mitigation required	Tolerable and ALARP (not significant in EIA terms)
Cumulative Impact 2: Increased collision risk (third party with project vessel)				
OWF_01 OWF_02 OWF_04 SC_03	1 and 3	Tolerable and ALARP (not significant in EIA terms)	No additional mitigation required	Tolerable and ALARP (not significant in EIA terms)
Cumulative Impact 3: Vessel to structure allision risk (vessel to structure)				
OWF_01 OWF_02 OWF_04	1	Tolerable and ALARP (not significant in EIA terms)	No additional mitigation required	Tolerable and ALARP (not significant in EIA terms)

Cumulative Impact 4: Reduction in emergency response capability

OWF_01 OWF_02 OWF_04 SC_03	1 and 3	Tolerable and ALARP (not significant in EIA terms)	No additional mitigation required	Tolerable and ALARP (not significant in EIA terms)

Cumulative Impact 5: Port access restrictions

OWF_01 OWF_02 OWF_04 SC_03	1 and 3	Broadly acceptable (not significant in EIA terms)	No additional mitigation required	Broadly acceptable (not significant in EIA terms)

Operation and maintenance phase

Cumulative Impact 1: Vessel displacement leading to increased encounters and collision risk

OWF_01 OWF_02 OWF_04 SC_03	1 and 3	Broadly acceptable (not significant in EIA terms)	No additional mitigation required	Broadly acceptable (not significant in EIA terms)

Cumulative Impact 2: Increased collision risk (third party with project vessel)

OWF_01 OWF_02 OWF_04	1 and 3	Tolerable and ALARP (not significant in EIA terms)	No additional mitigation required	Tolerable and ALARP (not significant in EIA terms)

SC_03				
Cumulative Impact 3: Vessel to structure allision risk (vessel to structure)				
OWF_01 OWF_02 OWF_04	1	Tolerable and ALARP (not significant in EIA terms)	No additional mitigation required	Tolerable and ALARP (not significant in EIA terms)
Cumulative Impact 4: Reduction in emergency response capability				
OWF_01 OWF_02 OWF_04 SC_03	1 and 3	Tolerable and ALARP (not significant in EIA terms)	No additional mitigation required	Tolerable and ALARP (not significant in EIA terms)
Cumulative Impact 5: Port access restrictions				
OWF_01 OWF_02 OWF_04 SC_03	1 and 3	Broadly acceptable (not significant in EIA terms)	No additional mitigation required	Broadly acceptable (not significant in EIA terms)

14.7 References

991. DoT (2025a). Guidance on Safety of Navigation & Emergency Response: Offshore Renewable Energy Installations.
992. DoT (2025b). Standard Operating Procedure 07-2025 Offshore Renewable Energy Installations: Guidance and Operational Considerations for SAR and Emergency Response.
993. EPA (2022). Guidelines on the information to be contained in Environmental Impact Assessment Reports.
994. European Commission (1999). Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions.
995. IMO (1972/77). Convention on the International Regulations for Preventing Collisions at Sea (COLREGs).
996. IMO (1974). International Convention for the Safety of Life at Sea (SOLAS).
997. IMO (2018). Revised Guidelines for Formal Safety Assessment (FSA) for Use in the Rule-Making Process. MSC-MEPCC.2/Circ.12/Rev.2. London, UK: IMO.
998. MCA (2021). MGN 654 (Merchant and Fishing) Safety of Navigation: Offshore Renewable Energy Installations (OREIs) – Guidance on UK Navigational Practice, Safety and Emergency Response.
999. PINS (2024). Nationally Significant Infrastructure Projects: Advice on Cumulative Effects Assessment.

15 AVIATION, MILITARY AND RADAR

15.1 Introduction

1000. This section of the **CEA Report** presents the findings of the CEA for aviation, military and radar, which considers the residual effects presented in **EIAR Volume 3, Chapter 17 Aviation, Military and Radar**, and **Section 17** of the **EIAR Addendum** alongside the potential effects of other proposed and reasonably foreseeable development. Cumulative effects are considered in this document across the construction and operation and maintenance phases of the CWP Project.
1001. The CEA for aviation, military and radar has been updated in response to the requests made in item 5 of the Commission's FIR. It supersedes the planning application CEA for aviation, military and radar presented in **Volume 4, Appendix 17.1** of the EIAR.

15.2 Consultation

1002. Stakeholder feedback received during the consultation process that is relevant to the aviation, military and radar impact assessment is provided in **Volume 3, Chapter 17 Aviation, Military and Radar** of the EIAR. No feedback specific to the CEA for aviation, military and radar has been received.

15.3 CEA impact screening

1003. The first step in the CEA for aviation, military and radar is the identification of which residual impacts assessed for the CWP Project alone have the potential for a significant cumulative impact with other development (described as 'impact screening'). This screening exercise is set out in **Table 15-1** below.

Table 15-1 Impacts and potential for cumulative effect

Impact	CWP Project alone residual effect	Potential for significant cumulative effect – screened into the CEA (Yes / No)
Construction		
Potential impact on Dublin Airport Instrument Flight Procedures (IFPs) due to presence of wind turbines.	Negligible (not significant)	No
Potential impact on low flying (including IROG SAR helicopter operations) due to presence of obstacles (cranes, stationary wind turbines, offshore substation structure (OSSs)).	Negligible (not significant)	No
Operation		
Potential impact on Dublin Airport Air Traffic Control (ATC) radar due to presence of wind turbines.	Negligible (not significant)	No - Bilateral discussions with AirNav Ireland and Dublin Airport Authority (see Appendix B of the FIR Response)

Impact	CWP Project alone residual effect	Potential for significant cumulative effect – screened into the CEA (Yes / No)
		document) have confirmed no impediment to coexistence between the proposed development and aviation operations at Dublin Airport, inclusive of ATC radar operations. Significance of the residual effect predicted to be negligible. Screened out following confirmation of no meaningful interaction.
Potential impact on Met Eireann Dublin Airport meteorological radar due to presence of wind turbines.	Minor (not significant)	No – Screened out on basis of no meaningful interaction with Dublin Airport radar systems (refer to consultation above).

Decommissioning

The detail and scope of the decommissioning works for the CWP Project will be determined by the relevant legislation and guidance at the time of decommissioning. Project alone impacts during the decommissioning phase of the CWP Project are assessed in EIAR **Chapter 17 Aviation, Military and Radar**. It is anticipated that the impacts will be no greater than those identified for the construction phase, and therefore no separate assessment of cumulative impacts during the decommissioning phase is presented within this CEA.

15.4 CEA summary

1004. EIAR **Volume 3, Chapter 17 Aviation, Military and Radar** has assessed the potential for significant effects on aviation, military and radar from the CWP Project.
1005. With the adoption of the mitigation measures outlined within EIAR **Volume 3, Chapter 17 Aviation, Military and Radar** it was predicted that the significance of the residual effects for all phases will be no greater than 'Minor' which is not significant in EIA terms.
1006. However, 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, and as such the potential for project alone effects is generally considered to be negligible. The CWP Project will therefore not materially contribute to any cumulative effects, and it is similarly anticipated that there will not be any significant cumulative effect, especially when considering the need for other relevant projects to implement similar mitigation measures to those identified for the CWP project alone.
1007. Given the above, no further assessment is required.

16 MATERIAL ASSETS: MARINE INFRASTRUCTURE

16.1 Introduction

1008. This section of the **CEA Report** presents the findings of the CEA for material assets - marine infrastructure, which considers the residual effects presented in EIAR **Volume 3, Chapter 18 Material Assets - Marine Infrastructure** alongside the potential effects of other proposed and reasonably foreseeable development. Cumulative effects are considered in this document across the construction and operation and maintenance phases of the CWP Project.
1009. The detail and scope of the decommissioning works for the CWP Project will be determined by the relevant legislation and guidance at the time of decommissioning. Project alone impacts during the decommissioning phase of the CWP Project are assessed in **Volume 3, Chapter 18 Material Assets - Marine Infrastructure**. It is anticipated that the impacts will be no greater than those identified for the construction phase, and therefore no separate assessment of cumulative impacts during the decommissioning phase is presented within this CEA.
1010. This updated CEA incorporates information from the project alone assessment presented in EIAR **Volume 3, Chapter 18 Material Assets - Marine Infrastructure** and has been updated in response to the requests made in item 5 of the FIR.

16.2 Consultation

1011. There was no specific feedback received from stakeholder and regulators relevant to the CEA during the consultation processes. All stakeholder and regulator feedback that is relevant to the project alone for material assets: marine infrastructure is described in **Section 18.2** in EIAR **Volume 3, Chapter 18 Material Assets - Marine Infrastructure**. Stakeholder feedback on the CEA in response to the CWP Project planning application has been responded to in the FIR Response Document and the Observations Response Document, including confirmation of any updates made in response to the feedback received.

16.3 CEA impact screening

1012. The first step in the CEA for material assets: marine infrastructure is the identification of which residual impacts assessed for the CWP Project alone have the potential for a cumulative impact with other development (described as 'impact screening'). This screening exercise is set out in **Table 16-1** below.
1013. Only potential impacts assessed in EIAR **Volume 3, Chapter 18 Material Assets: Marine Infrastructure** as 'not significant' or above are included in the CEA (i.e., those assessed as 'imperceptible' are not taken forward as there is no potential for them to contribute to a cumulative effect).

Table 16-1 Impacts and potential for cumulative effect

Impact	CWP Project along residual effect	Potential for significant cumulative effect – screened into the CEA (Yes / No)
Construction		
Direct effects on marine infrastructure	Imperceptible	No - Sections 18.9 and 18.10 of EIAR Volume 3, Chapter 18 Material Assets - Marine Infrastructure detail the measures that have been adopted by the Project to avoid or reduce impacts on marine infrastructure. These measures include the initial routing and positioning of the offshore infrastructure to avoid marine infrastructure, cable burial and protection commitments (i.e. approaching existing cables from a perpendicular direction) and consultation with asset and energy infrastructure operators. The likelihood of direct or indirect impacts on marine infrastructure as result of the CWP Project is negligible. The significance of residual direct and indirect effects was predicted to be Imperceptible. Screened out as there is no potential significant cumulative effects.
Indirect effects on marine infrastructure	Imperceptible	
Operation & Maintenance		
Direct effects on marine infrastructure	Imperceptible	No - Sections 18.9 and 18.10 of EIAR Volume 3, Chapter 18 Material Assets - Marine Infrastructure detail the measures that have been adopted by the Project avoid or reduce impacts on marine infrastructure. These measures include the initial routing and positioning of the offshore infrastructure to avoid marine infrastructure, cable burial and protection commitments (i.e. approaching existing cables from a perpendicular direction) and consultation with asset and energy infrastructure operators. The likelihood of direct or indirect impacts on marine infrastructure as result of the CWP Project is negligible. The significance of residual direct and indirect effects was predicted to be Imperceptible. Screened out as there is no potential significant cumulative effects.
Indirect effects on marine infrastructure	Imperceptible	
Interference with signals to and from existing television (TV) and radio transmitters and receivers	Imperceptible	No - Appendix 18.3 Television and Radio Desk-Based Report details the assessment of likely TV interference from the CWP Project. The effects from wind farms on TV signals are unlikely beyond distances of 10–15 km. Effects

Impact	CWP Project along residual effect	<u>Potential for significant cumulative effect – screened into the CEA (Yes / No)</u>
		on radio services are judged to be unlikely beyond distances of 5 km. The CWP Project is predicted to produce an interference zone to the southeast of the turbine area, where no dwellings or receivers exist. The likelihood of interference with signals as result of the CWP Project is negligible. The significance of residual effects was predicted to be Imperceptible. Screened out as there is no potential significant cumulative effects
Decommissioning		
Direct effects on marine infrastructure	The detail and scope of the decommissioning works for the CWP Project will be determined by the relevant legislation and guidance at the time of decommissioning. Project alone impacts during the decommissioning phase of the CWP Project are assessed in EIAR Volume 3, Chapter 18 Material Assets - Marine Infrastructure. The likelihood of direct or indirect impacts on marine infrastructure as result of the CWP Project during the construction phase is negligible. The significance of residual direct and indirect effects was predicted to be Imperceptible. It is anticipated that the impacts during the decommissioning phase will be no greater than those identified for the construction phase Screened out as there is no potential significant cumulative effects.	
Indirect effects on marine infrastructure		

16.4 CEA summary

1014. In summary, the CEA for material assets: marine infrastructure does not identify any significant cumulative effects resulting from the CWP Project alongside other developments.
1015. EIAR **Volume 3, Chapter 18 Material Assets: Marine Infrastructure** has assessed the potential for significant effects on material assets: marine infrastructure from the CWP Project.
1016. With the adoption of the mitigation measures outlined within EIAR **Volume 3, Chapter 18 Material Assets: Marine Infrastructure** it was predicted that the significance of the residual effects for all phases will be no greater than 'Imperceptible' which is not significant in EIA terms. Given the above, no further assessment was required.

16.5 References

- 1017. Arup (2021). North Irish Sea Array Offshore Wind Farm – EIA Scoping Report. May 2021.
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- 1019. Dublin Port Company (DPC) (2023). 3FM Project – Report on Consultation process 2021 to 2023.
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- 1021. European Commission (1999). Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions.
- 1022. European Commission (2014). Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment.
- 1023. GoBe Consultants Ltd (2023). Arklow Bank Wind Park 2 – Environmental Impact Assessment Scoping Report. Version 3.0. June 2023.
- 1024. Planning Inspectorate (PINS) (2019). Advice Note Seventeen: Cumulative effects assessment relevant to nationally significant infrastructure projects.
- 1025. RPS (2020). Dublin Port Company MP2 Project – Volume 2 Environmental Impact Assessment Report Main Document. 2020.
- 1026. SLR Consulting Ireland and GoBe Consultants Ltd (2020). Dublin Array Offshore Wind Farm Environmental Impact Assessment Scoping Report. Version 1.0. September 2023.



CEA Report (Part 2)

Appendix 1: Ornithology Quantitative Tables

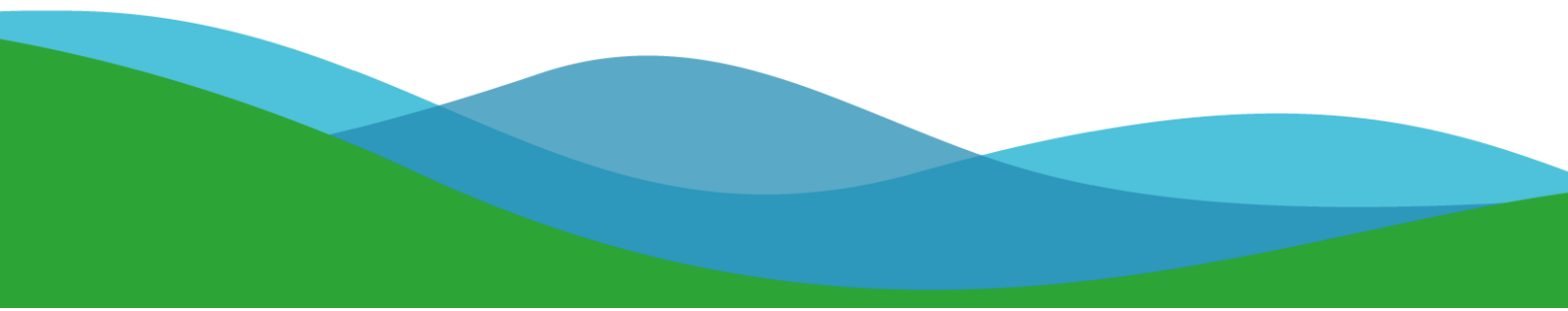


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Abbreviations

Abbreviation	Term in full
CEA	Cumulative Effects Assessment
CGR	Counterfactual Growth Rate
CPS	Counterfactual Population Size
CRM	Collision Risk Modelling
CWP	Codling Wind Park
NPWS	National Parks and Wildlife Service
O&M	Operation and Maintenance
OSS	Offshore Substation
OWF	Offshore Wind Farm
PVA	Population Viability Analysis
FIR	Request for Further Information
SPA	Special Protection Area
WTG	Wind Turbine Generator

CEA ORNITHOLOGY APPENDIX

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 provides quantitative tables in support of the **CEA Report** and **Volume 3** of the **NIS Addendum, Volume 6 In-combination Assessment - Part 2**.

CUMULATIVE EFFECTS ASSESSMENT

1.1 Displacement Impacts

Table 1 Predicted annual mortalities of relevant projects to regional populations of receptors screened in to the cumulative effects assessment from displacement impacts.

Project	Tier	Estimated displacement mortality to regional population (individuals) per species				Notes
		Guillemot	Razorbill	Red-throated diver	Gannet	
Awel-y-Mor	1	22.44	3.46	1.20*	3.70	No updated information since CWP submission in September 2024. Figures as original CWP CEA. *Exception – Displacement mortality estimate for red-throated diver at Awel-y-mor changed to published value as revised project only assessment for CWP now approximately aligns with the methodology used at Awel-y-Mor.
Gwynt y Mor	1	0.00	2.28	0.35	0.00	
Rhyl Flats	1	0.00	0.00	0.24	0.00	
Burbo Bank Extension	1	17.24	0.47	0.30	3.00	
North Hoyle	1	0.00	11.77	0.00	0.00	
Walney Extension 3 + 4	1	30.47	49.67	0.00	9.44	
West of Duddon Sands	1	4.17	0.00	0.00	0.00	
Walney 1& 2	1	0.00	0.00	0.00	0.00	
Burbo Bank	1	0.00	1.80	0.11	0.00	
Ormonde	1	1.19	0.00	0.00	0.00	
Barrow	1	0.00	0.00	0.00	0.00	
Robin Rigg	1	0.14	0.04	0.00	0.00	
Arklow Bank Phase 1	1	0.00	0.00	0.00	0.00	
Twin Hub	1	0.00	0.00	0.00	0.00	
Erebus	1	176.70	19.34	0.00	4.61	
White Cross	1	21.82	3.93	0.00	3.19	
Morgan	1	39.17	8.94	0.00	1.78	Updated information since CWP submission in September 2024. Figures as published by each project.
Morecambe	1	73.45	9.90	0.20	3.89	
Mona	1	39.88	12.60	0.00	2.36	
Llyr 1	1	75.18	13.30	0.00	7.18	
Moor Vannin	1	22.10	10.68	1.68	3.50	

Project	Tier	Estimated displacement mortality to regional population (individuals) per species				Notes
		Guillemot	Razorbill	Red-throated diver	Gannet	
Oriel	1	17.45	11.73	0.00	4.50	
Arklow	1	40.56	41.57	3.40	1.12	
Dublin	1	103.00	18.00	0.00	5.00	
NISA	1	157.89	30.51	0.10	4.07	
Cumulative impact to regional population without Codling		842.85	249.99	7.58	57.34	
Codling (Construction)	1	42.41	15.21	0.735	0.93	
Codling (Operational)	1	84.82	30.42	1.47	1.86	
Cumulative impact to regional population with Codling (construction)		885.26	265.2	8.315	58.27	
Cumulative impact to regional population with Codling (operational)		927.67	280.41	9.05	59.20	

Table 2 Calculation of increase to regional mortality resultant from cumulative displacement impacts and consideration of requirement for PVA when determining impact significance.

Species	Guillemot	Razorbill	Red-throated diver	Gannet
Regional population	1332663	632448	12717	643713
Average annual mortality rate	13.6%	12.9%	22.4%	18.1%
Regional mortalities per annum	181242.2	81585.79	2848.608	116512.1
% increase to regional population annual mortality				
CWP only (construction)	0.023%	0.019%	0.026%	0.001%
CWP only (operational)	0.047%	0.037%	0.052%	0.002%
Tier 1 (excluding CWP)	0.465%	0.306%	0.266%	0.049%
Tier 1 + CWP (construction)	0.488%	0.325%	0.292%	0.050%
Tier 1 + CWP (operational)	0.512%	0.344%	0.318%	0.051%
PVA requirement				
Does increase to regional mortality exceed 1%?	No	No	No	No

1.2 Collision Impacts

Table 3 Predicted annual mortalities of relevant projects to regional populations of receptors screened in to the cumulative effects assessment from collision impacts.

Project	Tier	Estimated collision mortality to regional population (individuals) per species					Notes
		Kittiwake	Herring gull	Great black-backed gull	Gannet	Common tern	
Awel-y-Mor	1	53.86	2.96	4.87	20.49	0.20	No updated information since CWP submission in September 2024. Figures as original CWP CEA.
Gwynt y Mor	1	0.00	0.00	0.00	0.00	0.00	
Rhyl Flats	1	0.00	0.00	0.00	0.00	0.00	
Burbo Bank Extension	1	22.26	28.32		3.57	9.00	
North Hoyle	1	0.00	0.00	0.00	0.00	0.00	
Walney Extension 3 + 4	1	187.60	32.70	16.20	37.40	0.00	
West of Duddon Sands	1	0.00	0.00	0.00	0.00	0.00	
Walney 1& 2	1	0.00	0.00	12.30	0.00	0.00	
Burbo Bank	1	0.00	0.00	0.00	0.00	0.00	
Ormonde	1	2.16	0.44	0.28	2.00	0.00	
Barrow	1	0.00	0.00	0.00	0.00	0.00	
Robin Rigg	1	0.00	0.00	0.00	0.00	0.00	
Arklow Bank Phase 1	1	0.00	0.00	0.00	0.00	0.00	
Twin Hub	1	10.80	22.90	0.00	11.97	0.00	
Erebus	1	58.00	3.00	1.00	7.01	0.00	
White Cross	1	21.46	0.28	0.70	6.55	0.00	

Project	Tier	Estimated collision mortality to regional population (individuals) per species					Notes
		Kittiwake	Herring gull	Great black-backed gull	Gannet	Common tern	
Morgan	1	40.00	10.00	6.00	1.00	0.00	Updated information since CWP submission in September 2024. Figures as published by each project
Morecambe	1	25.45	4.15	1.75	1.26	0.22	
Mona	1	32.67	1.51	4.83	1.69	0.00	
Llŷr 1	1	23.90	0.00	0.00	3.70	0.00	
Moor Vannin	1	46.92	19.41	1.52	4.97	0.00	
Oriel	1	56.28	91.80	65.91	20.71	0.00	
Arklow	1	209.10	1.50	1.80	1.00	8.60	
Dublin	1	29.49	36.01	9.01	3.45	3.00	
NISA	1	19.30	57.20	26.30	4.70	0.20	
Cumulative impact to regional population without Codling		839.25	312.18	152.47	131.47	21.22	
Codling	1	18.28	27.41	4.15	0.89	2.27	
Cumulative impact to regional population with Codling		857.53	339.59	156.62	132.36	23.49	

Table 4 Calculation of increase to regional mortality resultant from cumulative collision impacts and consideration of requirement for PVA when determining impact significance.

Species	Kittiwake	Herring gull	Great black-backed gull	Gannet	Common tern
Regional population	933172	187090	53405	643713	73998
Average annual mortality rate	15.6%	17.2%	9.5%	18.1%	19.1%
Regional mortalities per annum	145574.83	32179.48	5073.48	116512.05	14133.62
% increase to regional population annual mortality					
CWP only	0.013%	0.085%	0.082%	0.001%	0.016%
Tier 1 (excluding CWP)	0.577%	0.970%	3.005%	0.113%	0.150%
Tier 1 + CWP	0.589%	1.055%	3.087%	0.114%	0.166%
PVA requirement					
Does increase to regional mortality exceed 1%?	No, but PVA undertaken*	Yes	Yes	No	No

*Impact significance assessed as moderate, which may or may not be considered significant. Although not meeting the 1% increase to baseline mortality criteria requirement for PVA to determine impact significance, a PVA was undertaken nonetheless to provide additional clarity on whether cumulative impacts were significant.

Table 5 Proportional cumulative collision impact on annual adult survival rate (input values to PVA).

Species	Kittiwake	Herring gull	Great black-backed gull
CWP only	0.00002	0.00015	0.00008
Tier 1 (excluding CWP)	0.00090	0.00167	0.00285
Tier 1 + CWP	0.00092	0.00182	0.00293

Table 6 Cumulative collision impact PVA counterfactual outputs. (CGR = Counterfactual of population Growth Rate; CPS = Counterfactual of Population Size [after 25 years of impact])

Species	Kittiwake		Herring gull		Great black-backed gull	
Counterfactual	CGR	CPS	CGR	CPS	CGR	CPS
CWP only	1.000	0.999	1.00	0.995	1.000	0.998
Tier 1 (excluding CWP)	0.999	0.973	0.998	0.949	0.997	0.923
Tier 1 + CWP	0.999	0.972	0.998	0.945	0.997	0.921

2 In-combination Assessment

2.1 Displacement

2.1.1 Guillemot

Table 7 Predicted annual mortalities apportioned by relevant projects to breeding adult guillemot SPA populations screened in to the in-combination assessment in relation to displacement impacts.

Project	Tier	Estimated displacement mortality to SPA population (breeding adults)			Notes
		Ireland's Eye SPA	Lambay Island SPA	Saltee Islands SPA	
Awel y Mor	1	0.04	0.60	0.00	No updated information since CWP submission in September 2024. Figures as original CWP In-combination assessment
Erebus	1	0.00	0.00	0.00	
Minesto*	1	0.20	6.40	0.00	
Mona	1	0.00	0.00	0.00	Updated information since CWP submission in September 2024. Figures as published by each project.
Morgan	1	0.00	1.10	0.40	
Morecambe	1	0.00	2.70	0.63	

Project	Tier	Estimated displacement mortality to SPA population (breeding adults)			Notes
		Ireland's Eye SPA	Lambay Island SPA	Saltee Islands SPA	
Mooir Vannin	1	0.00	0.00	0.00	
Llŷr 1	1	0.00	0.00	0.00	
Oriel	1	0.13	2.36	0.00	
Arklow	1	1.10	12.30	3.30	
NISA	1	0.64	10.83	1.95	
Dublin	1	5.30	36.63	0.76	
In-combination impact to SPA population without Codling		7.410	72.920	7.035	
CWP		0.88	9.50	1.61	
In-combination impact to SPA population with Codling (construction)		7.849	77.671	7.841	
In-combination impact to SPA population with Codling (operational)		8.288	82.422	8.647	

* Underwater collision mortality

Table 8 Calculation of increase to SPA breeding adult guillemot mortality rate resultant from in-combination displacement impacts and consideration of requirement for PVA when determining the potential for AESI.

SPA	Ireland's Eye SPA	Lambay Island SPA	Saltee Islands SPA
Breeding population	4410	59983	25851
Baseline adult annual mortality rate	6.10%	6.10%	6.10%
SPA mortalities per annum	269.01	3658.96	1576.91
% increase to SPA population annual mortality			
CWP only (operational)	0.326%	0.260%	0.102%
CWP only (construction [50% of operational])	0.163%	0.130%	0.051%
Tier 1 (excluding CWP)	2.755%	1.993%	0.446%
Tier 1 + CWP (construction)	3.081%	2.253%	0.548%
Tier 1 + CWP (operational)	2.918%	2.123%	0.497%
PVA requirement			
Does increase to regional mortality exceed 1%?	Yes, for operational impacts only*	Yes, for operational impacts only*	No

* Although total impact is estimated to result in an increase to SPA baseline mortality rates which exceeds the 1% threshold used to determine the requirement for PVA for operational phase impacts, as the duration of construction phase impacts is short in relation to those during the operational phase (less than three years, compared to 25 years), the use of PVA is not appropriate for use in the assessment of short term construction phase impacts.

Table 9 Proportional in-combination displacement impact survival rate inputs to breeding guillemot SPAs for PVA

SPA	Ireland's Eye SPA	Lambay Island SPA
CWP only	0.00020	0.00016
Tier 1 (excluding CWP)	0.00168	0.00122
Tier 1 + CWP	0.00188	0.00137

Table 10 Guillemot SPA In-combination displacement impact PVA counterfactual outputs. (CGR = Counterfactual of population Growth Rate; CPS = Counterfactual of Population Size [after 25 years of impact])

SPA	Ireland's Eye SPA		Lambay Island SPA	
Counterfactual	CGR	CPS	CGR	CPS
CWP only	1.000	0.994	1.000	0.995
Tier 1 (excluding CWP)	0.998	0.952	0.999	0.966
Tier 1 + CWP	0.998	0.947	0.998	0.961

2.1.2 Razorbill

Table 11 Predicted annual mortalities apportioned by relevant projects to breeding adult razorbill SPA populations screened in to the in-combination assessment for displacement impacts..

Project	Tier	Estimated displacement mortality to SPA population (breeding adults)			Notes
		Ireland's Eye SPA	Lambay Island SPA	Saltee Islands SPA	
Awel y Mor	1	0.02	0.09	0.00	No updated information since CWP submission in September 2024. Figures as original CWP In-combination assessment
Erebus	1	0.00	0.00	0.00	
Minesto*	1	0.04	0.37	0.00	
Mona	1	0.00	0.00	0.00	Updated information since CWP submission in September 2024. Figures as published by project.
Morgan	1	0.00	0.10	0.10	
Morecambe	1	0.01	0.40	0.06	
Moor Vannin	1	0.00	0.00	0.00	
Llŷr 1	1	0.00	0.00	0.00	
Oriel	1	0.14	0.83	0.00	
Arklow	1	0.70	3.20	3.00	
NISA	1	0.13	0.79	0.17	
Dublin	1	0.73	1.79	0.21	
In-combination impact to SPA population without Codling		1.77	7.57	3.54	
CWP		0.33	1.18	0.39	

Project	Tier	Estimated displacement mortality to SPA population (breeding adults)			Notes
		Ireland's Eye SPA	Lambay Island SPA	Saltee Islands SPA	
In-combination impact to SPA population with Codling (construction)		1.93	8.16	3.73	
In-combination impact to SPA population with Codling (operational)		2.10	8.75	3.92	

* underwater collision mortality

Table 12 Calculation of increase to SPA breeding adult razorbill mortality rate resultant from in-combination displacement impacts and consideration of requirement for PVA when determining the potential for AESI

SPA	Ireland's Eye SPA	Lambay Island SPA	Saltee Islands SPA
Breeding population	1600	7353	5669
Baseline adult annual mortality rate	10.50%	10.50%	10.50%
SPA mortalities per annum	168.00	772.07	595.25
% increase to SPA population annual mortality			
CWP only (operational)	0.194%	0.153%	0.065%
CWP only (construction [50% of operational])	0.097%	0.077%	0.033%
Tier 1 (excluding CWP)	1.054%	0.980%	0.594%
Tier 1 + CWP (construction)	1.151%	1.057%	0.626%
Tier 1 + CWP (operational)	1.248%	1.134%	0.659%
PVA requirement			
Does increase to regional mortality exceed 1%?	Yes, for operational impacts only*	Yes, for operational impacts only*	No

* Although total impact is estimated to result in an increase to SPA baseline mortality rates which exceeds the 1% threshold used to determine the requirement for PVA for operational phase impacts, as the duration of construction phase impacts is short in relation to those during the operational phase (less than three years, compared to 25 years), the use of PVA is not considered appropriate for use in the assessment of short term construction phase impacts.

Table 13 Proportional in-combination displacement impact survival rate inputs to breeding razorbill SPAs for PVA

SPA	Ireland's Eye SPA	Lambay Island SPA
CWP only	0.00020	0.00016
Tier 1 (excluding CWP)	0.00111	0.00103
Tier 1 + CWP	0.00131	0.00119

Table 14 Razorbill SPA In-combination displacement impact PVA counterfactual outputs. (CGR = Counterfactual of population Growth Rate; CPS = Counterfactual of Population Size [after 25 years of impact])

SPA	Ireland's Eye SPA		Lambay Island SPA	
Counterfactual	CGR	CPS	CGR	CPS
CWP only	1.000	0.994	1.000	0.995
Tier 1 (excluding CWP)	0.999	0.968	0.999	0.970
Tier 1 + CWP	0.999	0.962	0.999	0.965

2.2 Collision

2.2.1 Kittiwake

Table 15 Predicted annual mortalities apportioned by relevant projects to breeding adult kittiwake SPA populations screened in to in-combination assessment from collision impacts.

Project	Tier	Estimated collision mortality to SPA population (breeding adults)									Notes
		Wicklow Head	Howth Head Coast	Ireland's Eye	Lambay Island	Saltee Islands	Helvick Head to Ballyquin	Ailsa Craig	Rathlin Island	Old Head of Kinsale	
Awel y Mor	1	0.04	0.10	0.07	0.15	0.01	0.00	0.00	0.00	0.00	No updated information since CWP submission in September 2024. Figures as original CWP In-combination assessment
Erebus	1	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	
Mona	1	0.10	0.30	0.20	0.60	0.00	0.00	0.00	1.00	0.00	Updated information since CWP submission in
Morgan	1	0.10	0.40	0.20	0.50	0.10	0.00	0.10	0.40	0.00	

Project	Tier	Estimated collision mortality to SPA population (breeding adults)									Notes
		Wicklow Head	Howth Head Coast	Ireland's Eye	Lambay Island	Saltee Islands	Helvick Head to Ballyquin	Ailsa Craig	Rathlin Island	Old Head of Kinsale	
Morecambe	1	0.07	0.38	0.17	0.38	0.05	0.00	0.05	1.06	0.00	September 2024. Figures as published by project.
Moor Vannin	1	0.09	0.46	0.31	0.70	0.12	0.00	0.01	1.08	0.00	
Llyr 1	1	0.00	0.06	0.03	0.06	0.00	0.00	0.00	0.00	0.00	
Oriel	1	0.09	0.50	0.15	1.35	0.07	0.01	0.06	1.90	0.00	
Arklow	1	6.50	2.60	0.60	4.40	1.10	0.00	0.00	0.00	0.00	
NISA	1	0.05	0.37	0.10	1.71	0.05	0.00	0.02	0.37	0.00	
Dublin	1	0.42	3.02	0.48	2.15	0.08	0.01	0.03	0.60	0.04	
In-combination impact to SPA population without Codling		7.47	8.20	2.32	12.01	1.59	0.03	0.27	6.41	0.04	
CWP		0.57	0.37	0.08	0.53	0.05	0.00	0.02	0.51	0.03	
In-combination impact to SPA population with Codling		8.04	8.57	2.40	12.54	1.64	0.03	0.29	6.92	0.07	

Table 16 Calculation of increase to SPA breeding adult kittiwake mortality rate resultant from in-combination collision impacts and consideration of requirement for PVA when determining the potential for AESI.

SPA	Wicklow Head	Howth Head Coast	Ireland's Eye	Lambay Island	Saltee Islands	Helvick Head to Ballyquin	Ailsa Craig	Rathlin Island	Old Head of Kinsale	North-west Irish Sea
Breeding population	1290	3546	802	6640	2076	130	980	27412	1442	10988* ¹
Baseline adult annual mortality rate	14.60%	14.60%	14.60%	14.60%	14.60%	14.60%	14.60%	14.60%	14.60%	14.60%
SPA mortalities per annum	188.34	517.72	117.09	969.44	303.10	18.98	143.08	4002.15	210.53	1604.25
% increase to SPA population annual mortality										
CWP only (operational)	0.30%	0.07%	0.07%	0.05%	0.02%	0.02%	0.01%	0.01%	0.01%	0.06%* ²
Tier 1 (excluding CWP)	3.97%	1.58%	1.98%	1.24%	0.52%	0.15%	0.19%	0.16%	0.02%	1.40%* ²
Tier 1 + CWP	4.27%	1.65%	2.05%	1.29%	0.54%	0.17%	0.20%	0.17%	0.03%	1.47%* ²
PVA requirement										
Does increase to regional mortality exceed 1%?	Yes	Yes	Yes	Yes	No	No	No	No	No	Yes

*1 Sum of Howth Head Coast, Ireland's Eye and Lambay Island breeding populations

*2 From sum of impacts to Howth Head Coast, Ireland's Eye and Lambay Island breeding populations

Table 17 Proportional in-combination collision impact survival rate inputs to breeding kittiwake SPAs for PVA

SPA	Wicklow Head	Howth Head Coast	Ireland's Eye	Lambay Island	North-west Irish Sea
CWP only	0.00044	0.00010	0.00010	0.00008	0.00009
Tier 1 (excluding CWP)	0.00579	0.00231	0.00289	0.00181	0.00205
Tier 1 + CWP	0.00623	0.00242	0.00299	0.00189	0.00214

Table 18 Kittiwake SPA In-combination collision impact PVA counterfactual outputs. (CGR = Counterfactual of population Growth Rate; CPS = Counterfactual of Population Size [after 25 years of impact])

SPA	Wicklow Head		Howth Head Coast		Ireland's Eye		Lambay Island		North-west Irish Sea	
Counterfactual	CGR	CPS	CGR	CPS	CGR	CPS	CGR	CPS	CGR	CPS
CWP only	0.999	0.984	1.000	0.997	1.000	0.995	1.000	0.998	1.000	0.997
Tier 1 (excluding CWP)	0.993	0.836	0.997	0.931	0.997	0.917	0.998	0.946	0.998	0.938
Tier 1 + CWP	0.993	0.825	0.997	0.929	0.996	0.910	0.998	0.945	0.997	0.936

3. For the kittiwake SCI of Wicklow Head SPA, the in-combination assessment in the original application, included additional Density Dependent PVA modelling to assess for no AESI. In the absence of information relating to how compensatory density dependence (which is typically regarded as ubiquitous among seabird meta-populations), a range of values to characterise the shape and strength of the density dependence functions were applied to describe the relationship between productivity and colony size.
4. These values consisted of:
 - A range of maximum average reproductive rates (Max D values) which may be achieved in the absence of intra-specific and intra-colony competitive effects (from 0.7 fledglings per pair to characterise an extremely weak potential for additional population growth, to 1.5 fledglings per pair to characterise a stronger, but still biologically feasible potential for additional growth. [Note: Clutch size varies from one to three eggs, with the mean clutch size slightly below two eggs, and more one egg clutches than three (Coulson, 2011)]. Of the three modelled values (0.7, 1.0 and 1.5 fledglings per pair), the mid-value of 1.0 is likely to be the most biologically realistic demographic response to the removal of competitive effects, as maximum average productivity values of 0.7 fledglings per breeding pair for kittiwake are lower than the frequently cited value of 0.8 from observations by Coulson (2016), below which colony sizes decline. Similarly, average annual colony productivities of 1.5 fledglings per breeding pair are considered rare events (Coulson, 2016¹).
 - A range of shape parameters (b values) to characterise how strongly density dependence manifests in relation to deviation from the carrying capacity population (which for modelling

¹ Coulson, J. C. (2017). Productivity of the Black-legged Kittiwake *Rissa tridactyla* required to maintain numbers. *Bird Study*, 64(1), 84–89. <https://doi.org/10.1080/00063657.2016.1274286>

purposes is set as the 2023 count of 1,290 individuals / 645 breeding pairs). From 0.25 (where changes to reproductive rates occur extremely slowly as population sizes deviate from carrying capacity), to 2 (where changes to reproductive rates occur more rapidly). Of the four modelled values (0.25, 0.5, 1 and 2), 1 is considered the most realistic, while still conservative, option. This interpretation is based upon the following rationale:

- Compensatory density dependence effects are so routinely observed as regulators of seabird population sizes (Horswill and Robinson, 2015) as to be considered ubiquitous (Gayert et al., 2017).
- Kittiwake demographic parameters (survival and productivity rates) are highly variable between years as a result of numerous factors entirely unrelated (or only tenuously related) to density dependence (Coulson, 2011¹).

5. For compensatory density dependence to have been repeatedly observed to be distinguishable within these inherently 'noisy' population trajectory signals indicates that these effects are unlikely to be characterised by the lowest b values (0.25 and 0.5), as such relationships between productivity and population size would be effectively indistinguishable from density independent systems in most instances. The effect of Max D and b parameters upon the relationship between reproductive rates and population size are shown in **Plate A**.

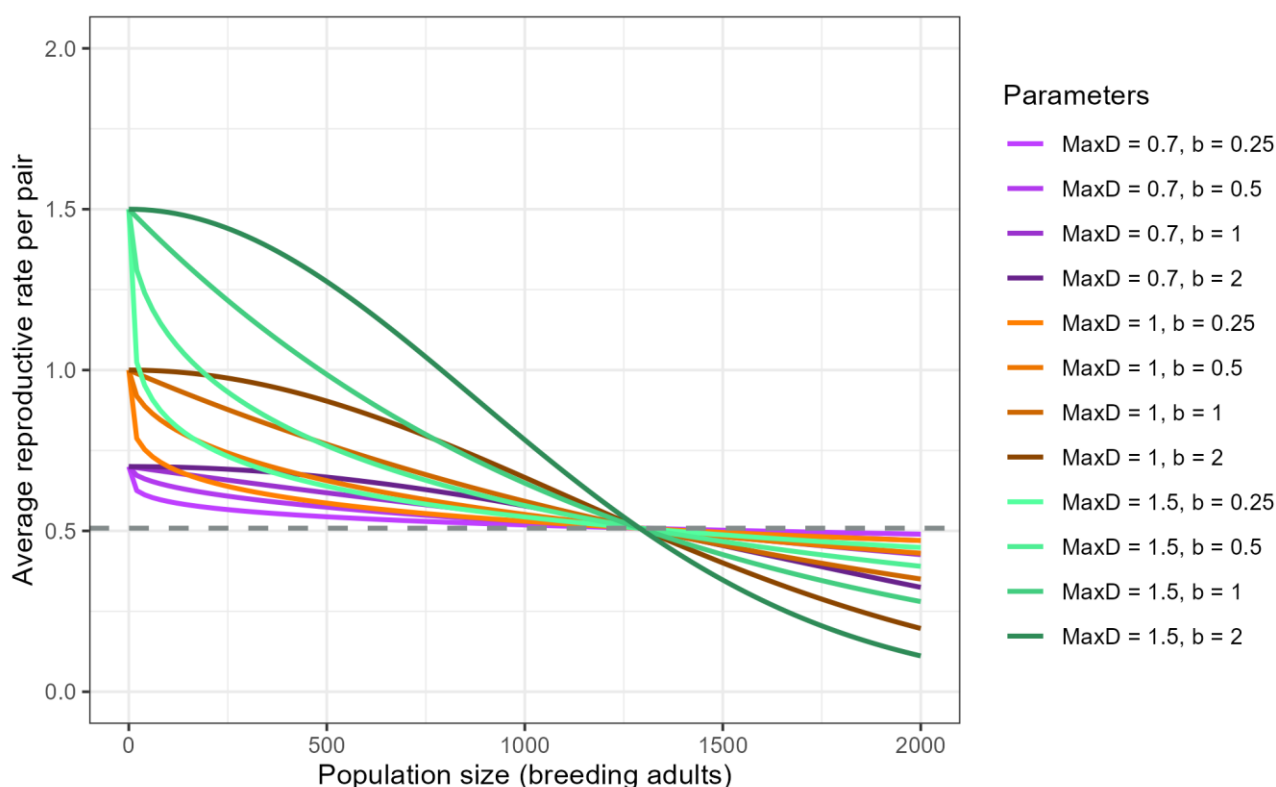


Plate A Effect of density dependence on reproductive rate – reproductive rate at different population sizes. Grey dashed line indicates the reproductive rate used in density independent modelling and where curves intersect this line represents the assumed carrying capacity taken as the 2023 breeding population of 1,290 breeding adults.

6. Density dependent PVAs were undertaken as described within **Volume 7, Appendix 4** of the NIS, with proportional impact parameters to the Wicklow Head SPA breeding kittiwake population altered to those shown in **Table**, above, and, as requested in relation to RFI item 7t, productivity parameter

settings within the Natural England PVA tool changed from the 'Global' figure (0.60363 +/- 0.32578 fledglings per pair) to the 'Irish Sea, Reg.Seas' figure (0.50842 +/- 0.28982 fledglings per pair).

Table 19 Counterfactual of population size value density dependent PVA outputs for in-combination collision impacts to the breeding kittiwake population from Wicklow Head SPA for a range of density dependence scenarios.

Parameters relating to strength of compensatory density dependence		Scale parameter for Weibull distribution (a) [provided to permit model validation]	Baseline population size (corresponding with 25 years of impact for counterfactual populations)	Final population size after 25 years of impact (breeding pairs)			Counterfactual of Population Size after 25 years of impact		
Maximum reproductive rate (in the absence of competitive effects) (MaxD)	Weibull distribution shape parameter (b)			CWP	Tier 1 excluding CWP	Tier 1 with CWP	CWP	Tier 1 excluding CWP	Tier 1 with CWP
0.7 (extremely limited additional productivity in the absence of competitive effects)	0.25 (least strong)	0.05335670	424	418	360	355	0.987	0.848	0.838
	0.5	0.00890311	435	430	373	369	0.988	0.856	0.848
	1	0.00024788	453	449	394	391	0.990	0.870	0.862
	2 (most strong)	0.00000019	478	475	426	422	0.994	0.892	0.882
1 (moderate additional productivity in the absence of competitive effects)	0.25 (least strong)	0.11287153	439	434	377	372	0.989	0.858	0.848
	0.5	0.01883376	463	458	405	401	0.990	0.876	0.868
	1	0.00052438	501	497	451	448	0.992	0.901	0.895
	2 (most strong)	0.00000041	547	544	510	508	0.994	0.933	0.928
1.5 (strong additional productivity in the absence of competitive effects)	0.25 (least strong)	0.18052749	455	450	396	391	0.990	0.872	0.861
	0.5	0.03012284	491	487	441	437	0.992	0.897	0.889
	1	0.00083869	542	539	504	502	0.995	0.930	0.925
	2 (most strong)	0.00000065	587	585	564	562	0.997	0.962	0.958

2.2.2 Herring gull

Table 20 Predicted annual mortalities apportioned by relevant projects to breeding adult herring gull SPA populations screened in to in-combination assessment from collision impacts

Project	Tier	Estimated collision mortality to SPA population (breeding adults)			Notes
		Ireland's Eye SPA	Lambay Island SPA	Skerries Island SPA	
Awel y Mor	1	0.00	0.00	0.00	No updated information since CWP submission in September 2024. Figures as original CWP In-combination assessment
Erebus	1	0.00	0.00	0.00	
Mona	1	0.00	0.00	0.00	Updated information since CWP submission in September 2024. Figures as published by each project.
Morgan	1	0.00	0.10	0.00	
Morecambe	1	0.00	0.00	0.00	
Moor Vannin	1	0.00	0.09	0.00	
Llyr 1	1	0.00	0.00	0.00	
Oriel	1	0.65	2.37	0.00	
Arklow	1	0.05	0.16	0.04	
NISA	1	0.34	1.64	0.03	
Dublin	1	1.04	1.27	0.01	
In-combination impact to SPA population without Codling		2.08	5.63	0.08	
CWP		0.81	1.70	0.01	
In-combination impact to SPA population with Codling		2.89	7.33	0.09	

Table 21 Calculation of increase to SPA breeding adult herring gull mortality rate resultant from in-combination collision impacts and consideration of requirement for PVA when determining the potential for AESI

SPA	Ireland's Eye SPA	Lambay Island SPA	Skerries Islands SPA	North-west Irish Sea
Breeding population	636	1812	20	2468* ¹
Baseline adult annual mortality rate	16.60%	16.60%	16.60%	16.60%
SPA mortalities per annum	105.58	300.79	3.32	409.69

SPA	Ireland's Eye SPA	Lambay Island SPA	Skerries Islands SPA	North-west Irish Sea
% increase to SPA population annual mortality				
CWP only	0.77%	0.56%	0.39%	0.62%* ²
Tier 1 (excluding CWP)	1.97%	1.87%	2.41%	1.90%
Tier 1 + CWP	2.74%	2.44%	2.80%	2.52%
PVA requirement				
Does increase to regional mortality exceed 1%?	Yes	Yes	No* ³	Yes

*¹ Sum of Ireland's Eye, Lambay Island and Skerries Islands breeding populations.

*² From sum of impacts to Ireland's Eye, Lambay Island and Skerries Islands breeding populations.

*³ SPA population of 20 breeding individuals is considered too small to allow use of PVA.

Table 22 Proportional in-combination collision impact survival rate inputs to breeding herring gull SPAs for PVA

SPA	Ireland's Eye SPA	Lambay Island SPA	North-west Irish Sea SPA
CWP only	0.00128	0.00094	0.00102
Tier 1 (excluding CWP)	0.00327	0.00311	0.00316
Tier 1 + CWP	0.00455	0.00404	0.00418

Table 23 Herring gull SPA In-combination collision impact PVA counterfactual outputs. (CGR = Counterfactual of population Growth Rate; CPS = Counterfactual of Population Size)

SPA	Ireland's Eye SPA		Lambay Island SPA		North-west Irish Sea SPA	
Counterfactual	CGR	CPS	CGR	CPS	CGR	CPS
CWP only	0.998	0.964	0.999	0.973	0.999	0.968
Tier 1 (excluding CWP)	0.996	0.902	0.996	0.906	0.996	0.906
Tier 1 + CWP	0.994	0.868	0.995	0.882	0.995	0.878

Annex A - Population Viability Analysis Parameter logs

PVAs for CEA

Collision

Kittiwake

Set up

The log file was created on: 2026-02-04 13:41:22 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: Black-Legged Kittiwake.

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: 4.

Is there an upper constraint on productivity in the model?: Yes, constrained to 2 per pair.

Number of subpopulations: 1.

Are demographic rates applied separately to each subpopulation?: No.

Units for initial population size: all.individuals

Are baseline demographic rates specified separately for immatures?: Yes.

Population 1

Initial population values: Initial population 933172 in 2023

Productivity rate per pair: mean: 0.5084217 , sd: 0.2898223

Adult survival rate: mean: 0.854 , sd: 0.077

Immatures survival rates:

Age class 0 to 1 - mean: 0.79 , sd: 0.077 , DD: NA

Age class 1 to 2 - mean: 0.854 , sd: 0.077 , DD: NA

Age class 2 to 3 - mean: 0.854 , sd: 0.077 , DD: NA

Age class 3 to 4 - mean: 0.854 , sd: 0.077 , 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: CWP ONLY

All subpopulations

Impact on productivity rate mean: 0 , se: NA

Impact on adult survival rate mean: 2e-05 , se: NA

Scenario B - Name: TIER 1 EXCLUDING CWP

All subpopulations

Impact on productivity rate mean: 0 , se: NA

Impact on adult survival rate mean: 9e-04 , se: NA

Scenario C - Name: TIER 1 WITH CWP

All subpopulations

Impact on productivity rate mean: 0 , se: NA

Impact on adult survival rate mean: 0.00092 , se: NA

Output:

First year to include in outputs: 2023

Final year to include in outputs: 2053

How should outputs be produced, in terms of ages?: whole.population

Target population size to use in calculating impact metrics: NA

Quasi-extinction threshold to use in calculating impact metrics: NA

Great black-backed gull

Set up

The log file was created on: 2026-02-04 13:54:55 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: Great Black-Backed Gull.

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 3 per pair.

Number of subpopulations: 1.

Are demographic rates applied separately to each subpopulation?: No.

Units for initial population size: all.individuals

Are baseline demographic rates specified separately for immatures?: Yes.

Population 1

Initial population values: Initial population 53405 in 2023

Productivity rate per pair: mean: 1.011012 , sd: 0.4724585

Adult survival rate: mean: 0.93 , sd: 0.001

Immatures survival rates:

Age class 0 to 1 - mean: 0.93 , sd: 0.001 , DD: NA

Age class 1 to 2 - mean: 0.93 , sd: 0.001 , DD: NA

Age class 2 to 3 - mean: 0.93 , sd: 0.001 , DD: NA

Age class 3 to 4 - mean: 0.93 , sd: 0.001 , DD: NA

Age class 4 to 5 - mean: 0.93 , sd: 0.001 , 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: CWP ONLY

All subpopulations

Impact on productivity rate mean: 0 , se: NA

Impact on adult survival rate mean: 8e-05 , se: NA

Scenario B - Name: TIER 1 EXCLUDING CWP

All subpopulations

Impact on productivity rate mean: 0 , se: NA

Impact on adult survival rate mean: 0.00285 , se: NA

Scenario C - Name: TIER 1 WITH CWP

All subpopulations

Impact on productivity rate mean: 0 , se: NA

Impact on adult survival rate mean: 0.00293 , se: NA

Output:

First year to include in outputs: 2023

Final year to include in outputs: 2053

How should outputs be produced, in terms of ages?: whole.population

Target population size to use in calculating impact metrics: NA

Quasi-extinction threshold to use in calculating impact metrics: NA

Herring gull

Set up

The log file was created on: 2026-02-04 14:31:24 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: Herring Gull.

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 3 per pair.

Number of subpopulations: 1.

Are demographic rates applied separately to each subpopulation?: No.

Units for initial population size: all.individuals

Are baseline demographic rates specified separately for immatures?: Yes.

Population 1

Initial population values: Initial population 187090 in 2023

Productivity rate per pair: mean: 0.6375871 , sd: 0.3789584

Adult survival rate: mean: 0.834 , sd: 0.079

Immatures survival rates:

Age class 0 to 1 - mean: 0.794 , sd: 0.079 , DD: NA

Age class 1 to 2 - mean: 0.834 , sd: 0.079 , DD: NA

Age class 2 to 3 - mean: 0.834 , sd: 0.079 , DD: NA

Age class 3 to 4 - mean: 0.834 , sd: 0.079 , DD: NA

Age class 4 to 5 - mean: 0.834 , sd: 0.079 , 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: CWP ONLY

All subpopulations

Impact on productivity rate mean: 0 , se: NA

Impact on adult survival rate mean: 0.00015 , se: NA

Scenario B - Name: TIER 1 EXCLUDING CWP

All subpopulations

Impact on productivity rate mean: 0 , se: NA

Impact on adult survival rate mean: 0.00167 , se: NA

Scenario C - Name: TIER 1 WITH CWP

All subpopulations

Impact on productivity rate mean: 0 , se: NA

Impact on adult survival rate mean: 0.00182 , se: NA

Output:

First year to include in outputs: 2023

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

PVAs for In-combination Assessment

Displacement

Guillemot - Ireland's Eye SPA

Set up

The log file was created on: 2026-02-04 14:42:51 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: CWP ONLY

All subpopulations

Impact on productivity rate mean: 0 , se: NA

Impact on adult survival rate mean: 2e-04 , se: NA

Scenario B - Name: TIER 1 EXCLUDING CWP

All subpopulations

Impact on productivity rate mean: 0 , se: NA

Impact on adult survival rate mean: 0.00168 , se: NA

Scenario C - Name: TIER 1 WITH CWP

All subpopulations

Impact on productivity rate mean: 0 , se: NA

Impact on adult survival rate mean: 0.00188 , 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

Guillemot - Lambay Island SPA

Set up

The log file was created on: 2026-02-04 14:52:55 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: CWP ONLY

All subpopulations

Impact on productivity rate mean: 0 , se: NA

Impact on adult survival rate mean: 0.00016 , se: NA

Scenario B - Name: TIER 1 EXCLUDING CWP

All subpopulations

Impact on productivity rate mean: 0 , se: NA

Impact on adult survival rate mean: 0.00122 , se: NA

Scenario C - Name: TIER 1 WITH CWP

All subpopulations

Impact on productivity rate mean: 0 , se: NA

Impact on adult survival rate mean: 0.00137 , 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

Razorbill - Ireland's Eye SPA

Set up

The log file was created on: 2026-02-04 15:48:14 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: CWP ONLY

All subpopulations

Impact on productivity rate mean: 0 , se: NA

Impact on adult survival rate mean: 2e-04 , se: NA

Scenario B - Name: TIER 1 EXCLUDING CWP

All subpopulations

Impact on productivity rate mean: 0 , se: NA

Impact on adult survival rate mean: 0.00111 , se: NA

Scenario C - Name: TIER 1 WITH CWP

All subpopulations

Impact on productivity rate mean: 0 , se: NA

Impact on adult survival rate mean: 0.00131 , 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

Razorbill – Lambay Island SPA

Set up

The log file was created on: 2026-02-04 15:55:28 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 7353 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: CWP ONLY

All subpopulations

Impact on productivity rate mean: 0 , se: NA

Impact on adult survival rate mean: 0.00016 , se: NA

Scenario B - Name: TIER 1 EXCLUDING CWP

All subpopulations

Impact on productivity rate mean: 0 , se: NA

Impact on adult survival rate mean: 0.00103 , se: NA

Scenario C - Name: TIER 1 WITH CWP

All subpopulations

Impact on productivity rate mean: 0 , se: NA

Impact on adult survival rate mean: 0.00119 , 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

Collision

Kittiwake - Wicklow Head SPA

Set up

The log file was created on: 2026-02-04 16:19:18 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: Black-Legged Kittiwake.

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: 4.

Is there an upper constraint on productivity in the model?: Yes, constrained to 2 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 1290 in 2023

Productivity rate per pair: mean: 0.5084217 , sd: 0.2898223

Adult survival rate: mean: 0.854 , sd: 0.077

Immatures survival rates:

Age class 0 to 1 - mean: 0.79 , sd: 0.077 , DD: NA

Age class 1 to 2 - mean: 0.854 , sd: 0.077 , DD: NA

Age class 2 to 3 - mean: 0.854 , sd: 0.077 , DD: NA

Age class 3 to 4 - mean: 0.854 , sd: 0.077 , 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: CWP ONLY

All subpopulations

Impact on productivity rate mean: 0 , se: NA

Impact on adult survival rate mean: 0.00044 , se: NA

Scenario B - Name: TIER 1 EXCLUDING CWP

All subpopulations

Impact on productivity rate mean: 0 , se: NA

Impact on adult survival rate mean: 0.00579 , se: NA

Scenario C - Name: TIER 1 WITH CWP

All subpopulations

Impact on productivity rate mean: 0 , se: NA

Impact on adult survival rate mean: 0.00623 , se: NA

Output:

First year to include in outputs: 2023

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

Kittiwake - Howth Head Coast SPA

Set up

The log file was created on: 2026-02-04 16:34:24 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: Black-Legged Kittiwake.

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: 4.

Is there an upper constraint on productivity in the model?: Yes, constrained to 2 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 3546 in 2018

Productivity rate per pair: mean: 0.5084217 , sd: 0.2898223

Adult survival rate: mean: 0.854 , sd: 0.077

Immatures survival rates:

Age class 0 to 1 - mean: 0.79 , sd: 0.077 , DD: NA

Age class 1 to 2 - mean: 0.854 , sd: 0.077 , DD: NA

Age class 2 to 3 - mean: 0.854 , sd: 0.077 , DD: NA

Age class 3 to 4 - mean: 0.854 , sd: 0.077 , 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: CWP ONLY

All subpopulations

Impact on productivity rate mean: 0 , se: NA

Impact on adult survival rate mean: 1e-04 , se: NA

Scenario B - Name: TIER 1 EXCLUDING CWP

All subpopulations

Impact on productivity rate mean: 0 , se: NA

Impact on adult survival rate mean: 0.00231 , se: NA

Scenario C - Name: TIER 1 WITH CWP

All subpopulations

Impact on productivity rate mean: 0 , se: NA

Impact on adult survival rate mean: 0.00242 , se: NA

Output:

First year to include in outputs: 2018

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

Kittiwake - Ireland's Eye SPA

Set up

The log file was created on: 2026-02-04 16:43:54 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: Black-Legged Kittiwake.

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: 4.

Is there an upper constraint on productivity in the model?: Yes, constrained to 2 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 802 in 2015

Productivity rate per pair: mean: 0.5084217 , sd: 0.2898223

Adult survival rate: mean: 0.854 , sd: 0.077

Immatures survival rates:

Age class 0 to 1 - mean: 0.79 , sd: 0.077 , DD: NA

Age class 1 to 2 - mean: 0.854 , sd: 0.077 , DD: NA

Age class 2 to 3 - mean: 0.854 , sd: 0.077 , DD: NA

Age class 3 to 4 - mean: 0.854 , sd: 0.077 , 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: CWP ONLY

All subpopulations

Impact on productivity rate mean: 0 , se: NA

Impact on adult survival rate mean: 1e-04 , se: NA

Scenario B - Name: TIER 1 EXCLUDING CWP

All subpopulations

Impact on productivity rate mean: 0 , se: NA

Impact on adult survival rate mean: 0.00289 , se: NA

Scenario C - Name: TIER 1 WITH CWP

All subpopulations

Impact on productivity rate mean: 0 , se: NA

Impact on adult survival rate mean: 0.00299 , 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

Kittiwake - Lambay Island SPA

Set up

The log file was created on: 2026-02-04 16:49:28 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: Black-Legged Kittiwake.

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: 4.

Is there an upper constraint on productivity in the model?: Yes, constrained to 2 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 6640 in 2015

Productivity rate per pair: mean: 0.5084217 , sd: 0.2898223

Adult survival rate: mean: 0.854 , sd: 0.077

Immatures survival rates:

Age class 0 to 1 - mean: 0.79 , sd: 0.077 , DD: NA

Age class 1 to 2 - mean: 0.854 , sd: 0.077 , DD: NA

Age class 2 to 3 - mean: 0.854 , sd: 0.077 , DD: NA

Age class 3 to 4 - mean: 0.854 , sd: 0.077 , 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: CWP ONLY

All subpopulations

Impact on productivity rate mean: 0 , se: NA

Impact on adult survival rate mean: 8e-05 , se: NA

Scenario B - Name: TIER 1 EXCLUDING CWP

All subpopulations

Impact on productivity rate mean: 0 , se: NA

Impact on adult survival rate mean: 0.00181 , se: NA

Scenario C - Name: TIER 1 WITH CWP

All subpopulations

Impact on productivity rate mean: 0 , se: NA

Impact on adult survival rate mean: 0.00189 , 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

Kittiwake – North-west Irish Sea SPA

Set up

The log file was created on: 2026-02-06 10:26:23 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: Black-Legged Kittiwake.

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: 4.

Is there an upper constraint on productivity in the model?: Yes, constrained to 2 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 10988 in 2018

Productivity rate per pair: mean: 0.5084217 , sd: 0.2898223

Adult survival rate: mean: 0.854 , sd: 0.077

Immatures survival rates:

Age class 0 to 1 - mean: 0.79 , sd: 0.077 , DD: NA

Age class 1 to 2 - mean: 0.854 , sd: 0.077 , DD: NA

Age class 2 to 3 - mean: 0.854 , sd: 0.077 , DD: NA

Age class 3 to 4 - mean: 0.854 , sd: 0.077 , 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: CWP ONLY

All subpopulations

Impact on productivity rate mean: 0 , se: NA

Impact on adult survival rate mean: 9e-05 , se: NA

Scenario B - Name: TIER 1 EXCLUDING CWP

All subpopulations

Impact on productivity rate mean: 0 , se: NA

Impact on adult survival rate mean: 0.00205 , se: NA

Scenario C - Name: TIER 1 WITH CWP

All subpopulations

Impact on productivity rate mean: 0 , se: NA

Impact on adult survival rate mean: 0.00214 , se: NA

Output:

First year to include in outputs: 2018

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

Herring gull - Ireland's Eye SPA

Set up

The log file was created on: 2026-02-05 11:28:46 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: Herring Gull.

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 3 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 636 in 2015

Productivity rate per pair: mean: 0.6375871 , sd: 0.3789584

Adult survival rate: mean: 0.834 , sd: 0.079

Immatures survival rates:

Age class 0 to 1 - mean: 0.794 , sd: 0.079 , DD: NA

Age class 1 to 2 - mean: 0.834 , sd: 0.079 , DD: NA

Age class 2 to 3 - mean: 0.834 , sd: 0.079 , DD: NA

Age class 3 to 4 - mean: 0.834 , sd: 0.079 , DD: NA

Age class 4 to 5 - mean: 0.834 , sd: 0.079 , 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: CWP ONLY

All subpopulations

Impact on productivity rate mean: 0 , se: NA

Impact on adult survival rate mean: 0.00128 , se: NA

Scenario B - Name: TIER 1 EXCLUDING CWP

All subpopulations

Impact on productivity rate mean: 0 , se: NA

Impact on adult survival rate mean: 0.00327 , se: NA

Scenario C - Name: TIER 1 WITH CWP

All subpopulations

Impact on productivity rate mean: 0 , se: NA

Impact on adult survival rate mean: 0.00455 , 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

Herring gull - Lambay Island SPA

Set up

The log file was created on: 2026-02-05 11:36:38 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: Herring Gull.

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 3 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 1812 in 2015

Productivity rate per pair: mean: 0.6375871 , sd: 0.3789584

Adult survival rate: mean: 0.834 , sd: 0.079

Immatures survival rates:

Age class 0 to 1 - mean: 0.794 , sd: 0.079 , DD: NA

Age class 1 to 2 - mean: 0.834 , sd: 0.079 , DD: NA

Age class 2 to 3 - mean: 0.834 , sd: 0.079 , DD: NA

Age class 3 to 4 - mean: 0.834 , sd: 0.079 , DD: NA

Age class 4 to 5 - mean: 0.834 , sd: 0.079 , 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: CWP ONLY

All subpopulations

Impact on productivity rate mean: 0 , se: NA

Impact on adult survival rate mean: 0.00094 , se: NA

Scenario B - Name: TIER 1 EXCLUDING CWP

All subpopulations

Impact on productivity rate mean: 0 , se: NA

Impact on adult survival rate mean: 0.00311 , se: NA

Scenario C - Name: TIER 1 WITH CWP

All subpopulations

Impact on productivity rate mean: 0 , se: NA

Impact on adult survival rate mean: 0.00404 , 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

Herring gull – North-west Irish Sea SPA

Set up

The log file was created on: 2026-02-06 10:36:31 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: Herring Gull.

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 3 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 2468 in 2015

Productivity rate per pair: mean: 0.6375871 , sd: 0.3789584

Adult survival rate: mean: 0.834 , sd: 0.079

Immatures survival rates:

Age class 0 to 1 - mean: 0.794 , sd: 0.079 , DD: NA

Age class 1 to 2 - mean: 0.834 , sd: 0.079 , DD: NA

Age class 2 to 3 - mean: 0.834 , sd: 0.079 , DD: NA

Age class 3 to 4 - mean: 0.834 , sd: 0.079 , DD: NA

Age class 4 to 5 - mean: 0.834 , sd: 0.079 , 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: CWP ONLY

All subpopulations

Impact on productivity rate mean: 0 , se: NA

Impact on adult survival rate mean: 0.00102 , se: NA

Scenario B - Name: TIER 1 EXCLUDING CWP

All subpopulations

Impact on productivity rate mean: 0 , se: NA

Impact on adult survival rate mean: 0.00316 , se: NA

Scenario C - Name: TIER 1 WITH CWP

All subpopulations

Impact on productivity rate mean: 0 , se: NA

Impact on adult survival rate mean: 0.00418 , se: NA

Output:

First year to include in outputs: 2018

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