

Arklow Bank Wind Park 2

Natura Impact Statement: Stage 2 Appraisal to Inform an Appropriate Assessment of Implications on European Sites

sse Renewables

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Glossary

Term	Meaning
ABWP2 (the Project)	Arklow Bank Wind Park 2 (ABWP2) (The Project) is the onshore and offshore infrastructure. This NIS is being prepared for the Offshore Infrastructure. Consents for the Onshore Grid Infrastructure (Planning Reference 310090) and Operations Maintenance Facility (Planning Reference 211316) has been granted on 26th May 2022 and 20th July 2022, respectively. • Arklow Bank Wind Park 2 Offshore Infrastructure: This includes all elements to be consented in accordance with the Maritime Area Consent. This is the subject of this NIS and will be referred to as 'the Proposed Development' in the NIS. • Arklow Bank Wind Park 2 Onshore Grid Infrastructure (OGI): This relates to the onshore grid infrastructure for which planning approval has been granted. • Arklow Bank Wind Park 2 Operations and Maintenance Facility (OMF): This includes the onshore and nearshore infrastructure at the OMF, for which planning permission has been granted. • Arklow Bank Wind Park 2 EirGrid Upgrade Works: any non-contestable grid upgrade works, consent to be sought and works to be completed by EirGrid.
Arklow Bank Wind Park 1 (ABWP1)	Arklow Bank Wind Park 1 consists of seven wind turbines, offshore export cable and inter-array cables. Arklow Bank Wind Park 1 has a capacity of 25.2 MW. Arklow Bank Wind Park 1 was constructed in 2003/04 and is owned and operated by Arklow Energy Limited. It remains the first and only operational offshore windfarm in Ireland.
Arklow Bank Wind Park 2 (ABWP2)– Offshore Infrastructure	"The Proposed Development", Arklow Bank Wind Park 2 Offshore Infrastructure: This includes all elements under the existing Maritime Area Consent.
Array Area	The Array Area is the area within which the Wind Turbine Generators (WTGs), the Offshore Substation Platforms (OSPs), and associated cables (export, inter- array and interconnector cabling) and foundations will be installed.
Bathymetry	The measurement of water depth in oceans, seas and lakes.
Benthic ecology	Benthic ecology encompasses the study of the organisms living in and on the sea floor, the interactions between them and impacts on the surrounding environment.
Biotope	The combination of physical environment (habitat) and its distinctive assemblage of conspicuous species.
Cable Corridor and Working Area	The Cable Corridor and Working Area is the area within which export, inter-array and interconnector cabling will be installed. This area will also facilitate vessel jacking operations associated with installation of WTG structures and associated foundations within the Array Area.
Cable protection	External armouring applied to exposed cables or used at cable crossings, typically comprised of rock (berms or bags), ducting (polyurethane, steel, High Density Polyethylene (HDPE), cast iron or plastic) or concrete mattresses.
Competent Authority (CA)	The authority designated as responsible for performing the duties arising from the EIA Directive as amended. For this application, the Competent Authority is An ~~Bord~~Coimisiún Pleanála (~~ABP).~~ACP)
Concrete mattressing	A solution for providing protection to cables from dropped objects, fishing trawl boards and scour (Subsea Protection Systems, 2020). Typically, several metres wide and long, cast of articulated concrete blocks which are linked by a polypropylene rope lattice which are placed on and/or around structures to stabilise the seabed and inhibit erosion.

Term	Meaning
Construction phase	The period during which project infrastructure is being installed.
Decommissioning phase	The period during which Proposed Development infrastructure is being removed at the end of the operational lifetime of Proposed Development.
EirGrid	State-owned electric power transmission system operator (TSO) in Ireland and Transmission Asset Owner (TAO) for the Project's transmission assets.
Environmental Impact Assessment (EIA)	An Environmental Impact Assessment (EIA) is a statutory process by which certain planned projects must be assessed before a formal decision to proceed can be made. It involves the collection and consideration of environmental information, which fulfils the assessment requirements of the Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment as amended by Directive 2014/52/EU of the European Parliament and of the Council (EIA Directive).
Foreshore	The bed and shore, below the line of high water of ordinary or medium tides, of the sea and of every tidal river and tidal estuary and of every channel, creek, and bay of the sea or of any such river or estuary including the subsoil below, and the water column above the bed and shore and extending to the 12 nautical mile limit.
Foundation	The load carrying support structure for the wind turbine generator tower or offshore substation platform topside. The foundation is the part of the structure from the interfacing flange with the turbine tower or topside-foundation interface, down to below seabed. This includes any secondary steel items associated with the structure. For the purposes of the NIS the term 'foundation' includes the structure from the WTG tower or topside interface down to the lower end of the monopile commonly known as the 'substructure' and encompasses monopiles and transition pieces.
Habitats Directive	Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (Habitats Directive).
Indirect Impact	'Impacts on the environment, which are not a direct result of the Project, often produced away from (the site) or as a result of a complex pathway' (EPA, 2022).
Infauna	The animals living in the sediments of the seabed.
Intertidal area	The area between the high water mark (HWM) and the low water mark (LWM).
Landfall	The area in which the offshore export cables make landfall and is the transitional area between the offshore cabling and the onshore cabling.
Magnitude	Size, extent and duration of an impact.
Management Unit (MU)	A defined geographical area where a particular species can be found, and the management of human activities is applied.
Maritime Area Consent (MAC)	A consent to occupy a specific part of the maritime area on a non-exclusive basis for the purpose of carrying out a Permitted Maritime Usage strictly in accordance with the conditions attached to the MAC granted on 22nd December 2022 with reference number 2022-MAC-002.
Mitigation Measure	Measure which would avoid, reduce, or offset an impact.
Natura Impact Statement (NIS)	A statement, for the purpose of Article 6 of the Habitats Directive, of the implications of a Proposed Development, on its own or in combination with other plans or projects, for one or more than one European site, in view of the conservation objectives of the site or sites.

Term	Meaning
Permitted Maritime Usage	The construction and operation of an offshore windfarm and associated infrastructure (including decommissioning and other works required on foot of any permission for such offshore windfarm).
Polychaete	A class of segmented worms often known as bristle worms.
Scour protection	A solution for preventing scour around subsea structures, typically comprised of rock or concrete mattresses.
Sensitive Receptor	Physical or natural resource, special interest or viewer group that may experience an impact.
Sensitivity	Vulnerability of a sensitive receptor to change.
Sound Exposure Level (SEL)	A measure of the total sound energy of an event normalised to one second. This allows the total acoustic energy contained in events lasting a different amount of time to be compared on a like-for-like basis.
Sound Pressure Level (SPL)	The measurement of sound pressure in decibels (dB).
Study Area (upper case)	The area which is characterised dependant on the survey and receptor type of the focus of the study.
Subtidal area	The area below Mean Low Water Springs (MLWS).
The Application	The full set of documents that will be submitted to An Bord Pleanála in support of the consent application.
The Developer	Sure Partners Ltd.
Trenchless techniques	Trenchless techniques include steerable direct pipe thrusting (“Direct Pipe”) and Horizontal Directional Drilling (HDD) which allow cable ducts to be installed underground without the need to excavate trenches.
Transition Piece (TP)	Structural interface between monopile foundation and WTG tower that contains ancillary infrastructure such as boat landings, working platform and j tubes.
Water Body	A surface water body as defined under Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy, as amended, the Water Framework Directive i.e., a river/stream, lake, transitional, coastal or groundwater body.
Zone of Influence	Areas within which environmental impact may occur – to be defined for each receptor by technical specialists

Acronyms

Term	Meaning
AA	Appropriate Assessment
ABP	An Bord Pleanála
ABWP1	Arklow Bank Wind Park 1
ABWP2	Arklow Bank Wind Park 2
AC	Alternating Current
ADCP	Acoustic Doppler Current Profiler
AEoI	Adverse Effects on Integrity
AL	Action Level
AOB	Apparently occupied burrow
AON	Apparently occupied nests
ASL	Above sea level
ASU	Aquatic Services Unit
BDMPS	Biologically defined minimum population scale
BEIS	Department of Business, Energy, and Industrial Strategy
CAP	Climate Action Plan
CL	Conservation Limit
CO	Conservation Objectives
CJEU	Court of Justice of the European Union
CPGR	Counterfactual of population growth rate
CPS	Counterfactual of population size
CPT	Cone penetration test
CRM	Collision risk model
CSA	Continental Shelf Associates
cSACs	Candidate Special Areas of Conservation
CSIP	Cetacean Stranding Investigation Programme
cSPAs	Candidate Special Protected Areas
DAS	Digital Arial Survey

Term	Meaning
DCCAE	Department of Communications, Climate Action and Environment
DEHLG	Department of the Environment, Heritage and Local Government
DMAP	Designated Maritime Area Plan
DP	Decommissioning Plan
EC	European Commission
EDR	Effective deterrence range
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EMF	Electro Magnetic Field
EMP	Environmental Management Plan
EPA	Environmental Protection Agency
~~EPS~~	~~European Protected Species~~
EU	European Union
EUNIS	The European Nature Information System
~~EVMP~~	~~Environmental Vehicle Management Plan~~
FCS	Favourable Conservation Status
GCA	Grid connection assessment
GPS	Global positioning system
GSD	Ground sample distance
HDD	Horizontal Directional Drilling
HF	High frequency
HRA	Habitat Regulations Assessment
HVAC	High Voltage Alternating Current
HVDC	High Voltage Direct Current
HWM	High Water Mark
IRCG	Irish Coast Guard
IMO	International Maritime Organisation
JNCC	Joint Nature Conservation Committee
LAT	Lowest Astronomical Tide

Term	Meaning
LiDAR	Light Detection and Ranging
LSE	Likely Significant Effects
MAC	Maritime Area Consent
MBES	MultiBeam Echosounder
MMMP	Marine Mammal Mitigation Plan
MMO	Marine Mammal Observer
MPCP	Marine Pollution Contingency Plan
MPDM	Marine Planning and Development Management
MU	Management Unit
NDP	Network Delivery Portfolio
NIS	Natura Impact Statement
NPWS	National Parks and Wildlife Service
OGI	Onshore Grid Infrastructure
OHL	Overhead line
O&M	Operational and Maintenance
OMF	Operations and Maintenance Facility
OPR	Office of the Planning Regulator
OPW	Office of Public Works
ORE	Offshore Renewable Energy
OSP	Offshore Substation Platforms
OWF	Offshore Windfarm
PDA	Planning and Development Act
PTS	Permanent threshold shift
PVA	Population viability assessment
QI	Qualifying Interests
RMS	Root mean square
RPM	Revolutions per minute
RSPB	Royal Society for the Protection of Birds
SAC	Special Areas of Conservation

Term	Meaning
SBP	Sub-bottom profiler
SCI	Sites of Community Importance
SEL	Sound Exposure Level
SID	Strategic Infrastructure Development
SISAA	Supporting Information for Screening for AA
SNCBs	Statutory Nature Conservation Bodies
SOEF	Shaping Our Electricity Future
SPA	Special Protected Areas
SPL	Sound Pressure level
SSC	Suspended sediment concentrations
SSCO	Site specific conservation objectives
SSD	Suspended sediment deposition
SSS	Side scan sonar
SW	South-west
TAO	Transmission Asset Owner
TSHD	Trailing Suction Hopper Dredger
TTS	Temporary threshold shift
UK	United Kingdom
USA	United States of America
UWN	Underwater Noise
UXO	Un-exploded ordinance
VHF	Very High Frequency
VP	Vantage point
WTG	Wind Turbine Generator

Units

Unit	Description
%	Percent
<	Less than
>	More than
°	degrees
A	Amperes
CO_{2eq}	Carbon dioxide equivalent
dB	Decibel (unit used to measure the intensity of sound)
hrs	Hours
Hz	Hertz
kHz	kiloHertz
kJ	Kilojoules
km	Kilometre
km^2	Kilometres square
kn	Knots
kV	Kilovolt (electrical potential)
m	Metre
m/s	Metres per second
mG	milligauss
mg/l	Milligrams per litre
mV/m	millivolts per ~~metrer~~metre
MW	Megawatt (power; equal to one million watts)
nm	Nautical Mile (distance; equal to 1.852 km)
Pa	Pascal
V/m	Volts per metre
µT	Microtesla
µPa	Micropascal
µV/m	Microvolts per metre

Summary of Changes

This document has been updated to reflect changes and updates since submission of the original Natura Impact Statement: Stage 2 Appraisal to Inform an Appropriate Assessment of Implications on European Sites to An Bord Pleanála (ABP) (now An Coimisiún Pleanála (ACP)) in June 2024. All references to ABP, should be considered ACP throughout the document.

This document has been updated to align with revisions to NIS Volume I: Supporting Information for Screening for Appropriate Assessment (Revised March 2026) made in response to the Requests for Further Information (RFI). The reader should refer to NIS Volume I: Supporting Information for Screening for Appropriate Assessment (Revised March 2026) in the first instance, as it provides the context and screening updates that underpin many of the RFIs addressed within this document. All relevant RFI-related changes specific to this document are summarised below. Notably, updates to the NIS Volume I: Supporting Information for Screening for Appropriate Assessment (Revised March 2026) have resulted in one additional SPA (The Murrough SPA) being screened in for Stage 2 Appropriate Assessment within this document.

In relation to RFI (1a, 1b and 1c):

- The Applicant confirms that this document has been updated to reflect the latest legislation, data sources, and site-specific information, providing an up-to-date assessment, as follows:
  - Section 2.2 *Legislative and the Appropriate Assessment procedure* in Ireland has been reviewed to ensure that all references are current and accurate within the context of the Habitats Directive in Ireland;
  - Table 5.1 and Table 5.2 now include all updates to the Conservation Objectives for the screened-in Qualifying Interests (QIs) at the relevant Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) that have been published since the original submission, using the most up-to-date information available as of January 2026.
  - Section 6.1 *Baseline Information to Inform Stage 2 Annex I Coastal and Marine Habitat QIs* has been revised to incorporate updated desk-based data sources and reference new site-specific geophysical and benthic surveys;
  - Section below 6.3 *Baseline Information to Inform Stage 2 for Annex II Marine Mammal Species QIs* has been revised to incorporate updated desk-based data sources and reference new site-specific Digital Aerial Surveys (DAS) and Seal Vantage Point (VP) surveys;
  - Section 6.5 *Baseline Information to Inform Stage 2 AA for Migratory fish Species QIs* has been reviewed with the consideration of updated desk-based data sources; and
  - Section 6.7 *Baseline Information to Inform Stage 2 for AA for Intertidal and Offshore Ornithology QIs* has been revised to incorporate updated desk-based data sources, additional site characterisation DAS, site-specific seabird flight height surveys and monitoring of the kittiwake breeding colony at Wicklow Head.

In relation to RFI (7q):

- The Applicant confirms that this document has taken into account the revisions and comments made to the Coastal Processes assessment, together with any associated updates to the Benthic Ecology, Fish and Shellfish, Marine Mammals and Offshore Ornithology assessments, all of which have been incorporated into this Natura Impact Statement, as follows:

- Section 6.2.1 *Overview and Supporting Information for the Assessment* has been revised to clearly direct the reader to the full numerical modelling reports appended to this NIS, setting out what each report contains. The section also guides the reader to EIAR Volume II, Chapter 6: Coastal Processes (Revised March 2026), which presents and interprets the modelling outputs in the context of impact pathways arising from physical processes, including those queries raised through RFI (7a–o).
- Section 6.2 now provides a robust summary of the updated sediment plume and morphodynamic modelling used to inform the assessment of impacts, particularly on Annex I Coastal and Marine Habitats (see paragraph 6.2.1.7 for references to and descriptions of the relevant documents). Figures have been selected to illustrate the modelling outputs representing the largest predicted magnitudes and spatial extents of sediment plumes and associated deposition relative to the SACs considered for Annex I Coastal and Marine Habitats.

In relation to RFI (8k):

- The Applicant confirms that, in addition to the consideration provided in the EIAR, this document has been reviewed and updated to provide further clarification on potential impacts on Annex I Coastal and Marine Habitats at Wicklow Reef SAC, Blackwater Bank SAC, Magherabeg Dunes SAC and Buckroney–Brittas Dunes SAC, specifically in relation to their Conservation Objectives. These updates are reflected as follows:
  - Table 5.1 lists the sites that have been screened in and shows the addition of a new impact pathway considering changes to physical processes from the presence of infrastructure during operation and potential effects on Annex I Coastal and Marine Habitats.
  - Section 6.2 *Assessment of the Proposed Development Alone for Coastal and Marine Habitat* has been updated to include additional information gathered since the original submission, including a site-specific benthic survey and the results of updated numerical sediment plume and morphodynamic modelling. These updates have further informed the assessment of relevant impact pathways on Annex I Coastal and Marine Habitats.

In relation to RFI (9c and 9d):

- The Applicant confirms that this document has been updated to incorporate additional site-specific surveys completed since the submission of the Application, and that resulting data have been incorporated into the updated baseline description and impact assessments, as appropriate, with relevance to marine mammals:
  - Section 6.3.2 *Annex II Marine Mammal Species Baseline Environment* now includes results from additional DAS, undertaken using an expanded 10 km buffer around the Array Area;
  - Section 6.3.2 *Annex II Marine Mammal Species Baseline Environment* also provides details and results from targeted monthly Seal VP surveys, in order to address limitations in aerial survey coverage of seal haul-out sites; and
  - Section 6.3.2 *Annex II Marine Mammal Species Baseline Environment* also integrates additional literature sources (e.g. Gilles *et al.*, 2025) to further support and contextualise the marine mammal baseline environment and subsequent assessments.

In relation to RFI (9q):

- The Applicant confirms that this document has been updated to address the request for a more detailed examination of the impacts from the Proposed Development for harbour porpoise within

European sites. The following European sites that are screened into the NIS are as follows: Lambay Island SAC, Carnsore Point SAC, Kenmare River SAC, and Belgica Mound SAC. These updates are reflected as follows:

- Section 6.4.6 provides an updated assessment of the harbour porpoise QI within Lambay Island SAC;
- Section 6.4.5 provides an updated assessment of the harbour porpoise QI within the Carnsore Point SAC;
- Section 6.4.10 provides an updated assessment of the harbour porpoise QI within Kenmare River SAC; and
- Section 6.4.12 provides an updated assessment of the harbour porpoise QI within the Belgica Mound SAC.

In relation to RFI (10k):

- The Applicant confirms that appropriate consideration has been given to the potential impacts on the QIs of designated sites that may be affected by changes to fish and shellfish ecology. This includes consideration of indirect effects on marine mammals and ornithological features that rely on fish and shellfish as key prey resources. Focusing on QIs within the relevant ZoIs, the assessment of changes in prey availability (i.e. changes in fish and shellfish ecology) has been undertaken comprehensively, drawing on the evidence and conclusions presented in the updated EIAR, to ensure that potential impacts on Natura 2000 sites designated for prey-dependent QIs can be confidently discounted. The relevant updates are set out as follows:
  - Section 6.4 *Assessment of Proposed Development alone for Annex II Marine Mammal* presents an updated assessment of changes in prey availability arising from the Proposed Development alone, with in-combination effects considered (where applicable) in Section 7.4.2.
  - Section 6.7.4 *Impacts and Parameters Assessed* presents consideration of indirect displacement due to effects on seabird prey species.

In relation to RFI (12p):

- The Applicant notes that EIAR Chapter 12: Offshore Ornithology has given consideration to the potential for ABWP1 to contribute to collision risk for kittiwake (a key species for this potential effect) and that very few collisions were attributed to these 7 turbines (<11 per year in total), but it was also noted that the owner and operator of the ABWP1, Arklow Energy Limited, has commenced pre-application consultation (Case Reference OC27.321635) with ACP and the appropriate local authorities to decommission ABWP1, which has reached the end of its operating life. Based on the fact that the ABWP1 team has commenced the pre-application process for decommissioning we expect ABWP1 to be fully decommissioned before commencement of operation of ABWP2. Therefore, given the very small number of estimates collisions at ABWP1 and the high probability of imminent decommissioning, no further consideration is considered necessary in the NIS.

In addition to the amendments made in response to RFI regarding various environmental receptor topics, this document has been updated to reflect the following design changes to the Proposed Development in response to RFI, as follows:

In relation to RFI 1b and 1c:

- Survey reports comprising an additional geophysical survey dataset conducted in 2024 has furthered understanding of bedrock elevation and has allowed the Applicant to reduce the maximum hammer piling energy required from 6,600kJ to 3,500kJ and associated adjustment of piling scenarios.

In relation to RFI 1b and 12o:

- Additional data received from recent supply chain engagement has enabled the Applicant to refine the blade chord width for both Project Design Options reducing the effects of the Proposed Development on birds.

In relation to RFI 2:

- In response to a submission received from the Department of Transport, in which the Irish Coast Guard (IRCG) made observations on the site layout, and as subsequently noted by ACP in their RFI in respect of search and rescue access, consideration has also been given to the Maritime Navigation Safety and Emergency Response Guidance Documents for Offshore Renewable Energy Installations (OREI), published in June 2025.
- This resulted in adjustments to the layout to ensure search and rescue access to the satisfaction of the IRCG as follows:
  - Reduction in the number of WTGs from 56 to 53 for Project Design Option 1;
  - Adjustments to the specific location of OSPs and WTGs for both Project Design Options to optimise the search and rescue access and coverage;
  - Associated requisite adjustments across both Project Design Options to the infrastructure and associated aspects of the Proposed Development which are a function of the location of the OSPs and WTGs such as the location of cables and the location of excavation and/or disposal required for construction activities.
- In order to maintain project delivery timelines, the commissioning and completions period has been optimised, therefore reducing the overall outline construction programme to 4 years.

Where relevant, these updates have been reflected in the corresponding assessment sections throughout this document, as follows:

- Table 6.3 lists the relevant impacts and updated design parameters used to inform the Annex I Coastal and Marine Habitats assessments;
- Table 6.8 lists the relevant impacts and updated design parameters used to inform the Annex II Marine Mammal assessments
- Table 6.~~23~~37 lists the relevant impacts and updated design parameters used to inform the Annex II Migratory Species assessments; and
- Table 6.~~29~~43 lists the relevant impacts and updated design parameters used to inform the Intertidal and Offshore Ornithology assessment.

Aside from the updates made in response to the RFI listed above, further consistency checks have been undertaken throughout the document, and minor amendments made where necessary to ensure the conclusions remain aligned with the evidence presented and with the updated NIS Volume I: Supporting Information to Inform Screening for Appropriate Assessment (Revised March 2026). Of note, this review has not resulted in any changes to the overall conclusions regarding AEoI for any European sites.

1 Executive Summary

1.1.1.1 Sure Partners Limited (hereafter referred to as “the Developer”) intends to build a new offshore windfarm, Arklow Bank Wind Park 2 (ABWP2) (the Project), situated on and around Arklow Bank in the Irish Sea, approximately 6 to 15 km to the east of Arklow in County Wicklow.

1.1.1.2 ABWP2 is made up of both onshore and offshore components. The subject of this Natura Impact Statement (NIS) is the offshore infrastructure only (the Proposed Development).

1.1.1.3 Article 6(3) of the Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (as amended) (the Habitats Directive) requires that the relevant competent authority (in this case An Bord Pleanála (ABP)) must undertake an Appropriate Assessment (AA) of the implications of a proposed plan or project, on its own or in combination with other plans or projects, on one or more than one European Site, in view of the Conservation Objectives of the site or sites. There are three stages to the Habitats Directive Assessment process. This report provides information to support the Stage ~~Two~~2 AA.

1.1.1.4 A Stage ~~One~~1 Supporting Information for Screening for ~~AA~~Appropriate Assessment (SISAA) Report was completed for the Proposed Development to determine whether the Proposed Development alone or in-combination with other plans and project would result in Likely Significant Effects (LSEs) on European sites in view of the sites’ Conservation Objectives~~.~~ (COs) (see NIS Volume I: Supporting Information for Screening for Appropriate Assessment (Revised March 2026)).

1.1.1.5 This NIS Volume II: Stage 2 Appraisal to Inform an Appropriate Assessment of Implications on European Sites (Revised March 2026) builds upon the conclusions of ~~the SISAA~~NIS Volume I: Supporting Information for Screening for Appropriate Assessment (Revised March 2026), with further information presented to better understand the risks presented by LSEs identified at Screening. It constitutes a Stage ~~Two~~2 Appropriate Assessment by presenting a study of the potential implications of the Proposed Development alone or in-combination with other plans and projects to adversely affect the integrity of ~~56~~57 European sites in view of the ~~Conservation Objectives~~COs of these sites.

1.1.1.6 These sites are designated to protect qualifying features from four receptor groupings relevant for this Proposed Development: Annex I coastal and marine habitats, Annex II marine species: including marine mammals~~,~~ and migratory fish species, and intertidal and offshore ornithology.

1.1.1.7 ~~1.1.1.5~~ An analysis of LSEs identified at Stage ~~One~~1 was undertaken for the ~~56~~57 European sites advanced to Stage ~~Two~~2 (AA). This includes ‘transboundary’ sites in the UK and France. Consideration was given to the potential for the Proposed Development alone and in-combination with other plans and projects to result in an Adverse Effect on ~~the~~ Integrity (AEoI) of the sites against the respective sites’ ~~conservation objectives~~CO.

1.1.1.8 ~~1.1.1.6~~ After detailed consideration of the potential for ~~Adverse Effects on Integrity (~~AEoI~~)~~ and in light of embedded commitments (avoidance of effects by ~~design~~standard project environmental protection measures~~)~~ and procedural controls based on industry best practice), and additional mitigation measures which are included as part of the Proposed Development and factored into the assessment, a conclusion was determined that no AEoI will result from the Proposed Development alone or in-combination with other plans and projects for all sites.

2 Introduction

2.1 Overview

2.1.1.1 Having regard to Part XAB of the Planning and Development Act 2000 (as amended), this report presents information to support the competent authority ABP, to undertake an AA. The report aims to inform and assist the competent authority in carrying out the AA for European sites. This NIS has been prepared, taking into account the ~~Conservation Objectives (~~COs~~)~~ of the European sites (Special Areas of Conservation (SACs), Special Protected Areas (SPAs), Candidate SACs (cSACs) and SPAs (cSPAs) and their ~~qualifying interests (QI)s~~QIs that were identified within ~~the~~NIS Volume I: Supporting Information for Screening for ~~AA Report (SISAA~~Appropriate Assessment (Revised March 2026). It should be noted that ~~although~~while cSACs and cSPAs were ~~considered, none were identified for the inclusion within this~~fully assessed in this NIS, the screening concluded that there would be no LSE on identified candidate sites (see NIS Volume I: Supporting Information for Screening for Appropriate Assessment (Revised March 2026).

2.1.1.2 This Stage 2 NIS (NIS Volume II: Stage 2 Appraisal to Inform an Appropriate Assessment of Implications on European Sites (Revised March 2026)) is to assist the competent authority in undertaking its AA for the Proposed Development. There are two Project Design Options this NIS considers through the process.

2.1.2 Statement of Authority

Table 2.1: List of authors and relevant experience

Author	Qualification and experience of authors
Jennifer Gibson Original Submission Author	Jennifer Gibson is a Senior HRA Consultant at GoBe Consultants with 5 years' environmental consultancy experience. She gained a Masters in Ecological Management and Conservation Biology from Queens University Belfast. Jennifer had been lead author on a large number of Irish NISs for OWF construction and associated surveys.
Charles Stamp Original Submission Author	Charles Stamp is a Senior HRA Consultant at GoBe Consultants with six years of ecological consultancy experience. Charles worked at Natural England for three years where he worked on and managed interaction with a variety of projects including NSIPs, residential housing developments, scientific research and the use of strategic approaches to carrying out Habitat Regulation Assessments. He has a BSc in Zoology from Bangor University, Wales.
Glen Gillespie Original Submission Lead	Glen is an Associate Director and Head of HRA at GoBe Consultants. Glen was at Natural England for a total of thirteen years where he worked across a range of projects which included windfarms, residential housing developments, nuclear new builds, grid infrastructure and tidal lagoons. Following his departure from Natural England in 2016, Glen has worked in environmental consultancy at Senior, Principal and Associate Director levels, across a range of terrestrial and marine projects - including more than ten offshore windfarm projects across the UK and Ireland.
Emily Muir Post-Submission Updates Author	Emily is a Marine Water and Sediment Quality (MW&SQ) and HRA specialist with two years of professional experience in marine environmental consultancy. She has contributed to a wide range of projects, including HRAs, Natura Impact Statements, EIAs, MULAs, WFD Compliance Assessments, and Dumping at Sea Permit Applications, primarily in the offshore renewable energy sector, with an expanding portfolio across marine and coastal developments. Emily holds a Certificate in Marine Pollution Prevention and Management from Lloyd's Maritime Academy and has detailed knowledge of international marine pollution

Author	Qualification and experience of authors
	conventions and EU/Irish environmental legislation, particularly the Habitats and Birds Directives. She earned a First-Class Honours BSc in Applied Bioscience and Zoology with distinction from the University of the West of Scotland and focused her post-graduate research on ecotoxicological assessments of microplastics in lentic ecosystems across Scotland.
Lauren Kirkland Post-Submission Updates Reviewer	Associate Director with a doctorate in shellfish ecology and commercial fisheries. She has 14 years' experience in the offshore wind sector and during this time, she has served as project manager and project director for offshore wind projects throughout the UK and Ireland, managing environmental and consents requirements. Experience managing the pre-application, examination and post-application phases of both the offshore and onshore elements of large offshore wind farm projects.

2.1.2.1 Please refer to the topic specific chapters of the EIAR for additional Statements of Authority, as follows:

- Chris Nikitik, Post-Submission Updates Benthic Ecology Technical Lead (see EIAR Volume II, Chapter 9: Benthic Subtidal and Intertidal Ecology (Revised March 2026));
- Edward Rickard, Post-Submission Updates Migratory Fish Technical Lead (see EIAR Volume II, Chapter 10: Fish, Shellfish and Sea Turtle Ecology (Revised March 2026));
- Ophelie Humphrey-Walsh, Post-Submission Updates Marine Mammal Technical Lead (see EIAR Volume II, Chapter 11: Marine Mammals (Revised March 2026)); and
- Mark Trinder, Post-Submission Updates Ornithology Technical Lead (see EIAR Volume II, Chapter 12: Offshore Ornithology (Revised March 2026)).

2.2 Legislative and the AA procedure

2.2.1 The Habitats Directive

2.2.1.1 Article 6(3) of the Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (as amended) (the Habitats Directive) requires that–

> *"Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon either individually or in combination with other plans or projects, shall be subject to AA of its implications for the site in view of the site's conservation objectives. In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and if appropriate, after having obtained the opinion of the general public."*

2.2.1.2 Thus, Article 6(3) provides a two-stage process:

- The first stage involves a screening for AA; and
- The second stage therefore only arises where the conclusion of the screening is that an AA is required. Where it is concluded that an AA is not required, Stage 2 is not applicable.

2.2.1.3 Article 6(4) introduces a third stage should the conclusion of Stage 2 be negative but the need of the project warrants further consideration and derogation which would allow the project to be approved in limited circumstances where the Stage 2 AA has concluded that it would or may have AEoI on European sites, with Article 6(4) allowing for derogations from Article 6(3).

2.2.1.4 This report is concerned with the second stage of the AA procedure.

2.2.2 Irish Legislation

2.2.2.1 For the purposes of applications for planning permission, Part XAB of the Planning and Development Act 2000, as amended ("the PDA") transposes the obligations under Article 6(3) into Irish law and sets out the duties of the relevant Competent Authority. In relation to other consent regimes, the provisions of the European Communities (Birds and Natural Habitats) Regulations 2011, as amended ("the 2011 Regulations"), transpose those obligations.

2.2.2.2 The Planning and Development Act 2024 has been enacted; however, as of March 2026, Chapter 3 of Part 6 (which is intended to replace Part XAB in respect of Appropriate Assessment) has not yet been commenced. Accordingly, Part XAB of the Planning and Development Act 2000, as amended, remains in force.

2.3 Appropriate Assessment

2.3.1.1 Section 177V of the PDA determines than an AA shall include a determination by the competent authority under Article 6.3 of the Habitats Directive as to whether or not a draft land use plan or proposed development would adversely affect the integrity of a European site. Section 177V (2) states:

"In carrying out an appropriate assessment under subsection (1) the competent authority shall take into account each of the following matters:

(a) the Natura impact report or Natura impact statement, as appropriate;

(b) any supplemental information furnished in relation to any such report or statement;

(c) if appropriate, any additional information sought by the authority and furnished by the applicant in relation to a Natura impact statement;

(d) any additional information furnished to the competent authority at its request in relation to a Natura impact report;

(e) any information or advice obtained by the competent authority;

(f) if appropriate, any written submissions or observations made to the competent authority in relation to the application for consent for proposed development;

(g) any other relevant information."

2.3.1.2 Section 177V (4) states:

"Subject to the other provisions of this Act, consent for proposed development may be given in relation to a proposed development where a competent authority has made modifications or attached conditions to the consent where the authority is satisfied to do so having determined that the proposed development would not adversely affect the integrity of the European site if it is carried out in accordance with the consent and the modifications or conditions attaching thereto."

2.4 Procedure

2.4.1.1 According to European Commission (EC) guidance documents 'Assessment of plans and projects significantly affecting Natura 2000 sites' (EC, 2001); 'Managing Natura 2000 sites: The Provisions of Article 6 of the 'Habitats' Directive 92/43/EEC' (EC, 2019); and the EC 'Guidance document on

wind energy developments and EU nature legislation' (EC, 2020), the obligations arising under Article 6 establish a step-wise procedure for AA as follows, and as illustrated in Figure 2.1.

2.4.1.2 The first part of this procedure consists of a pre-assessment (or screening) stage to determine whether, firstly, a project is directly connected with or necessary to the management of the site, and secondly, whether it is likely to have a significant effect on the site. This part is governed by the first sentence of Article 6(3).

2.4.1.3 The second part of the procedure, governed by the second sentence of Article 6(3), relates to the AA and the decision of the competent authority as to whether the plan or project, alone or in combination with other projects or plans, will have Adverse Effects on Integrity (AEoI) of a European site.

2.4.1.4 A third part of the procedure (governed by Article 6(4)) comes into play if, despite a negative assessment it is proposed not to reject a project but to give it further consideration. In this case Article 6(4) allows for derogations from Article 6(3) under certain conditions.

2.4.1.5 The extent to which the sequential steps of Article 6(3) apply to a project depends on several factors, and in the sequence of steps, each step is influenced by the previous step. The order in which the steps are followed is therefore essential for the correct application of Article 6(3).

2.4.1.6 Each step determines whether a further step in the process is required. If, for example, the conclusion at the end of a Stage 1 screening appraisal is that significant effects on European sites can be excluded in the absence of any mitigation measures intended to avoid or reduce the harmful effects of the project on European sites (i.e. factored-in measures and further mitigation), there is no requirement to proceed to the next step.

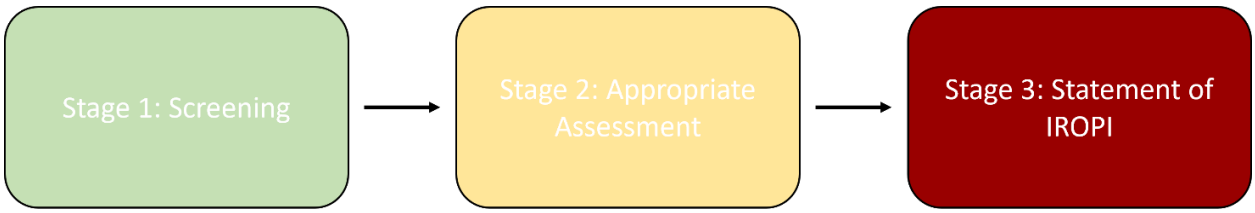


Figure 2.1 Stages of the AA process (Source: DEHLG, 2009)

2.5 Document Structure

2.5.1.1 This report is structured as follows:

- Section ~~**Error! Unknown switch argument.**~~1: Executive Summary;
- Section 2: Introduction – This section sets out the background of the Proposed Development along with the relevant legislation, guidance and approach that has been followed within this document;
- Section 3: Methodology – This section sets out the methodology followed, and guidance documents adhered to in conducting a Stage 2 Appraisal of the implications of the Proposed Development, alone or in-combination with any other plans or projects on European sites;
- Section 4: The Proposed Development – This section describes the Proposed Development, and is the basis of the Stage 2 Appraisal at Section 6 and 7;
- Section 5: Conclusion of Stage 1 SISAA – This section sets out the findings of the Stage 1 SISAA;
- Section 6 and 7: Stage 2 Appraisal for the Proposed Development Alone and In-combination with other Plans/Projects – These sections contain a more detailed examination and analysis of the implications of the Proposed Development on the COs of the European Sites identified in ~~the SISAA~~NIS Volume I: Supporting Information for Screening for Appropriate Assessment (Revised March 2026) and taken forward for a Stage 2 Appraisal. The Stage 2 appraisal has been

undertaken in view of best scientific knowledge, in light of the COs of the sites concerned and considers the Proposed Development individually and in combination with other plans and projects;

- Section 8: Conclusion of Stage 2 Appraisal – This section sets out the findings of the Stage 2 AA.

3 Methodology

3.1 Guidance

3.1.1.1 AA Guidelines for Competent Authorities have been published by the Department of the Environment, Heritage and Local Government (DEHLG) (DEHLG, 2010a). In addition to the advice available from the DEHLG, the European Commission has published a number of documents which provide a significant body of guidance on the requirements of AA, most notably including 'Assessment of Plans and Projects Significantly Affecting Natura 2000 sites - Methodological Guidance on the Provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC' (EC, 2001), which sets out the principles of how to approach decision making during the process.

3.1.1.2 The principal national and European guidelines have been followed in the preparation of this report. The following list identifies these and other pertinent guidance that has been adhered to:

- Office of the Planning Regulator (OPR) Practice Note: Appropriate Assessment Screening for Development Management (OPR, 2021);
- Communication from the Commission on the Precautionary Principle, Office for Official Publications of the European Communities, Luxembourg (EC, 2000);
- Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Articles 6(3) and (4) of the Habitats Directive 92/43/EEC. Office for Official Publications of the European Communities, Brussels (EC, 2021);
- Estuaries and Coastal Zones within the Context of the Birds and Habitats Directives - Technical Supporting Document on their Dual Roles as Natura 2000 Sites and as Waterways and Locations for Ports. European Commission (EC, 2009);
- Appropriate Assessment of Plans and Projects in Ireland. Guidance for Planning Authorities. Department of the Environment, Heritage and Local Government, Dublin (DEHLG, 2010a);
- Department of Environment Heritage and Local Government Circular NPW 1/10 and PSSP 2/10 on Appropriate Assessment under Article 6 of the Habitats Directive - Guidance for Planning Authorities (DEHLG, 2010b);
- Guidance document on the implementation of the birds and habitats directive in estuaries and coastal zones with particular attention to port development and dredging. European Commission (EC, 2012);
- Guidance document: Wind Energy Developments and Natura 2000. European Commission (EC, 2010);
- Marine Natura Impact Statements in Irish Special Areas of Conservation: A working document, National Parks and Wildlife Service, Dublin (NPWS, 2012);
- Interpretation Manual of European Union Habitats. Version EUR 28. European Commission (EC, 2013a);
- Guidelines on Climate Change and Natura 2000. European Commission (EC, 2013b);
- Guidance on EIS and NIS Preparation for Offshore Renewable Energy Projects. Department of Communications, Climate Action and Environment (DCCAE, 2017);
- European Commission Notice C (2018) 7621 'Managing Natura 2000 Sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC', Office for Official Publications of the European Communities, Luxembourg (EC, 2019);
- Institute of Air Quality Management 'A guide to the assessment of air quality impacts on designated nature conservation sites (Version 1.1)' (IAQM, 2020); and
- European Commission Notice C (2020) 7730 'Guidance document on wind energy developments and EU nature legislation', Office for Official Publications of the European Communities, Luxembourg (EC, 2020).

3.2 Adverse Effects on Integrity of European Sites (AEoI)

3.2.1.1 The European Commission's 2018 Notice (EC, 2019) advises that the purpose of the AA is to assess the implications of the plan or project in respect of the European site's COs, either individually or in combination with other plans or projects. The conclusions should enable the competent authorities to ascertain whether the plan or project will adversely affect the integrity of the site concerned. The focus of the AA is therefore specifically on the species and/or the habitats for which the European site is designated.

3.2.1.2 EC (2019) also emphasises the importance of using the best scientific knowledge when carrying out the AA in order to enable the competent authorities to conclude with certainty that there will be no AEoI of the site. This guidance notes that it is at the time of adoption of the decision authorising implementation of the project that there must be no reasonable scientific doubt remaining as to the absence of AEoI of the site in question.

3.2.1.3 The judgement of the Court of Justice of the European Union (CJEU) confirmed in its ruling in Case C-258/11 that 'Article 6(3) of the Habitats Directive must be interpreted as meaning that a plan or project not directly connected with or necessary to the management of a site will adversely affect the integrity of that site if it is liable to prevent the lasting preservation of the constitutive characteristics of the site that are connected to the presence of a priority natural habitat whose conservation was the objective justifying the designation of the site in the list of Sites of Community Importance (SCIs), in accordance with the directive. The precautionary principle should be applied for the purposes of that appraisal'. EC (2019) advises that the logic of such an interpretation would also be relevant to non-priority habitat types and to habitats of species.

3.2.1.4 ‘As regards the meaning of 'integrity', this clearly relates to ecological integrity. This can be considered as a quality or condition of being whole or complete. In a dynamic ecological context, it can also be considered as having the sense of resilience and ability to evolve in ways that are favourable to conservation’.

3.2.1.5 ‘The 'integrity of the site' can be usefully defined as the coherent sum of the site's ecological structure, function and ecological processes, across its whole area, which enables it to sustain the habitats, complex of habitats and/or populations of species for which the site is designated’ (EC, 2019).

3.2.1.6 EC (2019) notes that ‘if the competent authority considers the mitigation measures are sufficient to avoid the AEoI identified in the AA, they will become an integral part of the specification of the final plan or project or may be listed as a condition for project approval’.

3.2.1.7 EC (2020) advises that ‘it is for the competent authorities, in the light of the conclusions made in the AA on the implications of a plan or project for the European site concerned, to approve the plan or project. This decision can only be taken after they have made certain that the plan or project will not adversely affect the integrity of the site. That is the case where no reasonable scientific doubt remains as to the absence of such effects’.

3.2.1.8 EC (2020) also reaffirms that ‘the authorisation criterion laid down in the second sentence of Article 6(3) of the Habitats Directive integrates the precautionary principle and makes it possible effectively to prevent the protected sites from suffering AEoI as the result of the plans or projects. A less stringent authorisation criterion could not as effectively ensure the fulfilment of the objective of site protection intended under that provision. The onus is therefore on demonstrating the absence of AEoI rather than their presence, reflecting the precautionary principle. It follows that the AA must be sufficiently detailed and reasoned to demonstrate the absence of AEoI, in light of the best scientific knowledge in the field’.

3.3 Consideration of Ex-situ Effects

3.3.1.1 EC (2019) advises that 'Member States, both in their legislation and in their practice, allow for the Article 6(3) safeguards to be applied to any development pressures, including those which are external to European sites, but which are likely to have significant effects on any of them'.

3.3.1.2 The CJEU developed this point when it issued a ruling in case C-461/17 ("Brian Holohan and Others v An Bord Pleanála") that determined inter alia that Article 6(3) of Directive 92/43/EEC must be interpreted as meaning that an AA must on the one hand, catalogue the entirety of habitat types and species for which a site is protected, and, on the other, identify and examine both the implications of the proposed project for the species present on that site, and for which that site has not been listed, and the implications for habitat types and species to be found outside the boundaries of that site, provided that those implications are liable to affect the COs of the site.

3.3.1.3 In that regard, consideration has been given in this Stage 2 appraisal to inform AA.

3.4 Conservation Objectives (COs)

3.4.1.1 The COs for each European site are to maintain or restore the favourable conservation condition of the habitats and/or species for which the European site has been selected.

3.4.1.2 The favourable conservation status of a habitat is achieved when:

- its natural range, and area it covers within that range, are stable or increasing;
- the specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future; and
- the conservation status of its typical species is favourable.

3.4.1.3 The favourable conservation status (FCS) (or condition, at a site level) of a species is achieved when:

- population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats;
- the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future; and
- there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

3.4.1.4 The most up-to-date site-specific COs for the European sites being considered have been used in this appraisal. Details in relation to the QIs of SACs and SPAs is based on publicly available data sourced from the relevant Statutory Nature Conservation Bodies (SNCBs) in Ireland and other relevant states in December 2023.

3.4.1.5 In response to RFI (1b), whilst the data sourced in December 2023 remains relevant and appropriate, these COs have been reviewed against the most recent information available as of January 2026. The assessments have been carried out using all recent site-specific conservation objectives where these are available.

3.5 In-Combination Effects

3.5.1.1 Article 6(3) of the Habitats Directive requires that in-combination effects with other plans or projects are also considered. As set out in the Commission's 2018 Notice (EC, 2019), significance will vary depending on factors such as magnitude of impact, type, extent, duration, intensity, timing, probability, in-combination effects and the vulnerability of the habitats and species concerned.

3.5.1.2 In that context, all elements of the Proposed Development are considered in combination. This includes the other components of the ABWP2 Project:

- ABWP2 Onshore Grid Infrastructure (OGI);
- ABWP2 Operations and Maintenance Facility (OMF); and
- EirGrid Upgrade Works.

3.5.1.3 The owner and operator of the ABWP1, Arklow Energy Limited has commenced pre-application consultation (Case Reference OC27.321635) with the appropriate local authorities to decommission ABWP1, which has reached the end of its operating life.

3.5.1.4 The ABWP1 team has begun engaging with the Maritime Area Regulatory Authority (MARA) and is working closely with An Coimisiún Pleanála to agree on the details of the decommissioning and removal works. Based on the fact that the ABWP1 team has commenced the pre-application process for decommissioning we expect ABWP1 to be fully decommissioned before commencement of operation of ABWP2.

3.5.1.5 ~~3.5.1.3~~ In addition, other plans or projects which are completed, approved but uncompleted, or proposed are considered. EC (2019) specifically advises that "as regards other proposed plans or projects (i.e. other projects not proposed by the Applicant), on grounds of legal certainty it would seem appropriate to restrict the in-combination provision to those which have been actually proposed, i.e. for which an application for approval or consent has been introduced". However, on a precautionary basis this has been amended for this NIS to include projects for which reasonable steps have been taken as to not limit the assessment to other projects where an application for approval or consent has been introduced.

3.5.1.6 ~~3.5.1.4~~ The Developer submitted a Foreshore Licence Application for Site Surveys (associated with the Proposed Development) to the Minister for Housing, Local Government and Heritage in April 2023 (FS007555) ~~and~~. This application ~~is pending determination~~was determined and granted on 04 July 2024 and is valid until 04 June 2029. The Developer confirms and commits that they will not conduct any activities the subject of the Foreshore Licence Application for Site Surveys ~~(should a licence be granted)~~ at the same time as any development is being carried out under this permission (if granted). As such, there is no temporal overlap between the activities proposed in the Foreshore Licence Application and the Proposed Development. For this reason, FS007555 is not considered within the in-combination assessment of this NIS.

3.5.1.7 ~~3.5.1.5~~ All of the projects to be considered in combination with the Proposed Development are described more comprehensively in Section 7 of the NIS.

3.5.1.8 ~~3.5.1.6~~ The ability for impacts arising from the Proposed Development to overlap with those from other projects, plans and activities to result in AEoI has been assessed on a receptor basis for each group of QIs. This means that, in most examples, with the impacts arising from the two (or more) projects, both (or multiple) projects must have some form of impact arising from project related activities on the same QI and CO at the same time for an in-combination effect to arise. For example, for an in-combination sedimentation effect to be established between the Proposed Development and another project, it must be established that the extent of sediment release from both projects has the potential to overlap and may affect a receptor at the same protected site. This also applies to mobile species and as an example there are certain mobile receptors that may move between, and be subject to, two or more separate physical extents of impact from two or more projects. Marine mammals and Birds are the primary species this applies to. With Marine Mammals they may be affected by noise impacts from the Proposed Development, as well as those from other projects where the extent of another defined works area does not directly overlap with that of the Proposed Development but that is within that species range. Furthermore, individual receptors from the same population may be exposed to separate impacts from different projects occurring at the same time while the population is separated, leading to an effect upon the population as a whole. Where relevant, these potential eventualities have been taken into

consideration in the in-combination assessment and mitigation proposed as necessary to prevent adverse in-combination effects occurring.

3.6 Assessment Approach

3.6.1.1 Two Project Design Options are being considered for the Proposed Development. It is therefore necessary that the NIS assesses both Project Design Options.

3.6.1.2 To assess both Project Design Options along with all permutations of the Proposed Development, the NIS assessment makes clear where parameters between the two Project Design Options are the same or one is representative of the other (and therefore the effect on COs for each European Site which has been scoped in, is the same). The NIS also makes clear where parameters between the two Project Design Options differ (and therefore where the effect on the COs for each European Site which has been scoped in may differ).

4 The Proposed Development

4.1 Location

4.1.1.1 The Proposed Development is a proposed offshore windfarm situated on and around Arklow Bank in the Irish Sea, approximately 6 km to 15 km to the east of Arklow in County Wicklow. Arklow Bank is a shallow offshore sandbank, measuring approximately 27 km by 2.5 km. On the bank, water depths vary between 0.6 m and 25 m relative to Lowest Astronomical Tide (LAT), with shallower areas particularly occurring in the vicinity of the existing seven wind turbines of Arklow Bank Wind Park 1 (ABWP1). The general morphology of this feature is oriented roughly in a north-south direction. There is a large variation in depth within the area, with water depths in excess of 50 m LAT beyond the bank towards the east. Arklow Bank is subject to very strong tidal currents with the general direction of flow in the offshore regions of the bank towards the north-north-east during flood and towards south-south-west during ebb. The Arklow Bank is sand and gravel dominated with mobile surface sediments. Medium sand is mainly located at upper levels. ABWP1 which is adjacent has a capacity of 25.2 MW and was constructed on Arklow Bank in 2003/04. It is owned and operated by Arklow Energy Limited (ABWP1) and remains the first and only operational offshore windfarm in Ireland.

4.1.1.2 The area in which the Wind Turbine Generators (WTGs), Offshore Substation Platforms (OSP(s)) and associated cables (export, inter- array and interconnector cabling) and foundations will be located is referred to as the Array Area. The Array Area covers an area of seabed 63.4 km^2. The area in which the export, inter-array and interconnector cabling will be ~~located will be~~ referred to as the Cable Corridor and Working Area, and will extend from the Array Area to a landfall approximately 4.5 km to the north of Arklow at Johnstown North. This area will also facilitate vessel jacking operations associated with installation of WTG structures and associated foundations within the Array Area.

4.1.1.3 Figures showing the site location and proposed site layouts can be found in Figure 4.1 and Figure 4.2.

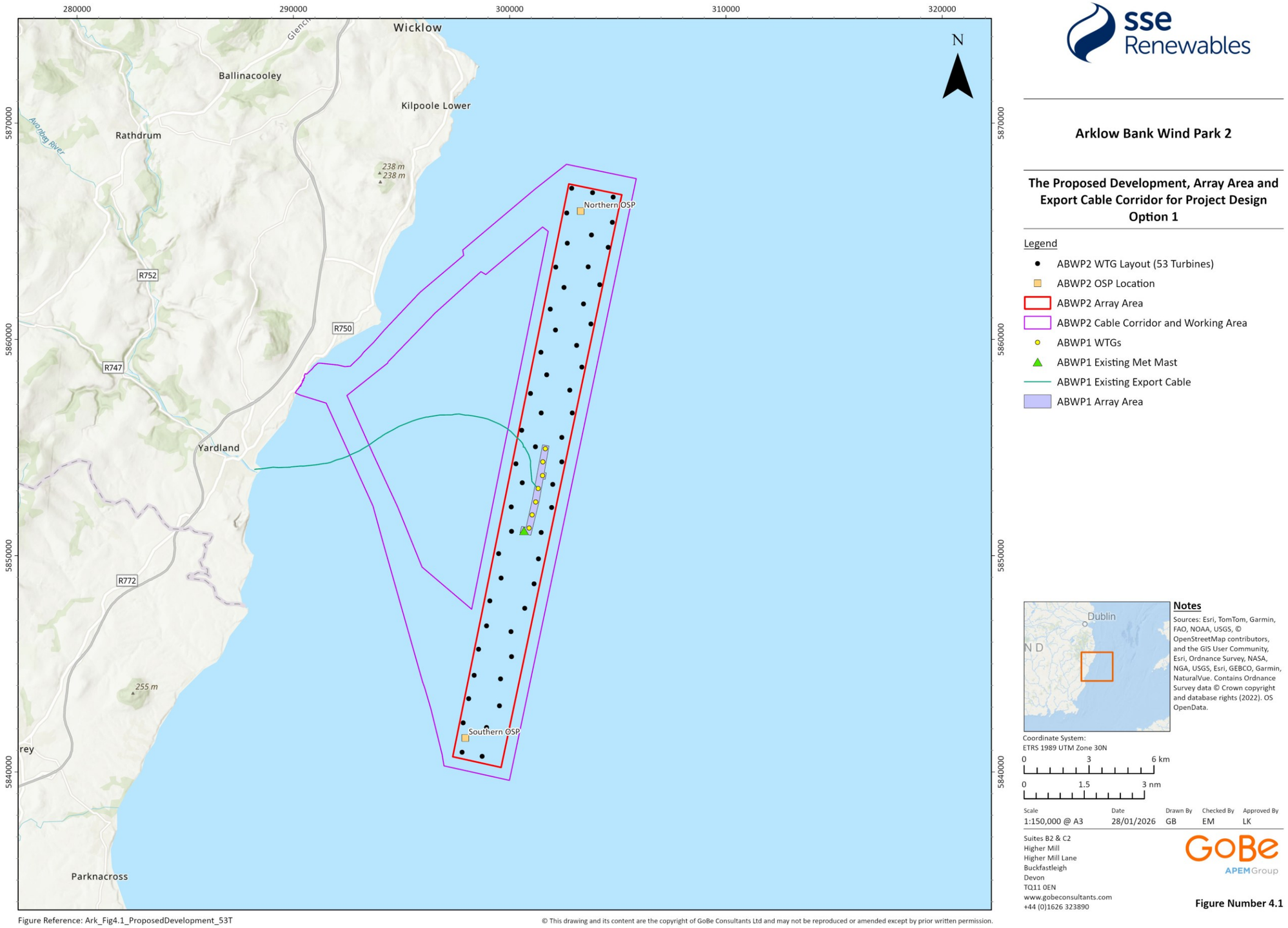


Figure 4.1: The Proposed Development Array Area and Export Cable Corridor for Project Design Option 1

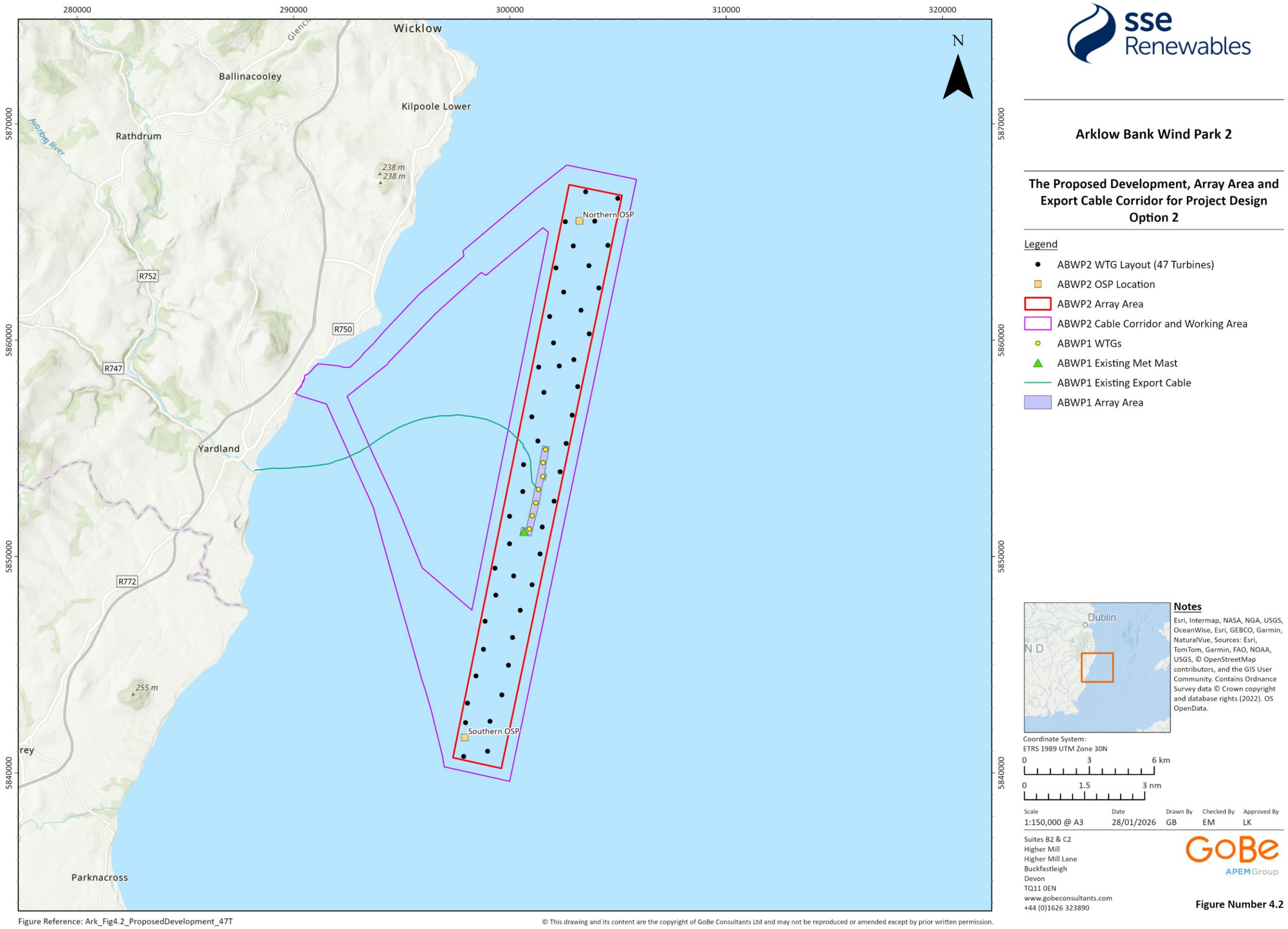


Figure 4.2: The Proposed Development Array Area and Export Cable Corridor for Project Design Option 2

4.2 Overview of the Proposed Development

4.2.1.1 The full description of the Proposed Development, including both design options, and associated cabling is contained within Section 4 of the NIS Volume I: Supporting Information for Screening ~~Report~~for Appropriate Assessment (Revised March 2026).

5 Conclusion of the Stage 1 Screening Assessment

5.1 Summary of Stage 1 Screening Assessment for SACs

5.1.1.1 From the findings of the screening stage appraisal presented (NIS Volume I~~,~~: Supporting Information for Screening for Appropriate Assessment Report (Revised March 2026)), the possibility of ~~Likely Significant Effects~~LSE could not be excluded for the following SACs and QIs at the screening stage (Table 5.1), in the absence of further evaluation and analysis and/or mitigation measures. The result of the screening applies to both Project Design Options and all other permutations ~~described~~summarised in Section 4~~.~~ of this document and described in detail in Section 4 of NIS Volume I: Supporting Information for Screening for Appropriate Assessment (Revised March 2026).

5.1.1.2 It is noted that some SACs in Table 5.1 support additional QIs that are not listed in the table. These have not been listed where they fall outside the screening range of the Proposed Development and therefore based on the outcomes of the NIS Volume I: Supporting Information for Screening for Appropriate Assessment (Revised March 2026) were not screened in for further assessment within this NIS (NIS Volume II: Stage 2 Appraisal to Inform an Appropriate Assessment of Implications on European Sites (Revised March 2026)).

~~5.1.1.1~~

Table 5.1: SACs and their Qualifying ~~Interest~~Interests (QIs) considered in this NIS where Likely Significant Effect (LSE) could not be excluded at the screening stage

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QI)s~~QIs)	Potential Impacts Screened In
Wicklow Reef SAC	3.61	To maintain the favourable conservation condition of reefs in Wicklow Reef SAC, which defined by the following list of attributes and targets: • **Habitat area** – permanent habitat area in stable or increasing, subject to natural processes; • **Distribution** – the distribution of reefs in stable or increasing, subject to natural processes; and • **Community structure** – conserve the following community type in a natural condition: Current-swept subtidal reef community complex.	~~(~~NPWS~~,~~ (2013a)	Reefs [1170]	Elevated levels of ~~suspended sediment concentrations~~SSCs and associated ~~sediment~~ deposition, Accidental pollution, Changes to tidal currents, sediment transport processes, and seabed morphology resulting from the presence of infrastructure (hereafter referred to as "Changes to physical processes").
Magherabeg Dunes SAC	~~3.66~~3.44	To maintain the favourable conservation condition of Annual vegetation of drift lines in Magherabeg Dunes SAC, which is defined by the following list of attributes and targets: • **Habitat area** - Area stable or increasing, subject to natural processes, including erosion and succession; • **Habitat distribution** - No decline or change in habitat distribution, subject to natural processes; • **Physical structure: functionality and sediment supply** - Maintain the natural circulation of sediment and organic matter, without any physical obstructions; • **Vegetation structure: zonation** - Maintain the range of coastal habitats including transitional	~~(~~NPWS~~,~~ (2017a)	Annual vegetation of drift lines [1210]	Elevated levels of ~~suspended sediment concentrations~~SSCs and associated ~~sediment~~ deposition, Accidental pollution, Changes to physical processes

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
		zones, subject to natural processes including erosion and succession; • **Vegetation composition: typical species and sub-communities -** Maintain the presence of species-poor communities with typical species: sea rocket (*Cakile maritima*), sea sandwort (*Honckenya peploides*), prickly saltwort (*Salsola kali*) and oraches (*Atriplex* spp.); and • **Vegetation composition: negative indicator species -** Negative indicator species (including non-native species) to represent less than 5% cover.			
		To maintain the favourable conservation condition of Embryonic shifting dunes in Magherabeg Dunes SAC, which is defined by the following list of attributes and targets: • **Habitat Area** - Area stable or increasing, subject to natural processes, including erosion and succession; • **Habitat distribution** - No decline or change in habitat distribution, subject to natural processes; • **Physical structure: functionality and sediment supply** - Maintain the natural circulation of sediment and organic matter, without any physical obstructions; • **Vegetation structure: zonation** - Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession; • **Vegetation composition: plant health of foredune grasses** - More than 95% of sand		Embryonic shifting dunes [2110]	Elevated levels of ~~suspended sediment concentrations~~SSCs and associated ~~sediment~~ deposition, Accidental pollution, Changes to physical processes

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
		couch grass (*Elytrigia juncea*) and/or lyme-grass (*Leymus arenarius*) should be healthy (i.e., green plant parts above ground and flowering heads present); • **Vegetation composition: typical species and sub-communities -** Maintain the presence of species-poor communities with typical species: sand couch grass (*Elytrigia juncea*) and/or lyme-grass (*Leymus arenarius*); and • **Vegetation composition: negative indicator species -** Negative indicator species (including non-native species) to represent less than 5% cover.			
		To maintain the favourable conservation condition of Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) in Magherabeg Dunes SAC, which is defined by the following list of attributes and targets: • **Habitat Area** - Area stable or increasing, subject to natural processes, including erosion and succession; • **Habitat distribution** - No decline or change in habitat distribution, subject to natural processes; • **Physical structure: functionality and sediment supply** - Maintain the natural circulation of sediment and organic matter, without any physical obstructions; • **Vegetation structure: zonation** - Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession;		Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120]	Elevated levels of ~~suspended sediment concentrations~~SSCs and associated ~~sediment~~ deposition, Accidental pollution, Changes to physical processes

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
		• **Vegetation composition: plant health of foredune grasses** - More than 95% of marram grass (*Ammophila arenaria*) and/or lyme-grass (*Leymus arenarius*) should be healthy (i.e., green plant parts above ground and flowering heads present); • **Vegetation composition: typical species and sub-communities -** Maintain the presence of species-poor communities dominated by marram grass (*Ammophila arenaria*) and/or lyme-grass (*Leymus arenarius*); and • **Vegetation composition: negative indicator species -** Negative indicator species (including non-native species) to represent less than 5% cover.			
		To restore the favourable conservation condition of Fixed coastal dunes with herbaceous vegetation (grey dunes) in Magherabeg Dunes SAC, which is defined by the following list of attributes and targets: • **Habitat Area** - Area stable or increasing, subject to natural processes, including erosion and succession; • **Habitat distribution** - No decline or change in habitat distribution, subject to natural processes; • **Physical structure: functionality and sediment supply** - Maintain the natural circulation of sediment and organic matter, without any physical obstructions; • **Vegetation structure: zonation** - Maintain the range of coastal habitats including transitional		Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]	Elevated levels of ~~suspended sediment concentrations~~SSCs and associated ~~sediment~~ deposition, Accidental pollution, Changes to physical processes

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
		zones, subject to natural processes including erosion and succession; • **Vegetation structure: Sward height** – maintain structural variation within sward; • **Vegetation composition: typical species and sub-communities** - Maintain the presence of typical species; • **Vegetation composition: negative indicator species -** Negative indicator species (including non-native species) to represent less than 5% cover; and • **Vegetation composition: scrub/ trees** – No more than 5% cover of under control.			
		To maintain the favourable conservation condition of Atlantic decalcified fixed dunes (*Calluno-Ulicetea*) in Magherabeg Dunes SAC, which is defined by the following list of attributes and targets: • **Habitat Area** - Area stable or increasing, subject to natural processes, including erosion and succession; • **Habitat distribution** - No decline or change in habitat distribution, subject to natural processes; • **Physical structure: functionality and sediment supply** - Maintain the natural circulation of sediment and organic matter, without any physical obstructions; • **Vegetation structure: zonation** - Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession;		Atlantic decalcified fixed dunes (*Calluno-Ulicetea*) [2150]	Elevated levels of ~~suspended sediment concentrations~~SSCs and associated ~~sediment~~ deposition, Accidental pollution, Changes to physical processes

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
		• **Vegetation structure**: bare ground – maintain structural variation within swards; • **Vegetation structure: Sward height** – maintain structural variation within sward; • **Vegetation composition: typical species and sub-communities** - Maintain the presence of typical species; • **Vegetation composition: negative indicator species -** Negative indicator species (including non-native species) to represent less than 5% cover; and • **Vegetation composition: scrub/ trees** – No more than 5% cover of under control.			
Buckroney-Brittas Dunes and Fen SAC	~~0.31~~0.05	To maintain the favourable conservation condition of Annual vegetation of drift lines in Buckroney-Brittas Dunes and Fen SAC, which is defined by the following list of attributes and targets: • **Habitat area** - Area stable or increasing, subject to natural processes, including erosion and succession; • **Habitat distribution** - No decline or change in habitat distribution, subject to natural processes; • **Physical structure: functionality and sediment supply** - Maintain the natural circulation of sediment and organic matter, without any physical obstructions; • **Vegetation structure: zonation** - Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession;	~~(~~NPWS~~,~~ (2017b)	Annual vegetation of drift lines [1210]	Elevated levels of ~~suspended sediment concentrations~~SSCs and associated ~~sediment~~ deposition, Accidental pollution, Changes to physical processes

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
		• **Vegetation composition: typical species and sub-communities** - Maintain the presence of species-poor communities with typical species: sea rocket (*Cakile maritima*), sea sandwort (*Honckenya peploides*), prickly saltwort (*Salsola kali*) and oraches (*Atriplex* spp.); and • **Vegetation composition: negative indicator species** - Negative indicator species (including non-native species) to represent less than 5% cover.			
		To restore the favourable conservation condition of Perennial vegetation of stony banks in Buckroney-Brittas Dunes and Fen SAC, which is defined by the following list of attributes and targets: • **Habitat Area** - Area stable or increasing, subject to natural processes, including erosion and succession; • **Habitat distribution** - No decline or change in habitat distribution, subject to natural processes; • **Physical structure: functionality and sediment supply** - Maintain the natural circulation of sediment and organic matter, without any physical obstructions; • **Vegetation structure: zonation** - Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession; • **Vegetation composition: typical species and sub-communities** - Maintain the presence of species-poor communities with typical vegetated		Perennial vegetation of stony banks [1220]	Elevated levels of ~~suspended sediment concentrations~~SSCs and associated ~~sediment~~ deposition, Accidental pollution, Changes to physical processes

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
		shingle flora including the range of subcommunities within the different zones; and • **Vegetation composition: negative indicator species** - Negative indicator species (including non-native species) to represent less than 5% cover.			
		To maintain the favourable conservation condition of Mediterranean salt meadows (*Juncetalia maritimi*) in Buckroney-Brittas Dunes and Fen SAC, which is defined by the following list of attributes and targets: • **Habitat Area** - Area stable or increasing, subject to natural processes, including erosion and succession; • **Habitat distribution** - No decline or change in habitat distribution, subject to natural processes; • **Physical structure: functionality and sediment supply** - Maintain the natural circulation of sediment and organic matter, without any physical obstructions; • **Physical structure**: creeks and pans - Maintain creek and pan structure, subject to natural processes including erosion and succession; • **Physical structure**: **flooding regime** – maintain natural tidal regime; • **Vegetation structure: zonation** - Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession; • **Vegetation structure: vegetation height** – maintain structural variation in the sward;		Mediterranean salt meadows (*Juncetalia maritimi*) [1410]	Elevated levels of ~~suspended sediment concentrations~~SSCs and associated ~~sediment~~ deposition, Accidental pollution, Changes to physical processes

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
		• **Vegetation structure: vegetation cover** - Maintain range of subcommunities with typical species; and • **Vegetation composition: negative indicator species – *Spartina anglica*** - There is no record of common cordgrass (*Spartina anglica*) in the SAC and its establishment should be prevented.			
		To restore the favourable conservation condition of Embryonic shifting dunes in Buckroney-Brittas Dunes and Fen SAC, which is defined by the following list of attributes and targets: • **Habitat area** – Area stable or increasing, subject to natural processes including erosion and succession; • **Habitat distribution** - No decline or change in habitat distribution, subject to natural processes; • **Physical structure: functionality and sediment supply** - Maintain the natural circulation of sediment and organic matter, without any physical obstructions; • **Vegetation structure: zonation** - Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession; • **Vegetation composition: plant health of foredune grasses** – More than 95% of sand couch grass (*Elytrigia juncea*) and/or lyme-grass (*Leymus arenarius*) should be healthy (i.e., green plant parts above ground and flowering heads present);		Embryonic shifting dunes [2110]	Elevated levels of ~~suspended sediment concentrations~~SSCs and associated ~~sediment~~ deposition, Accidental pollution, Changes to physical processes

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
		• **Vegetation composition: typical species and subcommunities** - Maintain the presence of species-poor communities with typical species: sand couch grass (*Elytrigia juncea*) and/or lyme-grass (*Leymus arenarius*); and • **Vegetation composition: negative indicator species** - Negative indicator species (including non-native species) to represent less than 5% cover.			
		To restore the favourable conservation condition of Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) in Buckroney-Brittas Dunes and Fen SAC, which is defined by the following list of attributes and targets: • **Habitat area** – Area stable or increasing, subject to natural processes including erosion and succession; • **Habitat distribution** - No decline or change in habitat distribution, subject to natural processes; • **Physical structure: functionality and sediment supply** - Maintain the natural circulation of sediment and organic matter, without any physical obstructions; • **Vegetation structure: zonation** - Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession; • **Vegetation composition: plant health of foredune grasses** – More than 95% of marram grass (*Ammophila arenaria*) and/or lyme-grass (Leymus arenarius) should be healthy (i.e., green		Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120]	Elevated levels of ~~suspended sediment concentrations~~SSCs and associated ~~sediment~~ deposition, Accidental pollution, Changes to physical processes

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
		plant parts above ground and flowering heads present); • **Vegetation composition: typical species and subcommunities** - Maintain the presence of species-poor communities dominated by marram grass (*Ammophila arenaria*) and/or lyme-grass (Leymus arenarius); and • **Vegetation composition: negative indicator species -** Negative indicator species (including non-native species) to represent less than 5% cover.			
		To maintain the favourable conservation condition of Fixed coastal dunes with herbaceous vegetation (grey dunes)* in Buckroney-Brittas Dunes and Fen SAC, which is defined by the following list of attributes and targets: • **Habitat area** – Area stable or increasing, subject to natural processes including erosion and succession; • **Habitat distribution** - No decline or change in habitat distribution, subject to natural processes; • **Physical structure: functionality and sediment supply** - Maintain the natural circulation of sediment and organic matter, without any physical obstructions; • **Vegetation structure: zonation** - Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession;		Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]	Elevated levels of ~~suspended sediment concentrations~~SSCs and associated ~~sediment~~ deposition, Accidental pollution, Changes to physical processes

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
		• **Vegetation structure: bare ground** - Bare ground should not exceed 10% of fixed dune habitat, subject to natural processes; • **Vegetation structure: sward heigh** - Maintain structural variation within sward; • **Vegetation composition: typical species and subcommunities** - Maintain range of subcommunities with typical species; • **Vegetation composition: negative indicator species (including *Hippophae rhamnoides*)** - Negative indicator species (including non-native species) to represent less than 5% cover; and • **Vegetation composition: scrub/trees** – No more than 5% cover under control.			
		To restore the favourable conservation condition of Atlantic decalcified fixed dunes (*Calluno-Ulicetea*) in Buckroney-Brittas Dunes and Fen SAC, which is defined by the following list of attributes and targets: • **Habitat area** – Area stable or increasing, subject to natural processes including erosion and succession; • **Habitat distribution** - No decline or change in habitat distribution, subject to natural processes; • **Physical structure: functionality and sediment supply** - Maintain the natural circulation **of** sediment and organic matter, without any physical obstructions; • **Vegetation structure: zonation** - Maintain the range of coastal habitats including transitional		Atlantic decalcified fixed dunes *(Calluno-Ulicetea*) [2150]	Elevated levels of ~~suspended sediment concentrations~~SSCs and associated ~~sediment~~ deposition, Accidental pollution, Changes to physical processes

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
		zones, subject to natural processes including erosion and succession; • **Vegetation structure: bare ground** - Bare ground should not exceed 10% of dune habitat, subject to natural processes; • **Vegetation structure: sward heigh** - Maintain structural variation within sward; • **Vegetation composition: typical species and subcommunities** - Maintain range of subcommunities with typical species; • **Vegetation composition: negative indicator species** - Negative indicator species (including non-native species) to represent less than 5% cover; and • **Vegetation composition: scrub/trees** – No more than 5% cover under control.			
		To maintain the favourable conservation condition of Dunes with *Salix repens* ssp. *argentea* (*Salicion arenariae*) in Buckroney-Brittas Dunes and Fen SAC, which is defined by the following list of attributes and targets: • **Habitat area** – Area stable or increasing, subject to natural processes including erosion and succession; • **Habitat distribution** - No decline or change in habitat distribution, subject to natural processes; • **Physical structure: functionality and sediment supply** - Maintain the natural circulation of sediment and organic matter, without any physical obstructions;		Dunes with Salix repens ssp. argentea (*Salicion arenariae*) [2170]	Elevated levels of ~~suspended sediment concentrations~~SSCs and associated ~~sediment~~ deposition, Accidental pollution, Changes to physical processes

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
		• **Vegetation structure: zonation** - Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession; • **Vegetation structure: bare ground** - Bare ground should not exceed 10% cover, subject to natural processes; • **Vegetation structure: sward heigh** - Maintain structural variation within sward; • **Vegetation composition: typical species and subcommunities** - Maintain range of subcommunities with typical species; • **Vegetation composition**: **cover and height of *Salix repens*** - Maintain more than 10% cover of creeping willow (*Salix repens*); vegetation height should be in the average range of 5-20 cm; • **Vegetation composition: negative indicator species (including *Hippophae rhamnoides*)** - Negative indicator species (including non-native species) to represent less than 5% cover; and • **Vegetation composition: scrub/trees** - For trees and scrub other than creeping willow (*Salix repens*), there should be no more than 5% cover or their presence should be under control.			
		To restore the favourable conservation condition of Humid dune slacks in Buckroney-Brittas Dunes and Fen SAC, which is defined by the following list of attributes and targets: • **Habitat area** – Area stable or increasing, subject to natural processes including erosion and succession;		Humid dune slacks [2190]	Elevated levels of ~~suspended sediment concentrations~~SSCs and associated ~~sediment~~ deposition, Accidental pollution,

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
		• **Habitat distribution** - No decline or change in habitat distribution, subject to natural processes; • **Physical structure: functionality and sediment supply** - Maintain the natural circulation of sediment and organic matter, without any physical obstructions; • **Physical structure: hydrological and flooding regime** - Maintain natural hydrological regime; • **Vegetation structure: zonation** - Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession. • **Vegetation structure: bare ground** - Bare ground should not exceed 5% of dune slack habitat, with the exception of pioneer slacks which can have up to 20% bare ground; • **Vegetation structure: sward height** - Maintain structural variation within sward; • **Vegetation composition: typical species and subcommunities** - Maintain range of subcommunities with typical species; • **Vegetation composition: cover of *Salix repens*** – Maintain less than 40% cover of creeping willow (*Salix repens*); • **Vegetation composition: negative indicator species** - Negative indicator species (including non-native species) to represent less than 5% cover; and • **Vegetation composition: scrub/trees** – No more than 5% cover under control.			Changes to physical processes

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
Kilpatrick Sandhills SAC	~~6.8~~6.80	To maintain the favourable conservation condition of Annual vegetation of drift lines in Kilpatrick Sandhills SAC, which is defined by the following list of attributes and targets: • **Habitat area -** Area stable or increasing, subject to natural processes, including erosion and succession; • **Habitat distribution -** No decline or change in habitat distribution, subject to natural processes; • **Physical structure: functionality and sediment supply -** Maintain the natural circulation of sediment and organic matter, without any physical obstructions; • **Vegetation structure: zonation** - Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession; • **Vegetation composition: typical species and subcommunities -** Maintain the presence of species-poor communities with typical species: sea rocket (*Cakile maritima*), sea sandwort (*Honckenya peploides*), prickly saltwort (*Salsola kali*) and oraches (*Atriplex* spp.); and • **Vegetation composition: negative indicator species -** Negative indicator species (including non-native species) to represent less than 5% cover.	~~(~~NPWS~~,~~ (2017c)	Annual vegetation of drift lines [1210]	Elevated levels of ~~suspended sediment concentrations~~SSCs and associated ~~sediment~~ deposition, Accidental pollution, Changes to physical processes
		To maintain the favourable conservation condition of Embryonic shifting dunes in Kilpatrick Sandhills SAC, which is defined by the following list of attributes and targets:		Embryonic shifting dunes [2110]	Elevated levels of ~~suspended sediment concentrations~~SSCs and associated ~~sediment~~ deposition,

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
		• **Habitat area -** Area stable or increasing, subject to natural processes, including erosion and succession; • **Habitat distribution -** No decline or change in habitat distribution, subject to natural processes; • **Physical structure: functionality and sediment supply -** Maintain the natural circulation of sediment and organic matter, without any physical obstructions; • **Vegetation structure: zonation** - Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession; • **Vegetation composition: plant health of foredune grasses** - More than 95% of sand couch grass (*Elytrigia juncea*) and/or lyme-grass (*Leymus arenarius*) should be healthy (i.e., green plant parts above ground and flowering heads present); • **Vegetation composition: typical species and subcommunities -** Maintain the presence of species-poor communities with typical species: sand couch grass (Elytrigia juncea) and/or lyme-grass (Leymus arenarius); and • **Vegetation composition: negative indicator species -** Negative indicator species (including non-native species) to represent less than 5% cover.			Accidental pollution, Changes to physical processes
		To restore the favourable conservation condition of Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) in Kilpatrick Sandhills SAC,		Shifting dunes along the shoreline with	Elevated levels of ~~suspended sediment concentrations~~SSCs and associated ~~sediment~~ deposition,

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
		which is defined by the following list of attributes and targets: • **Habitat area -** Area stable or increasing, subject to natural processes, including erosion and succession; • **Habitat distribution -** No decline or change in habitat distribution, subject to natural processes; • **Physical structure: functionality and sediment supply -** Maintain the natural circulation of sediment and organic matter, without any physical obstructions; • **Vegetation structure: zonation** - Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession; • **Vegetation composition: plant health of dune grasses -** More than 95% of marram grass (*Ammophila arenaria*) and/or lyme-grass (*Leymus arenarius*) should be healthy (i.e., green plant parts above ground and flowering heads present); • **Vegetation composition: typical species and subcommunities -** Maintain the presence of species-poor communities dominated by marram grass (*Ammophila arenaria*) and/or lyme-grass (*Leymus arenarius*); and • **Vegetation composition: negative indicator species** - Negative indicator species (including non-native species) to represent less than 5% cover.		*Ammophila arenaria* (white dunes) [2120]	Accidental pollution, Changes to physical processes

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
		To restore the favourable conservation condition of Fixed coastal dunes with herbaceous vegetation (grey dunes)* in Kilpatrick Sandhills SAC, which is defined by the following list of attributes and targets: • **Habitat area** – Area stable or increasing, subject to natural processes including erosion and succession; • **Habitat distribution** - No decline or change in habitat distribution, subject to natural processes; • **Physical structure: functionality and sediment supply** - Maintain the natural circulation of sediment and organic matter, without any physical obstructions; • **Physical structure: hydrological and flooding regime** - Maintain natural hydrological regime; • **Vegetation structure: zonation** - Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession; • **Vegetation structure: bare ground** - Bare ground should not exceed 5% of dune slack habitat, with the exception of pioneer slacks which can have up to 20% bare ground; • **Vegetation structure: sward height** - Maintain structural variation within sward; • **Vegetation composition: typical species and subcommunities** - Maintain range of subcommunities with typical species; • **Vegetation composition: negative indicator species** - Negative indicator species (including		Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]	Elevated levels of ~~suspended sediment concentrations~~SSCs and associated ~~sediment~~ deposition, Accidental pollution, Changes to physical processes

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
		non-native species) to represent less than 5% cover; and • **Vegetation composition: scrub/trees** - No more than 5% cover or under control.			
		To restore the favourable conservation condition of Atlantic decalcified fixed dunes (*Calluno-Ulicetea*)* in Kilpatrick Sandhills SAC, which is defined by the following list of attributes and targets: • **Habitat area -** Area stable or increasing, subject to natural processes, including erosion and succession; • **Habitat distribution -** No decline or change in habitat distribution, subject to natural processes; • **Physical structure: functionality and sediment supply -** Maintain the natural circulation of sediment and organic matter, without any physical obstructions; • **Vegetation structure: zonation** - Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession; • **Vegetation composition: plant health of dune grasses** - More than 95% of marram grass (*Ammophila arenaria*) and/or lyme-grass (*Leymus arenarius*) should be healthy (i.e., green plant parts above ground and flowering heads present); • **Vegetation composition: typical species and subcommunities -** Maintain the presence of species-poor communities dominated by marram grass (*Ammophila arenaria*) and/or lyme-grass (*Leymus arenarius*);		Atlantic decalcified fixed dunes (*Calluno-Ulicetea*) [2150	Elevated levels of ~~suspended sediment concentrations~~SSCs and associated ~~sediment~~ deposition, Accidental pollution, Changes to physical processes

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
		• **Vegetation composition: negative indicator species** - Negative indicator species (including non-native species) to represent less than 5% cover; and • **Vegetation composition: scrub/trees** - No more than 5% cover or under control.			
The Murrough Wetlands SAC	~~11.15~~10.25	To restore the favourable conservation condition of Annual vegetation of drift lines in The Murrough Wetlands SAC, which is defined by the following list of attributes and targets: • **Habitat area** - Area stable or increasing, subject to natural processes, including erosion and succession; • **Habitat distribution** - No decline or change in habitat distribution, subject to natural processes; • **Physical structure: functionality and sediment supply** - Maintain the natural circulation of sediment and organic matter, without any physical obstructions; • **Vegetation structure: zonation** - Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession; • **Vegetation composition: typical species and sub-communities -** Maintain the presence of species-poor communities with typical species: sea rocket (*Cakile maritima*), sea sandwort (*Honckenya peploides*), prickly saltwort (*Salsola kali*) and oraches (*Atriplex* spp.); • **Vegetation composition: native negative indicator species -** Native negative indicator	~~(~~NPWS~~,~~ (2021a)	Annual vegetation of drift lines [1210]	Elevated levels of ~~suspended sediment concentrations~~SSCs and associated ~~sediment~~ deposition, Accidental pollution, Changes to physical processes

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
		species cover in any individual monitoring stop should not be more than 25%; no negative indicator species should be present in more than 60% of monitoring stops; cover of negative indicator species across the whole site should not be more than 5%; and • **Vegetation composition: nonnative species -** Non-native species should not be present in more than 20% of monitoring stops.			
		To restore the favourable conservation condition of Perennial vegetation of stony banks in The Murrough Wetlands SAC, which is defined by the following list of attributes and targets: • **Habitat area** - Area stable or increasing, subject to natural processes, including erosion and succession; • **Habitat distribution** - No decline or change in habitat distribution, subject to natural processes; • **Physical structure: functionality and sediment supply** - Maintain the natural circulation of sediment and organic matter, without any physical obstructions; • **Vegetation structure: zonation** - Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession; • **Vegetation composition: communities and typical species -** Maintain the typical species within the range of vegetated shingle communities;		Perennial vegetation of stony banks [1220]	Elevated levels of ~~suspended sediment concentrations~~SSCs and associated ~~sediment~~ deposition, Accidental pollution, Changes to physical processes

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
		• **Vegetation composition: native negative indicator species -** Native negative indicator species cover in any individual monitoring stop should not be more than 25%; no negative indicator species should be present in more than 60% of monitoring stops; and • **Vegetation composition: nonnative species -** Non-native species cover in any individual monitoring stop should not be more than 1%; non-native species should not be present in more than 20% of monitoring stops; cover of non-native species across the whole site should not be more than 1%.			
		To restore the favourable conservation condition of Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) in The Murrough Wetlands SAC, which is defined by the following list of attributes and targets: • **Habitat area** - Area stable or increasing, subject to natural processes, including erosion and succession; • **Habitat distribution** - No decline or change in habitat distribution, subject to natural processes; • Physical structure: hydrology - No human disturbance; • **Vegetation structure: plant height -** Standard deviation of median plant height more than 5; • **Vegetation structure: disturbed ground -** Percentage cover at a representative number of 2 m x 2 m monitoring stops;		Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330]	Elevated levels of ~~suspended sediment concentrations~~SSCs and associated ~~sediment~~ deposition, Accidental pollution, Changes to physical processes

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
		• **Vegetation structure: zonation -** Adequate number of zones present, depending on geographical type of saltmarsh; • **Vegetation structure**: transitions - No loss of natural transitions; • **Vegetation composition**: typical species - Minimum of twelve typical • species recorded across all plots; • **Vegetation composition: negative species -** Spartina spp. have not been recorded in the habitat in this SAC and establishment should be prevented; • **Other negative indicators -** No signs of infilling, reclamation, turf-cutting or pollution or other negative indicators; and • **Indicators of local distinctiveness -** No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat.			
		To restore the favourable conservation condition of Mediterranean salt meadows (*Juncetalia maritimi*) in The Murrough Wetlands SAC, which is defined by the following list of attributes and targets: • **Habitat area** - Area stable or increasing, subject to natural processes, including erosion and succession; • **Habitat distribution** - No decline or change in habitat distribution, subject to natural processes; • **Physical structure**: hydrology - No human disturbance;		Mediterranean salt meadows (*Juncetalia maritimi*) [1410]	Elevated levels of ~~suspended sediment concentrations~~SSCs and associated ~~sediment~~ deposition, Accidental pollution, Changes to physical processes

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
		• **Vegetation structure: disturbed ground** - Cover of disturbed ground less than 5%; • **Vegetation structure: transitions** - No loss of natural transitions; • **Vegetation composition: typical species -** Minimum of six typical species recorded across all plots; minimum two typical species in more than 25% of plots (excluding *Juncus maritimus*); • **Vegetation composition: negative species -** Spartina spp. have not been recorded in the habitat in this SAC and establishment should be prevented; • **Other negative indicators -** No signs of infilling, reclamation, turf-cutting or pollution or other negative indicators; and • **Indicators of local distinctiveness -** No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat.			
Slaney River Valley SAC	~~44.54~~47.55	The status of the freshwater pearl mussel (*Margaritifera margaritifera*) as a qualifying Annex II species for the Slaney River Valley SAC is currently under review. The outcome of this review will determine whether a site-specific conservation objective is set for this species.	~~(~~NPWS~~,~~ (2011a)	Freshwater peal mussel *Margaritifera margaritifera* [1029]	Risk of disturbance or displacement to host species (Atlantic salmon)
		To restore the favourable conservation condition of Sea lamprey in the Slaney River Valley SAC, which is defined by the following list of attributes and targets:		Sea lamprey *Petromyzon marinus* [1095]	Underwater noise ~~and~~; Electro-magnetic fields (EMF); and

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
		• **Distribution: extent of anadromy** - Greater than 75% of main stem length of rivers accessible from estuary; • **Population structure of juveniles** - At least three age/size groups present; • **Juvenile density in fine sediment** - Juvenile density at least 1/m²; • **Extent and distribution of spawning habitat** - No decline in extent and distribution of spawning beds; and • **Availability of juvenile habitat** - More than 50% of sample sites positive.			Accidental pollution
		To restore the favourable conservation condition of River lamprey in the Slaney River Valley SAC, which is defined by the following list of attributes and targets: • **Distribution -** Access to all water courses down to first order streams; • **Population structure of juveniles -** At least three age/size groups of river/brook lamprey present; • **Juvenile density in fine sediment** - Mean catchment juvenile density of brook/river lamprey at least 2/m²; • **Extent and distribution of spawning habitat** - No decline in extent and distribution of spawning beds; and • **Availability of juvenile habitat** - More than 50% of sample sites positive		River lamprey *Lampetra fluviatilis* [1099]	Underwater noise; EMF; and ~~EMF~~Accidental pollution

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
		To restore the favourable conservation condition of Twaite shad in the Slaney River Valley SAC, which is defined by the following list of attributes and targets: • **Distribution: extent of anadromy** - Greater than 75% of main stem length of rivers accessible from estuary; • **Population structure: age classes** - More than one age class present; • **Extent and distribution of spawning habitat** - No decline in extent and distribution of spawning habitats; • **Water quality: oxygen levels** - No lower than 5 mg/l; and • **Spawning habitat quality: Filamentous algae; macrophytes; sediment** - Maintain stable gravel substrate with very little fine material, free of filamentous algal (macroalgae) growth and macrophyte (rooted higher plants) growth.		Twaite shad *Alosa fallax* [1103]	Underwater noise ~~and EMF~~; EMF; and Accidental pollution
		To restore the favourable conservation condition of Salmon in the Slaney River Valley SAC, which is defined by the following list of attributes and targets: • **Distribution: extent of anadromy -** 100% of river channels down to second order accessible from estuary; • **Adult spawning fish -** Conservation limit (CL) for each system consistently exceeded; • **Salmon fry abundance -** Maintain or exceed 0+ fry mean catchment-wide abundance threshold value. Currently set at 17 salmon fry/5 minutes sampling;		Salmon *Salmo salar* [1106]	Underwater noise; EMF; and ~~EMF~~Accidental pollution

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
		• **Out-migrating smolt abundance** - No significant decline; • **Number and distribution of redds -** No decline in number and distribution of spawning redds due to anthropogenic causes; and • **Water quality -** At least Q4 at all sites sampled by Environmental Protection Agency (EPA).			
		To restore the favourable conservation condition of harbour seal in the Slaney River Valley SAC, which is defined by the following list of attributes and targets: • **Access to suitable habitat -** Species range within the site should not be restricted by artificial barriers to site use; • **Breeding behaviour -** The breeding sites should be maintained in a natural condition; • **Moulting behaviour -** The moult haul-out sites should be maintained in a natural condition; • **Resting behaviour -** The resting haul-out sites should be maintained in a natural condition; and • **Disturbance -** Human activities should occur at levels that do not adversely affect the harbour seal population at the site.		Harbour seal (*Phoca vitulina*) [1365]	Underwater noise, ~~Underwater noise from UXO clearance,~~ ~~Underwater noise~~Injury risk from ~~other~~vessel activities , ~~Collision Risk,~~ Accidental pollution, and Changes in prey
Cahore Polders and Dunes SAC	18.19	To restore the favourable conservation condition of Annual vegetation of drift lines in Cahore Polders and Dunes SAC, which is defined by the following list of attributes and targets: • **Habitat area -** Area stable or increasing, subject to natural processes, including erosion and succession;	NPWS (2016)	Annual vegetation drift lines [1210]	Elevated levels of SSCs and associated deposition, Accidental pollution, Changes to physical processes

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
		• **Habitat distribution** - No decline or change in habitat distribution, subject to natural processes; • **Physical structure: functionality and sediment supply -** Maintain the natural circulation of sediment and organic matter, without any physical obstructions; • **Vegetation structure: zonation** - Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession; • **Vegetation composition: typical species and sub-communities** - Maintain the presence of species-poor communities with typical species: sea rocket (*Cakile maritima*), sea sandwort (*Honckenya peploides*), prickly saltwort (*Salsola kali*) and oraches (*Atriplex* spp.); • **Vegetation composition: negative indicator species** - Negative indicator species (including non-native species) to represent less than 5% cover.			
~~Cahore Polders and Dunes SAC~~	~~18.19~~	To restore the favourable conservation condition of Embryonic shifting dunes in Cahore Polders and Dunes SAC, which is defined by the following list of attributes and targets: • **Habitat area -** Area stable or increasing, subject to natural processes, including erosion and succession; • **Habitat distribution** - No decline or change in habitat distribution, subject to natural processes; • **Physical structure: functionality and sediment supply -** Maintain the natural circulation of	~~(NPWS, 2016)~~	Embryonic shifting dunes [2110]	Elevated levels of ~~suspended sediment concentrations~~SSCs and associated ~~sediment~~ deposition, Accidental pollution, Changes to physical processes

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
		sediment and organic matter, without any physical obstructions; • **Vegetation structure: zonation** - Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession; • **Vegetation composition: plant health of foredune grasses -** More than 95% of sand couch grass (*Elytrigia juncea*) and/or lyme-grass (*Leymus arenarius*) should be healthy (i.e., green plant parts above ground and flowering heads present); • **Vegetation composition: typical species and subcommunities** - Maintain the presence of species-poor communities with typical species: sand couch grass (Elytrigia juncea) and/or lyme-grass (Leymus arenarius); and • **Vegetation composition: negative indicator species -** Negative indicator species (including non-native species) to represent less than 5% cover.			
		To restore the favourable conservation condition of Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) in Cahore Polders and Dunes SAC, which is defined by the following list of attributes and targets: • **Habitat area -** Area stable or increasing, subject to natural processes, including erosion and succession; • **Habitat distribution** - No decline or change in habitat distribution, subject to natural processes;		Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120]	Elevated levels of ~~suspended sediment concentrations~~SSCs and associated ~~sediment~~ deposition, Accidental pollution, Changes to physical processes

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
		• **Physical structure: functionality and sediment supply** - Maintain the natural circulation of sediment and organic matter, without any physical obstructions; • **Vegetation structure: zonation** - Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession; • **Vegetation composition: plant health of foredune grasses** - More than 95% of sand couch grass (*Elytrigia juncea*) and/or lyme-grass (*Leymus arenarius*) should be healthy (i.e., green plant parts above ground and flowering heads present); • **Vegetation composition: typical species and subcommunities -** Maintain the presence of species-poor communities with typical species: sand couch grass (*Elytrigia juncea*) and/or lyme-grass (*Leymus arenarius*); and • **Vegetation composition: negative indicator species -** Negative indicator species (including non-native species) to represent less than 5% cover.			
		To restore the favourable conservation condition of Fixed coastal dunes with herbaceous vegetation (grey dunes)* in Cahore Polders and Dunes SAC, which is defined by the following list of attributes and targets: • **Habitat area -** Area stable or increasing, subject to natural processes, including erosion and succession;		Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]	Elevated levels of ~~suspended sediment concentrations~~SSCs and associated ~~sediment~~ deposition, Accidental pollution, Changes to physical processes

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
		• **Habitat distribution** - No decline or change in habitat distribution, subject to natural processes; • **Physical structure: functionality and sediment supply -** Maintain the natural circulation of sediment and organic matter, without any physical obstructions; • **Vegetation structure: zonation** - Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession; • **Vegetation structure: bare ground -** Bare ground should not exceed 10% of fixed dune habitat, subject to natural processes; • **Vegetation structure: sward height -** Maintain structural variation within sward; • **Vegetation composition**: typical species and subcommunities - Maintain range of subcommunities with typical Species; and • **Vegetation composition: negative indicator species –** Negative indicator species (including non-native species) to represent less than 5% cover.			
		No conservation objectives available.		Humid dune slacks [2190]	Elevated levels of ~~suspended sediment concentrations~~SSCs and associated ~~sediment~~ deposition, Accidental pollution, Changes to physical processes

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
Blackwater Bank SAC	~~19.76~~19.13	To maintain the favourable conservation condition of Sandbanks which are slightly covered by sea water all the time in Blackwater Bank SAC, which is defined by the following list of attributes and targets: • **Habitat area –** The permanent habitat area is stable or increasing, subject to natural processes; • **Habitat distribution –** The distribution of sandbanks is stable or increasing, subject to natural processes; and • **Community distribution –** Conserve the following community type in a natural condition: Sand with *Nephtys cirrosa* and *Bathyporeia elegans* community complex.	~~(~~NPWS~~,~~ ~~2023~~ (2024a)	Sandbanks which are slightly covered by sea water all the time [1110]	Elevated levels of ~~suspended sediment concentrations~~SSCs and associated ~~sediment~~ deposition, Accidental pollution, Changes to physical processes
		To maintain the favourable conservation condition of harbour porpoise in Blackwater Bank SAC, which is defined by the following list of attributes and targets: • **Access to suitable habitat** – Species range within the site should not be restricted by artificial barriers to site use; and • ~~No conservation objectives available for this feature at this time. Assessment will be based upon the COs of the closest designated site with the same qualifying feature that has COs, within the same population community (MU).~~**Disturbance** – Human activities should occur at levels that do not adversely affect the harbour porpoise community at the site.		Harbour porpoise (*Phocoena phocoena*) [1351]	Underwater noise, ~~Underwater noise from UXO clearance,~~ ~~Underwater noise~~Injury risk from ~~other~~vessel activities, ~~Collision Risk,~~ Accidental pollution, EMF, and Changes in prey.

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
Rockabill to Dalkey Island SAC	~~70.39~~35.66	To maintain the favourable conservation condition of harbour porpoise in Rockabill to Dalkey Island SAC, which is defined by the following list of attributes and targets: • **Access to suitable habitat -** Species range within the site should not be restricted by artificial barriers to site use; and • **Disturbance -** Human activities should occur at levels that do not adversely affect the harbour porpoise community at the site.	~~(~~NPWS~~,~~ (2013c)	Harbour porpoise (*Phocoena phocoena*) [1351]	Underwater noise, ~~Underwater noise from UXO clearance,~~ ~~Underwater noise from other activities,~~ Collision risk, Accidental pollution, EMF, and Changes in prey.
Codling Fault Zone SAC	~~63.31~~43.90	To maintain the favourable conservation condition of harbour porpoise in Codling Fault Zone SAC, which is defined by the following list of attributes and targets: • **Access to suitable habitat** - Species range within the site should not be restricted by artificial barriers to site use; • ~~No conservation objectives available for this feature at this time. Assessment will be based upon the COs of the closest designated site with the same qualifying feature that has COs, within the same population community (MU).~~ **Disturbance** - Human activities should occur at levels that do not adversely affect the harbour porpoise community at the site.	~~N/A~~NPWS (2025a)	Harbour porpoise (*Phocoena phocoena*) [1351	Underwater noise, ~~Underwater noise from UXO clearance,~~ ~~Underwater noise~~Injury risk from ~~other~~vessel activities, ~~Collision Risk,~~ Accidental pollution, EMF, and Changes in prey .

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
West Wales Marine / Gorllewin Cymru Forol SAC (UK)	~~93.50~~49.75	To ensure that the integrity of the site is maintained and that it makes the best possible contribution to maintaining Favourable Conservation Status (FCS) for harbour porpoise in UK waters. In the context of natural change, this will be achieved by ensuring that: • **harbour porpoise is a viable component of the site** - The intent of this objective is to minimise the risk of injury and killing or other factors that could restrict the survivability and reproductive potential of harbour porpoise using the site; • **There is no significant disturbance of the species** - Operations within or affecting the site should be managed to ensure that the animals' potential usage of the site is maintained; and • **The condition of supporting habitats and processes, and the availability of prey is maintained** - The maintenance of supporting habitats and processes contributes to ensuring that prey is maintained within the site and is available to harbour porpoises using the site.	~~(~~NRW~~,~~ ~~2016~~ (2019a)	Harbour porpoise (*Phocoena phocoena*) [1351]	Underwater noise, ~~Underwater noise from UXO clearance,~~ ~~Underwater noise~~Injury risk from ~~other~~vessel activities, ~~Collision Risk,~~ Accidental pollution, EMF, and Changes in prey.
River Barrow and River Nore SAC	~~109.60~~125.42	To restore the Favourable conservation condition of the Freshwater pearl mussel (*Margaritifera margaritifera*) in River Barrow and River Nore SAC, which is defined by the following list of attributes and targets: • **Distribution: Ballymurphy** - Restore distribution at 3.91km; • **Distribution: Mountain** - Restore distribution at 9.45km;	~~(~~NPWS~~,~~ ~~2011b~~ (2025b)	Freshwater peal mussel *Margaritifera margaritifera* [1029]	Risk of disturbance or displacement to host species (Atlantic salmon)

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
		• **Distribution: Nore** - Restore distribution at 21.13km; • **Population size: Ballymurphy** - Restore Ballymurphy population to at least 1,000 adult mussels; • **Population size: Mountain** - Restore Mountain population to at least 4,000 adult mussels **Population size: Nore** - Restore Nore population to at least 5,000 adult mussels; • **Population structure: recruitment** - Restore to at least 20% of population no more than 65mm in length; and at least 5% of population no more than 30mm in length; • **Population structure: adult mortality. Ballymurphy** - No more than 5% decline from previous number of live adults counted; dead shells less than 1% of the adult population and scattered in distribution; • **Population structure: adult mortality. Mountain** - No more than 5% decline from previous number of live adults counted; dead shells less than 1% of the adult population and scattered in distribution; • **Population structure: adult mortality. Nore** - No more than 5% decline from previous number of live adults counted; dead shells less than 1% of the adult population and scattered in distribution; • **Suitable habitat: extent** - Restore suitable habitat in more than 3.91km in the Ballymurphy, 5.3km in the Mountain and 16.72km in the Nore system and any additional stretches necessary for salmonid spawning;			

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
		• **Suitable habitat: condition** - Restore condition of suitable habitat; • **Water quality: macroinvertebrates and phytobenthos (diatoms)** - Restore water quality- macroinvertebrates: EQR greater than 0.90 (Q4-5 or Q5); phytobenthos: EQR greater than 0.93; • **Substratum quality: filamentous algae (macroalgae); macrophytes (rooted higher plants**) - Restore substratum quality- filamentous algae: absent or trace (less than 5%); macrophytes: absent or trace (less than 5%); • **Substratum quality: sediment** - Restore substratum quality- stable cobble and gravel substrate with very little fine material; no artificially elevated levels of fine sediment; • **Substratum quality: oxygen availability** - Restore to no more than 20% decline from water column to 5cm depth in substrate; • **Hydrological regime: flow variability** - Restore appropriate hydrological regime; **Host fish** - Maintain sufficient juvenile salmonids to host glochidial larvae; • ~~The status of the freshwater pearl mussel (*Margaritifera margaritifera*) as a qualifying Annex II species for the River Barrow and River Nore SAC is currently under review. The outcome of this review will determine whether a site-specific conservation objective is set for this species. Please note that the Nore freshwater pearl mussel (*Margaritifera durrovensis*) remains a qualifying species for this SAC. This document contains a conservation objective for the latter~~			

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
		~~species.~~**Fringing habitat: area and condition** - Restore the area and condition of fringing habitats necessary to support the population.			
		To restore the favourable conservation condition of Sea lamprey in the River Barrow and River Nore SAC, which is defined by the following list of attributes and targets: • **Distribution: extent of anadromy** - Greater than 75% of main stem length of rivers accessible from estuary; • **Population structure of juveniles** - At least three age/size groups present; • **Juvenile density in fine sediment** - Juvenile density at least 1/m²; • **Extent and distribution of spawning habitat** - No decline in extent and distribution of spawning beds; and • **Availability of juvenile habitat** - More than 50% of sample sites positive.		Sea lamprey *Petromyzon marinus* [1095]	Underwater noise; EMF; and ~~EMF~~Accidental pollution
		To restore the favourable conservation condition of River lamprey in the River Barrow and River Nore SAC, which is defined by the following list of attributes and targets: • **Distribution -** Access to all water courses down to first order streams; • **Population structure of juveniles -** At least three age/size groups of river/brook lamprey present;		River lamprey *Lampetra fluviatilis* [1099]	Underwater noise; EMF; and ~~EMF~~Accidental pollution

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
		• **Juvenile density in fine sediment** - Mean catchment juvenile density of brook/river lamprey at least 2/m²; • **Extent and distribution of spawning habitat** - No decline in extent and distribution of spawning beds; and • **Availability of juvenile habitat** - More than 50% of sample sites positive.			
		To restore the favourable conservation condition of Twaite shad in the River Barrow and River Nore SAC, which is defined by the following list of attributes and targets: • **Distribution: extent of anadromy** - Greater than 75% of main stem length of rivers accessible from estuary; • **Population structure: age classes** - More than one age class present; • **Extent and distribution of spawning habitat** - No decline in extent and distribution of spawning habitats; • **Water quality: oxygen levels** - No lower than 5 mg/l; and • **Spawning habitat quality: Filamentous algae; macrophytes; sediment** - Maintain stable gravel substrate with very little fine material, free of filamentous algal (macroalgae) growth and macrophyte (rooted higher plants) growth.		Twaite shad *Alosa fallax* [1103]	Underwater noise; EMF; and ~~EMF~~Accidental pollution
		To restore the favourable conservation condition of Salmon in the River Barrow and River Nore SAC,		Salmon *Salmo salar* [1106]	Underwater noise;

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
		which is defined by the following list of attributes and targets: • **Distribution: extent of anadromy -** 100% of river channels down to second order accessible from estuary; • **Adult spawning fish -** Conservation limit (CL) for each system consistently exceeded; • **Salmon fry abundance -** Maintain or exceed 0+ fry mean catchment-wide abundance threshold value. Currently set at 17 salmon fry/5 minutes sampling; • **Out-migrating smolt abundance** - No significant decline; • **Number and distribution of redds -** No decline in number and distribution of spawning redds due to anthropogenic causes; and • **Water quality -** At least Q4 at all sites sampled by EPA.			EMF; and ~~EMF~~Accidental pollution
North Anglesey Marine / Gogledd Môn Forol SAC (UK)	~~114.17~~61.61	To ensure that the integrity of the site is maintained and that it makes the best possible contribution to maintaining Favourable Conservation Status (FCS) for harbour porpoise in UK waters. In the context of natural change, this will be achieved by ensuring that: • **harbour porpoise is a viable component of the site** - The intent of this objective is to minimise the risk of injury and killing or other factors that could restrict the survivability and reproductive potential of harbour porpoise using the site; • **There is no significant disturbance of the species** - Operations within or affecting the site	~~(~~NRW~~,~~ ~~2019~~ (2019b)	Harbour porpoise (*Phocoena phocoena*) [1351]	Underwater noise, ~~Underwater noise from UXO clearance,~~ ~~Underwater noise~~Injury risk from ~~other~~vessel activities, ~~Collision Risk,~~ Accidental pollution, EMF, and

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
		should be managed to ensure that the animals' potential usage of the site is maintained; and • **The condition of supporting habitats and processes, and the availability of prey is maintained** - The maintenance of supporting habitats and processes contributes to ensuring that prey is maintained within the site and is available to harbour porpoises using the site.			Changes in prey.
Lambay Island SAC	~~62.87~~61.89	To maintain the favourable conservation condition of grey seal in Lambay Island SAC, which is defined by the following list of attributes and targets: • **Access to suitable habitat** - Species range within the site should not be restricted by artificial barriers to site use; • **Breeding behaviour** - The breeding sites should be maintained in a natural condition; • **Moulting behaviour** - The moult haul-out sites should be maintained in natural condition; • **Resting behaviour** - The resting haul-out sites should be maintained in a natural condition; and ~~**Population composition** - The grey seal population occurring within this site should contain adult, juvenile and pup cohorts annually; and~~ • **Disturbance** - Human activities should occur at levels that do not adversely affect the grey seal population at the site.	~~(~~NPWS~~,~~ (2024b; 2013b)	Grey seal (*Halichoerus grypus*) [1364]	Underwater noise, ~~Underwater noise from UXO clearance,~~ ~~Underwater noise~~Injury risk from ~~other~~vessel activities, ~~Collision Risk,~~ Accidental pollution, and Changes in prey.
		To maintain the favourable conservation condition of harbour porpoise in Lambay Island SAC, which is defined by the following list of attributes and targets:		Harbour porpoise (*Phocoena phocoena*) [1351]	Underwater noise,

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
		• **Access to suitable habitat -** Species range within the site should not be restricted by artificial barriers to site use; • ~~No conservation objectives available for this feature at this time. Assessment will be based upon the COs of the closest designated site with the same qualifying feature that has COs, within the same population community (MU).~~ **Disturbance** - Human activities should occur at levels that do not adversely affect the harbour porpoise community at the site.			~~Underwater noise from UXO clearance,~~ ~~Underwater noise~~Injury risk from ~~other~~vessel activities, ~~Collision Risk,~~ Accidental pollution, EMF, and Changes in prey.
Saltee Islands SAC	~~90.70~~93.38	To maintain the favourable conservation condition of grey seal in the Saltee Islands SAC, which is defined by the following list of attributes and targets: • **Access to suitable habitat** - Species range within the site should not be restricted by artificial barriers to site use; • **Breeding behaviour** - The breeding sites should be maintained in a natural condition; • **Moulting behaviour** - The moult haul-out sites should be maintained in natural condition; • **Resting behaviour** - The resting haul-out sites should be maintained in a natural condition; • **Population composition** - The grey seal population occurring within this site should contain adult, juvenile and pup cohorts annually; and	~~(~~NPWS~~,~~ (2011c)	Grey seal (*Halichoerus grypus*) [1364]	Underwater noise, ~~Underwater noise from UXO clearance,~~ ~~Underwater noise~~Injury risk from ~~other~~vessel activities, ~~Collision Risk,~~ Accidental pollution, and Changes in prey.

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
		• **Disturbance** - Human activities should occur at levels that do not adversely affect the grey seal population.			
Pen Llyn a`r Sarnau / Lleyn Peninsula and the Sarnau SAC (UK)	~~73.32~~71.35	The grey seal *Halichoerus grypus* QI within Pen Llŷn a'r Sarnau SAC are currently in favourable condition (medium confidence). Below are the attributes and targets for each conservation objective. **Objective 1:** The grey seal population that use the SAC is maintained in favourable condition and stable or increasing over the medium and long term: • **Population using the SAC -** Maintain the grey seal population that use the SAC in favourable condition, and stable or increasing in the medium and long term; and • **SAC pup production -** Maintain a stable or increasing grey seal pup production within the SAC in the medium and long term, including at important pupping sites. **Objective 2:** The grey seal population that use the SAC continue to have access to, and be able to utilise habitats necessary to maintain the population in favourable condition: • **Distribution of grey seal pupping sites within the SAC** - Maintain a stable or increasing grey seal pupping distribution across the SAC. Allowing for natural change and variation; • **Accessibility to habitat used by seals** – Grey seal that use the SAC should not be significantly constrained from accessing necessary habitats within or outside of the site; and	~~(~~NRW~~,~~ ~~2018a~~ (2025a)	Grey seal (*Halichoerus grypus*) [1364]	Underwater noise, ~~Underwater noise from UXO clearance,~~ ~~Underwater noise~~Injury risk from ~~other~~vessel activities, ~~Collision Risk,~~ Accidental pollution, and Changes in prey.

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
		• **Anthropogenic disturbance** – Grey seal that use the SAC should not be subject to significant anthropogenic disturbance within or outside of the site. **Objective 3:** The grey seal population that use the SAC have high quality habitat and sufficient food supply to support and maintain the population in favourable condition: ~~To achieve favourable conservation status all the following, subject to natural processes, need to be fulfilled and maintained in the long-term. If these objectives are not met restoration measures will be needed to achieve favourable conservation status.~~ ~~**Populations –** The population is maintaining itself on a long-term basis as a viable component of its natural habitat. Important elements include:~~ ~~• population size;~~ ~~• structure, production; and~~ ~~• condition of the species within the site.~~ ~~**Range** – The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future;~~ ~~**Supporting habitats and species** – The presence, abundance, condition and diversity of habitats and species required to support this species is such that the distribution, abundance and populations dynamics of the species within the site and population beyond the site is stable or increasing. Important considerations include;~~ ~~• distribution;~~			

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
		~~• extent;~~ ~~• structure;~~ • ~~function and~~**Habitat quality and function** - Maintain the quality and functionality of habitat to support the grey seal population that use the SAC in favourable condition;~~ and~~ • **Prey availability** – Maintain the quality, abundance and diversity of prey needed for the grey seal population that use the SAC to remain in favourable condition; and ~~• prey availability and quality.~~ • ~~**Restoration and recovery** – As part of this objective it should be noted that for the bottlenose dolphin and otter, populations should be increasing.~~**Water, sediment and prey contaminants** – Contaminants are at levels not detrimental to grey seal populations that use the SAC.			
		The bottlenose dolphin *Tursiops truncatus* QI within Pen Llŷn a'r Sarnau SAC is currently in favourable condition (low confidence). Below are the attributes and targets for each conservation objective. **Objective 1:** The bottlenose dolphin population that use the SAC is maintained in favourable condition and stable or increasing over the medium and long term: • **Population using the SAC** – Maintain the bottlenose dolphin population that use the SAC in favourable condition, and stable or increasing in the medium and long term. Population demographics such as reproductive success and		Bottlenose dolphin (*Tursiops truncatus*) [1349]	Underwater noise, ~~Underwater noise from UXO clearance,~~ ~~Underwater noise~~Injury risk from ~~other~~vessel activities, ~~Collision Risk,~~ Accidental pollution, EMF, and

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
		survival rates are at levels needed for the population to be maintained in favourable condition; and • **SAC residency** - Maintain bottlenose dolphin residency in the SAC over the medium and long term. **Objective 2:** The bottlenose dolphin population that use the SAC continue to have access to and be able to utilise habitats necessary to maintain the population in favourable condition: • **Accessibility to habitat used by bottlenose dolphin** - Bottlenose dolphins that use the SAC should not be significantly constrained from accessing necessary habitats within or outside of the site; and • **Anthropogenic disturbance** - Bottlenose dolphins that use the SAC should not be subject to significant anthropogenic disturbance within or outside of the site. **Objective 3**: The bottlenose dolphin population that use the SAC have high quality habitat and sufficient food supply to support and maintain the population in favourable condition: • **Habitat quality and function** – Maintain the quality and functionality of habitat to support the bottlenose dolphin population that use the SAC in favourable condition; • **Prey availability** – Maintain the quality, abundance and diversity of prey needed for the bottlenose dolphin population that use the SAC to remain in favourable condition; and			Changes in prey.

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
		• **Water, sediment and prey contaminants** – Contaminants are at levels not detrimental to the bottlenose dolphin population that use the SAC.			
Carnsore Point SAC	~~73.83~~50.08	To maintain favourable conservation condition of harbour porpoise in Carnsore Point SAC, which is defined by the following list of attributes and targets: • **Access to suitable habitats** – Species range within the site should not be restricted by artificial barriers to site use; and • ~~No conservation objectives available for this feature at this time. Assessment will be based upon the COs of the closest designated site with the same qualifying feature that has COs, within the same population community (MU).~~**Disturbance** – Human activities should not occur at levels that do not adversely affect the harbour porpoise community at the site.	~~N/A~~NPWS (2024c)	Harbour porpoise (*Phocoena phocoena*) [1351]	Underwater noise, ~~Underwater noise from UXO clearance,~~ ~~Underwater noise~~Injury risk from ~~other~~vessel activities, ~~Collision Risk,~~ Accidental pollution, EMF, and Changes in prey.
Lower River Suir SAC	~~126.51~~192.63	To restore the favourable conservation condition of Freshwater Pearl Mussel in Lower River Suir SAC, which is defined by the following list of attributes and targets: • **Distribution** - Restore distribution to 10.4 km; • **Population size** - Restore population to at least 10,000 adult mussels; • **Population structure: recruitment** - Restore to at least 20% of each population no more than 65 mm in length; and at least 5% of each population no more than 30 mm in length;	~~(~~NPWS~~,~~ (2017d)	Freshwater peal mussel *Margaritifera margaritifera* [1029]	Risk of disturbance or displacement to host species (Atlantic salmon)

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
		• **Population structure: adult mortality** - No more than 5% decline from previous number of live adults counted; dead shells less than 1% of the adult population and scattered in distribution; • **Suitable habitat: extent** - Restore suitable habitat in more than 8.8 km in the Clodiagh system and any additional stretches necessary for salmonid spawning; • **Suitable habitat: condition** - Restore condition of suitable habitat; • **Water quality: macroinvertebrate and phytobenthos (diatoms)** - Restore water quality - macroinvertebrates: EQR greater than 0.90 (Q4-5 or Q5); phytobenthos: EQR greater than 0.93; • **Substratum quality: filamentous algae (macroalgae); macrophytes (rooted higher plants)** - Restore substratum quality - filamentous algae: absent or trace (less than 5%); macrophytes: absent or trace (less than 5%); • **Substratum quality: sediment** - Restore substratum quality - stable cobble and gravel substrate with very little fine material; no artificially elevated levels of fine sediment; • **Substratum quality: oxygen availability** - Restore to no more than 20% decline from water column to 5 cm depth in substrate; • **Hydrological regime: flow variability** - Maintain appropriate hydrological regime; • **Host fish** - Maintain sufficient juvenile salmonids to host glochidial larvae; and			

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
		• **Fringing habitat: area and condition** - Restore the area and condition of fringing habitats necessary to support the population.			
		To restore the favourable conservation condition of Sea Lamprey in Lower River Suir SAC, which is defined by the following list of attributes and targets: • **Distribution: extent of anadromy** - Greater than 75% of main stem length of rivers accessible from estuary; • **Population structure of juveniles** - At least three age/size groups present; • **Juvenile density in fine sediment** - Juvenile density at least 1/m²; • **Extent and distribution of spawning habitat** - No decline in extent and distribution of spawning beds; and • **Availability of juvenile habitat** - More than 50% of sample sites positive.		Sea lamprey *Petromyzon marinus* [1095]	Underwater noise, EMF, and ~~EMF~~Accidental pollution
		To restore the favourable conservation condition of River Lamprey in Lower River Suir SAC, which is defined by the following list of attributes and targets: • **Distribution -** Access to all water courses down to first order streams; • **Population structure of juveniles -** At least three age/size groups of river/brook lamprey present; • **Juvenile density in fine sediment** - Mean catchment juvenile density of brook/river lamprey at least 2/m²;		River lamprey *Lampetra fluviatilis* [1099]	Underwater noise, EMF, and ~~EMF~~Accidental pollution

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
		• **Extent and distribution of spawning habitat** - No decline in extent and distribution of spawning beds; and • **Availability of juvenile habitat** - More than 50% of sample sites positive.			
		To restore the favourable conservation condition of Twaite Shad in Lower River Suir SAC, which is defined by the following list of attributes and targets: • **Distribution: extent of anadromy** - Greater than 75% of main stem length of rivers accessible from estuary; • **Population structure: age classes** - More than one age class present; • **Extent and distribution of spawning habitat** - No decline in extent and distribution of spawning habitats; • **Water quality: oxygen levels** - No lower than 5 mg/l; and • **Spawning habitat quality: Filamentous algae; macrophytes; sediment** - Maintain stable gravel substrate with very little fine material, free of filamentous algal (macroalgae) growth and macrophyte (rooted higher plants) growth.		Twaite shad *Alosa fallax* [1103]	Underwater noise, EMF, and ~~EMF~~Accidental pollution
		To restore the favourable conservation condition of Atlantic Salmon in Lower River Suir SAC, which is defined by the following list of attributes and targets: • **Distribution: extent of anadromy** - 100% of river channels down to second order accessible from estuary;		Salmon *Salmo salar* [1106]	Underwater noise, EMF, and ~~EMF~~Accidental pollution

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
		• **Adult spawning fish -** Conservation limit (CL) for each system consistently exceeded; • **Salmon fry abundance -** Maintain or exceed 0+ fry mean catchment-wide abundance threshold value. Currently set at 17 salmon fry/5 minutes sampling; • **Out-migrating smolt abundance** - No significant decline; • **Number and distribution of redds -** No decline in number and distribution of spawning redds due to anthropogenic causes; and • **Water quality -** At least Q4 at all sites sampled by EPA.			
Cardigan Bay / Bae Ceredigion SAC (UK)	~~82.73~~82.05	The bottlenose dolphin QI within Cardigan Bay SAC is currently in favourable condition (medium confidence). Below are the attributes and targets for each conservation objective. **Objective 1:** The bottlenose dolphin population that use the SAC is maintained in favourable condition and stable or increasing over the medium and long term: • **Population using the SAC** – Maintain a stable or increasing population of bottlenose dolphins that use the SAC over the medium and long term. Population demographics, such as reproductive success and survival rates, are at levels needed for the population to be maintained in favourable condition; and • **SAC residency** – Maintained bottlenose dolphin residency in the SAC over the medium and long term.	~~(~~NRW~~,~~ ~~2018b~~ (2025b)	Bottlenose dolphin (*Tursiops truncatus*) [1349] ~~Grey seal *Halichoerus grypus* [1364]~~	Underwater noise ~~from UXO clearance~~, ~~Underwater noise~~Injury risk from ~~other~~vessel activities, ~~Collision Risk,~~ Accidental pollution, EMF (only bottlenose dolphin), and Changes in prey.

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
		Objective 2: The bottlenose dolphin population that use the SAC continue to have access to, and be able to utilise habitats necessary to maintain the population in favourable condition: • **Accessibility to habitat used by bottlenose dolphin** - Bottlenose dolphins that use the SAC should not be significantly constrained from accessing necessary habitats within or outside of the site; and • **Anthropogenic disturbance** – Bottlenose dolphins that use the SAC should not be subject to significant anthropogenic disturbance within or outside of the site. **Objective 3:** The bottlenose dolphin population that use the SAC have high quality habitat and sufficient food supply to support and maintain the population in favourable condition: ~~To achieve favourable conservation status all the following, subject to natural processes, need to be fulfilled and maintained in the long-term. If these objectives are not met restoration measures will be needed to achieve favourable conservation status.~~ ~~**Populations** - The population is maintaining itself on a long-term basis as a viable component of its natural habitat. Important elements include:~~ ~~• population size;~~ ~~• structure, production; and~~ ~~• condition of the species within the site.~~ ~~**Range** - The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future;~~			

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
		~~**Supporting habitats and species** – The presence, abundance, condition and diversity of habitats and species required to support this species is such that the distribution, abundance and populations dynamics of the species within the site and population beyond the site is stable or increasing. Important considerations include;~~ ~~• distribution;~~ ~~• extent;~~ ~~• structure;~~ • ~~function and~~**Habitat quality and function –** Maintain the quality and functionality of habitat to support the bottlenose dolphin population that use the SAC in favourable condition;~~ and~~ • **Prey availability –** Maintain the quality, abundance and diversity of prey needed for the bottlenose dolphin population that use the SAC to remain in favourable condition; and ~~• prey availability and quality.~~ • ~~**Restoration and recovery** – As part of this objective it should be noted that for the bottlenose dolphin and otter, populations should be increasing.~~**Water, sediment and prey contaminants –** Contaminants are at levels not detrimental to the bottlenose dolphin that use the SAC.			
		The grey seal QI within Cardigan Bay SAC is currently in favourable condition (low confidence). Below are the attributes and targets for each conservation objective.		Grey seal (*Halichoerus grypus*) [1364]	Underwater noise; Injury risk from vessel activities,

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
		Objective 1: The grey seal population that use the SAC is maintained in favourable condition and stable or increasing over the medium and long term: • **Population using the SAC** - Maintain the grey seal population that use the SAC in favourable condition, and stable or increasing in the medium and long term; and • **SAC pup production** – Maintain a stable or increasing grey seal pup production within the SAC in the medium and long term, including at important pupping sites. **Objective 2**: The grey seal population that use the SAC continue to have access to, and be able to utilise habitats necessary to maintain the population in favourable condition: • **Distribution of grey seal pupping sites within the SAC** - Maintain a stable or increasing grey seal pupping distribution across the SAC. Allowing for natural change and variation; • **Accessibility to habitat used by seals** - Grey seal that use the SAC should not be significantly constrained from accessing necessary habitats within or outside of the site; and • **Anthropogenic disturbance** - Grey seal that use the SAC should not be subject to significant anthropogenic disturbance within or outside of the site. **Objective 3**: The grey seal population that use the SAC have high quality habitat and sufficient food supply to support and maintain the population in favourable condition:			Accidental pollution, and Changes in prey.

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
		• **Habitat quality and function** - Maintain the quality and functionality of habitat to support the grey seal population that use the SAC in favourable condition; • **Prey availability** - Maintain the quality, abundance and diversity of prey needed for the grey seal population that use the SAC to remain in favourable condition; and • **Water, sediment and prey contaminants** - Contaminants are at levels not detrimental to the grey seal population using the SAC.			
Pembrokeshire Marine/ Sir Benfro Forol SAC (UK)	86.45	The grey seal QI within Pembrokeshire Marine SAC is currently in favourable condition (medium confidence). Below are the attributes and targets for each conservation objective. **Objective 1**: The grey seal population that use the SAC is maintained in favourable condition and stable or increasing over the medium and long term: • **Population using the SAC** - Maintain the grey seal population that use the SAC in favourable condition, and stable or increasing in the medium and long term; and • **SAC pup production** – Maintain a stable or increasing grey seal pup production within the SAC in the medium and long term, including at important pupping sites. **Objective 2**: The grey seal population that use the SAC continue to have access to, and be able to utilise habitats necessary to maintain the population in favourable condition:	NRW (2025c)	Grey seal (*Halichoerus grypus*) [1364]	Underwater noise; Injury risk from vessel activities, Accidental pollution, and Changes in prey.

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
		• **Distribution of grey seal pupping sites within the SAC** - Maintain a stable or increasing grey seal pupping distribution across the SAC. Allowing for natural change and variation; • **Accessibility to habitat used by seals** - Grey seal that use the SAC should not be significantly constrained from accessing necessary habitats within or outside of the site; and • **Anthropogenic disturbance** - Grey seal that use the SAC should not be subject to significant anthropogenic disturbance within or outside of the site. **Objective 3**: The grey seal population that use the SAC have high quality habitat and sufficient food supply to support and maintain the population in favourable condition: • **Habitat quality and function** - Maintain the quality and functionality of habitat to support the grey seal population that use the SAC in favourable condition; • **Prey availability** - Maintain the quality, abundance and diversity of prey needed for the grey seal population that use the SAC to remain in favourable condition; and • **Water, sediment and prey contaminants** - Contaminants are at levels not detrimental to the grey seal population using the SAC.			
River Boyne and River Blackwater SAC	~~99.86~~123.20	To restore the favourable conservation condition of River Lamprey (*Lampetra fluviatilis*) in River Boyne and River Blackwater SAC, which is defined by the following list of attributes and targets:	NPWS (2021b)	River Lamprey *Lampetra fluviatilis* [1099]	Underwater noise, EMF, and

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
		• **Distribution -** Restore access to all water courses down to first order streams; • **Distribution of larvae -** Not less than 50% of sample sites with suitable habitat positive for larval brook/river lamprey; • **Population structure of larvae -** At least three age/size classes of larval brook/river lamprey present; • **Larval lamprey density in fine sediment -** Mean density of brook/river larval lamprey in sites with suitable habitat more than 5/m²; and • **Extent and distribution of spawning nursery habitat -** No decline in extent and distribution of spawning and nursery beds.			~~Risk of disturbance or displacement~~Accidental pollution
		To restore the favourable conservation condition of Atlantic Salmon (*Salmo salar*) in River Boyne and River Blackwater SAC, which is defined by the following list of attributes and targets: • **Distribution: extent of anadromy -** 100% of river channels down to second order accessible from estuary; • **Adult spawning fish -** Conservation limit (CL) for each system consistently exceeded; • **Salmon fry abundance -** Maintain or exceed 0+ fry mean catchment-wide abundance threshold value. Currently set at 17 salmon fry/5 minutes sampling; • **Out-migrating smolt abundance** - No significant decline;		Salmon *Salmo salar* [1106]	Underwater noise, EMF, and ~~Risk of disturbance or displacement~~Accidental pollution

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
		• **Number and distribution of redds -** No decline in number and distribution of spawning redds due to anthropogenic causes; and • **Water quality -** At least Q4 at all sites sampled by Environmental Protection Agency (EPA).			
Hook Head SAC	~~109.9~~112.61	To maintain the favourable conservation condition of harbour porpoise in Hook Head SAC, which is defined by the following list of attributes and targets: • **Access to suitable habitat** - Species range within the site should not be restricted by artificial barriers to site use; and • ~~No conservation objectives available for this feature at this time. Assessment will be based upon the COs of the closest designated site with the same qualifying feature that has COs, within the same population community (MU).~~ **Disturbance** - Human activities should occur at levels that do not adversely affect the harbour porpoise community at the site.	~~N/A~~NPWS (2025c)	Harbour porpoise (*Phocoena phocoena* ~~[1351]~~)	Underwater noise, ~~Underwater noise from UXO clearance,~~ ~~Underwater noise~~Injury risk from ~~other~~vessel activities, ~~Collision Risk,~~ Accidental pollution, EMF, and Changes in prey.
		To maintain the favourable conservation condition of bottlenose dolphin in Hook Head SAC, which is defined by the following list of attributes and targets: • **Access to suitable habitat** - Species range within the site should not be restricted by artificial barriers to site use; • ~~No conservation objectives available for this feature at this time. Assessment will be based upon the COs of the closest designated site with the same qualifying feature that has COs, within the same population community (MU).~~		Bottlenose dolphin (*Tursiops truncatus*) [1349]	Underwater noise, ~~Underwater noise from UXO clearance,~~ ~~Underwater noise~~Injury risk from ~~other~~vessel activities, ~~Collision Risk,~~ Accidental pollution,

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
		Disturbance - Human activities should occur at levels that do not adversely affect the bottlenose dolphin population at the site).			EMF, and Changes in prey.
~~Bristol~~North Channel ~~Approaches / Dynesfeydd Môr Hafren~~ SAC (UK)	~~214.68~~142.32	To ensure that the integrity of the site is maintained and that it makes the best possible contribution to maintaining ~~Favourable Conservation Status (~~FCS~~)~~ for harbour porpoise in UK waters: • **harbour porpoise is a viable component of the site -** The intent of this objective is to minimise the risk of injury and killing or other factors that could restrict the survivability and reproductive potential of harbour porpoise using the site; • **There is no significant disturbance of the species** - Operations within or affecting the site should be managed to ensure that the animals' potential usage of the site is maintained; and • **The condition of supporting habitats and processes, and the availability of prey is maintained -** The maintenance of supporting habitats and processes contributes to ensuring that prey is maintained within the site and is available to harbour porpoises using the site.	~~(~~JNCC~~,~~ ~~2019a~~ (2019b)	Harbour porpoise (*Phocoena phocoena*) [1351]	Underwater noise~~,~~ ~~Underwater noise from UXO clearance,~~ ~~Underwater noise~~Injury risk from ~~other~~vessel activities, ~~Collision Risk,~~ Accidental pollution, EMF, and Changes in prey.
~~North~~Bristol Channel Approaches / Dynesfeydd Môr Hafren SAC (UK)	~~194.53~~214.68	To ensure that the integrity of the site is maintained and that it makes the best possible contribution to maintaining ~~Favourable Conservation Status (~~FCS~~)~~ for harbour porpoise in UK waters: • harbour porpoise is a viable component of the site - The intent of this objective is to minimise the risk of injury and killing or other factors that could	~~(~~JNCC~~,~~ ~~2019b~~ (2019a)	Harbour porpoise (*Phocoena phocoena*) [1351]	Underwater noise, ~~Underwater noise from UXO clearance,~~ ~~Underwater noise~~Injury risk from ~~other~~vessel activities,

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
		restrict the survivability and reproductive potential of harbour porpoise using the site; • There is no significant disturbance of the species - Operations within or affecting the site should be managed to ensure that the animals' potential usage of the site is maintained; and • The condition of supporting habitats and processes, and the availability of prey is maintained - The maintenance of supporting habitats and processes contributes to ensuring that prey is maintained within the site and is available to harbour porpoises using the site.			~~Collision Risk,~~ Accidental pollution, EMF, and Changes in prey.
Roaringwater Bay and Islands SAC	~~310.71~~317.71	To maintain the favourable conservation condition of harbour porpoise in Roaringwater Bay and Islands SAC, which is defined by the following list of attributes and targets: • **Access to suitable habitat** - Species range within the site should not be restricted by artificial barriers to site use; and • **Disturbance** - Human activities should occur at levels that do not adversely affect the harbour porpoise community at the site.	~~(~~NPWS~~,~~ (2011d)	Harbour porpoise (*Phocoena phocoena*) [1351]	Underwater noise, ~~Underwater noise from UXO clearance,~~ ~~Underwater noise~~Injury risk from ~~other~~vessel activities, ~~Collision Risk,~~ Accidental pollution, EMF, and Changes in prey.
~~Blasket Islands~~Kenmare River SAC	~~425.35~~374.43	To maintain the favourable conservation condition of harbour porpoise in ~~Blasket Islands~~Kenmare River SAC, which is defined by the following list of attributes and targets:	~~(~~NPWS~~,~~ ~~2014a~~ (2026a)	Harbour porpoise (*Phocoena phocoena*) [1351]	Underwater noise,

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
		• **Access to suitable habitat** - Species range within the site should not be restricted by artificial barriers to site use; and • **Disturbance** - Human activities should occur at levels that do not adversely affect the harbour porpoise community at the site.			~~Underwater noise from UXO clearance,~~ ~~Underwater noise~~Injury risk from ~~other~~vessel activities, ~~Collision Risk,~~ Accidental pollution, EMF, and Changes in prey.
~~Kenmare River~~Blasket Islands SAC	~~371.44~~428.43	To maintain the favourable conservation condition of harbour porpoise in Blasket Islands SAC, which is defined by the following list of attributes and targets: • **Access to suitable habitat** – Species range within the site should not be restricted by artificial barriers to site use; and • ~~No conservation objectives available for this feature at this time. Assessment will be based upon the COs of the closest designated site with the same qualifying feature that has COs, within the same population community (MU).~~ **Disturbance** – Human activities should occur at levels that do not adversely affect the harbour porpoise community at the site.	~~N/A~~NPWS (2014)	Harbour porpoise (*Phocoena phocoena*) [1351]	Underwater noise, ~~Underwater noise from UXO clearance,~~ ~~Underwater noise~~Injury risk from ~~other~~vessel activities, ~~Collision Risk,~~ Accidental pollution, EMF, and Changes in prey.
~~Nord Bretagne DH~~Belgica Mound	~~487.83~~468.39	~~As the site specific conservation objectives (SSCOs) for this site are unavailable, it is assumed that the COs are similar to other UK sites with the same QIs, for example, North Anglesey Marine / Gogledd Môn~~	NPWS, (2025d)	Harbour porpoise (*Phocoena phocoena*) [1351]	Underwater noise,

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
Province SAC ~~(FR)~~		~~Forol SAC and West Wales Marine/ Gorllewin Cymru Forol. The overall SSCO is as follows: **To ensure that the integrity of the site is maintained and that it makes the best possible contribution to maintaining Favourable Conservation Status (FCS) for harbour porpoise in EU waters.**~~ To maintain the favourable conservation condition of harbour porpoise in Belgica Mound Province SAC, which is defined by the following list of attributes and targets: • **Access to suitable habitat** - Species range within the site should not be restricted by artificial barriers to site use; and • **Disturbance** - Human activities should occur at levels that do not adversely affect the harbour porpoise community at the site.			~~Underwater noise from UXO clearance,~~ ~~Underwater noise~~Injury risk from ~~other~~vessel activities, ~~Collision Risk,~~ Accidental pollution, EMF, and Changes in prey.
~~Récifs et landes de la Hague~~Abers - Côtes des legends (FR) ~~SAC~~	~~591.00~~486.66	~~As SSCOs for this site are unavailable, it is assumed that the COs are similar to other UK sites with the same QIs, for example, North Anglesey Marine / Gogledd Môn Forol SAC and West Wales Marine/ Gorllewin Cymru Forol. The overall SSCO is as follows: **To ensure that the integrity of the site is maintained and that it makes the best possible contribution to maintaining Favourable Conservation Status (FCS) for harbour porpoise in EU waters.**~~ In the absence of published site-specific COs for harbour porpoise, the integrity of this transboundary site in respect of this QI is considered to be maintained where harbour porpoise can continue to use the site as suitable habitat, without significant disturbance, and where the conditions supporting site	European Environment Agency (EEA; 2025a)	Harbour porpoise (*Phocoena phocoena*) [1351]	Underwater noise, ~~Underwater noise from UXO clearance,~~ ~~Underwater noise~~Injury risk from ~~other~~vessel activities, ~~Collision Risk,~~ Accidental pollution, EMF, and Changes in prey.

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
		use, including prey availability and supporting processes, remain in an appropriate condition. Further detail on the rationale for this approach is provided within the transboundary sites assessment in Section 6.4.24.			
~~Cote de Granit Rose-Sept Iles SAC~~Nord Bretagne DH (FR)	~~509.47~~491.28	~~As SSCOs for this site are unavailable, it is assumed that the COs are similar to other UK sites with the same QIs, for example, North Anglesey Marine / Gogledd Môn-Forol SAC and West Wales Marine/ Gorllewin Cymru Forol. The overall SSCO is as follows: **To ensure that the integrity of the site is maintained and that it makes the best possible contribution to maintaining Favourable Conservation Status (FCS) for harbour porpoise in EU waters.**~~ In the absence of published site-specific COs for harbour porpoise, the integrity of this transboundary site in respect of this QI is considered to be maintained where harbour porpoise can continue to use the site as suitable habitat, without significant disturbance, and where the conditions supporting site use, including prey availability and supporting processes, remain in an appropriate condition. Further detail on the rationale for this approach is provided within the transboundary sites assessment in Section 6.4.24.	EEA (2025b)	Harbour porpoise (*Phocoena phocoena*) [1351]	Underwater noise, ~~Underwater noise from UXO clearance,~~ ~~Underwater noise~~Injury risk from ~~other~~vessel activities, ~~Collision Risk,~~ Accidental pollution, EMF, and Changes in prey.
~~Anse~~Baie de ~~Vauville~~Morlaix (FR) ~~SAC~~	~~591.23~~505.46	~~As SSCOs for this site are unavailable, it is assumed that the COs are similar to other UK sites with the same QIs, for example, North Anglesey Marine / Gogledd Môn-Forol SAC and West Wales Marine/ Gorllewin Cymru Forol. The overall SSCO is as~~	EEA (2025c)	Harbour porpoise (*Phocoena phocoena*) [1351]	Underwater noise, ~~Underwater noise from UXO clearance,~~

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
		~~follows: **To ensure that the integrity of the site is maintained and that it makes the best possible contribution to maintaining Favourable Conservation Status (FCS) for harbour porpoise in EU waters.**~~ In the absence of published site-specific COs for harbour porpoise, the integrity of this transboundary site in respect of this QI is considered to be maintained where harbour porpoise can continue to use the site as suitable habitat, without significant disturbance, and where the conditions supporting site use, including prey availability and supporting processes, remain in an appropriate condition. Further detail on the rationale for this approach is provided within the transboundary sites assessment in Section 6.4.24.			~~Underwater noise~~Injury risk from ~~other~~vessel activities, ~~Collision Risk,~~ Accidental pollution, EMF, and Changes in prey.
~~Mers Celtiques - Talus du golfe de Gascogne~~Ouessant-Molène (FR)~~ SAC~~	~~610.35~~505.71	~~As SSCOs for this site are unavailable, it is assumed that the COs are similar to other UK sites with the same QIs, for example, North Anglesey Marine / Gogledd Môn Forol SAC and West Wales Marine/ Gorllewin Cymru Forol. The overall SSCO is as follows: **To ensure that the integrity of the site is maintained and that it makes the best possible contribution to maintaining Favourable Conservation Status (FCS) for harbour porpoise in EU waters.**~~ In the absence of published site-specific COs for harbour porpoise, the integrity of this transboundary site in respect of this QI is considered to be maintained where harbour porpoise can continue to use the site as suitable habitat, without significant disturbance, and where the conditions supporting site	EEA (2025d)	Harbour porpoise (*Phocoena phocoena*) [1351]	Underwater noise, ~~Underwater noise from UXO clearance,~~ ~~Underwater noise~~Injury risk from ~~other~~vessel activities, ~~Collision Risk,~~ Accidental pollution, EMF, and Changes in prey.

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
		use, including prey availability and supporting processes, remain in an appropriate condition. Further detail on the rationale for this approach is provided within the transboundary sites assessment in Section 6.4.24.			
~~Tregor Goële~~Côte de Granit rose-Sept Iles (FR) ~~SAC~~	~~541.79~~509.43	~~As SSCOs for this site are unavailable, it is assumed that the COs are similar to other UK sites with the same QIs, for example, North Anglesey Marine / Gogledd Môn Forol SAC and West Wales Marine/ Gorllewin Cymru Forol. The overall SSCO is as follows: **To ensure that the integrity of the site is maintained and that it makes the best possible contribution to maintaining Favourable Conservation Status (FCS) for harbour porpoise in EU waters.**~~ In the absence of published site-specific COs for harbour porpoise, the integrity of this transboundary site in respect of this QI is considered to be maintained where harbour porpoise can continue to use the site as suitable habitat, without significant disturbance, and where the conditions supporting site use, including prey availability and supporting processes, remain in an appropriate condition. Further detail on the rationale for this approach is provided within the transboundary sites assessment in Section 6.4.24.	EEA (2025e)	Harbour porpoise (*Phocoena phocoena*) [1351]	Underwater noise, ~~Underwater noise from UXO clearance,~~ ~~Underwater noise~~Injury risk from ~~other~~vessel activities, ~~Collision Risk,~~ Accidental pollution, EMF, and Changes in prey.
~~Banc et récifs~~Côtes de ~~Surtainville~~Crozon (FR) ~~SAC~~	~~597.06~~530.88	~~As SSCOs for this site are unavailable, it is assumed that the COs are similar to other UK sites with the same QIs, for example, North Anglesey Marine / Gogledd Môn Forol SAC and West Wales Marine/ Gorllewin Cymru Forol. The overall SSCO is as~~	EEA (2025f)	Harbour porpoise (*Phocoena phocoena*) [1351]	Underwater noise, ~~Underwater noise from UXO clearance,~~

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QI's~~QIs)	Potential Impacts Screened In
		~~follows: **To ensure that the integrity of the site is maintained and that it makes the best possible contribution to maintaining Favourable Conservation Status (FCS) for harbour porpoise in EU waters.**~~ In the absence of published site-specific COs for harbour porpoise, the integrity of this transboundary site in respect of this QI is considered to be maintained where harbour porpoise can continue to use the site as suitable habitat, without significant disturbance, and where the conditions supporting site use, including prey availability and supporting processes, remain in an appropriate condition. Further detail on the rationale for this approach is provided within the transboundary sites assessment in Section 6.4.24.			~~Underwater noise~~Injury risk from ~~other~~vessel activities, ~~Collision Risk,~~ Accidental pollution, EMF, and Changes in prey.
~~Baie de Morlaix (FR)~~Bunduff Lough and Machair / Trawalua / Mullaghmore SAC	~~505.31~~537.75	~~As SSCOs for this site are unavailable, it is assumed that the COs are similar to other UK sites with the same QIs, for example, North Anglesey Marine / Gogledd Môn Forol SAC and West Wales Marine/ Gorllewin Cymru Forol. The overall SSCO is as follows: **To ensure that the integrity of the site is maintained and that it makes the best possible contribution to maintaining Favourable Conservation Status (FCS) for harbour porpoise in EU waters.**~~ In the absence of published site-specific COs for harbour porpoise, the integrity of this site in respect of this QI is considered to be maintained where access to suitable habitat within the site is not restricted and where human activities do not adversely affect harbour porpoise using the site,	NPWS (2015)	Harbour porpoise (*Phocoena phocoena*) [1351]	Underwater noise, ~~Underwater noise from UXO clearance,~~ ~~Underwater noise~~Injury risk from ~~other~~vessel activities, ~~Collision Risk,~~ Accidental pollution, EMF, and Changes in prey.

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
		including through effects on the conditions supporting use of the site. Further detail on the rationale for this approach is provided within the site-specific assessment in Section 6.4.13.			
~~Ouessant-Molène~~Chaussée de Sein (FR) ~~SAC~~	~~502.42~~543.15	~~As SSCOs for this site are unavailable, it is assumed that the COs are similar to other UK sites with the same QIs, for example, North Anglesey Marine / Gogledd Môn Forol SAC and West Wales Marine/ Gorllewin Cymru Forol. The overall SSCO is as follows: **To ensure that the integrity of the site is maintained and that it makes the best possible contribution to maintaining Favourable Conservation Status (FCS) for harbour porpoise in EU waters.**~~ In the absence of published site-specific COs for harbour porpoise, the integrity of this transboundary site in respect of this QI is considered to be maintained where harbour porpoise can continue to use the site as suitable habitat, without significant disturbance, and where the conditions supporting site use, including prey availability and supporting processes, remain in an appropriate condition. Further detail on the rationale for this approach is provided within the transboundary sites assessment in Section 6.4.24.	EEA (2025g)	Harbour porpoise (*Phocoena phocoena*) [1351]	Underwater noise, ~~Underwater noise from UXO clearance,~~ ~~Underwater noise~~Injury risk from ~~other~~vessel activities, ~~Collision Risk,~~ Accidental pollution, EMF, and Changes in prey.
~~Belgica Mound Province~~Inishmore Island SAC	~~465.83~~552.21	To maintain the favourable conservation condition of harbour porpoise in Inishmore Island SAC, which is defined by the following list of attributes and targets:	~~N/A~~NPWS (2024d)	Harbour porpoise (*Phocoena phocoena*) [1351]	Underwater noise, ~~Underwater noise from UXO clearance,~~

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
		• **Access to suitable habitat** – Species range should not be restricted by artificial barriers to site use; and • ~~No conservation objectives available for this feature at this time. Assessment will be based upon the COs of the closest designated site with the same qualifying feature that has COs, within the same population community (MU).~~ **Disturbance** – Human activities should occur at levels that do not adversely affect the harbour porpoise community at the site.			~~Underwater noise~~Injury risk from ~~other~~vessel activities, ~~Collision Risk,~~ Accidental pollution, EMF, and Changes in prey.
~~Cap d'Erquy-Cap Fréhel~~Tregor Goëlo (FR) ~~SAC~~	~~594.22~~556.23	~~As SSCOs for this site are unavailable, it is assumed that the COs are similar to other UK sites with the same QIs, for example, North Anglesey Marine / Gogledd Môn Forol SAC and West Wales Marine/ Gorllewin Cymru Forol. The overall SSCO is as follows: **To ensure that the integrity of the site is maintained and that it makes the best possible contribution to maintaining Favourable Conservation Status (FCS) for harbour porpoise in EU waters.**~~ In the absence of published site-specific COs for harbour porpoise, the integrity of this transboundary site in respect of this QI is considered to be maintained where harbour porpoise can continue to use the site as suitable habitat, without significant disturbance, and where the conditions supporting site use, including prey availability and supporting processes, remain in an appropriate condition. Further detail on the rationale for this approach is provided within the transboundary sites assessment in Section 6.4.24.	EEA (2025h)	Harbour porpoise (*Phocoena phocoena*) [1351]	Underwater noise, ~~Underwater noise from UXO clearance,~~ ~~Underwater noise~~Injury risk from ~~other~~vessel activities, ~~Collision Risk,~~ Accidental pollution, EMF, and Changes in prey.

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
~~Chausey (FR)~~Kilkieran Bay and Islands SAC	~~622.23~~565.64	~~As SSCOs for this site are unavailable, it is assumed that the COs are similar to other UK sites with the same QIs, for example, North Anglesey Marine / Gogledd Môn Forol SAC and West Wales Marine/ Gorllewin Cymru Forol. The overall SSCO is as follows: **To ensure that the integrity of the site is maintained and that it makes the best possible contribution to maintaining Favourable Conservation Status (FCS) for harbour porpoise in EU waters.**~~ To maintain the favourable conservation condition of harbour porpoise in Kilkieran Bay and Islands SAC, which is defined by the following list of attributes and targets: • **Access to suitable habitat** - Species range within the site should not be restricted by artificial barriers to site use; and • **Disturbance** - Human activities should occur at levels that do not adversely affect the harbour porpoise community at the site.	NPWS (2026b)	Harbour porpoise (*Phocoena phocoena*) [1351]	Underwater noise, ~~Underwater noise from UXO clearance,~~ ~~Underwater noise~~Injury risk from ~~other~~vessel activities, ~~Collision Risk,~~ Accidental pollution, EMF, and Changes in prey.
~~Abers - Côtes des legends~~Mers Celtiques - Talus du golfe de Gascogne (FR) ~~SAC~~	~~486.66~~573.29	~~As SSCOs for this site are unavailable, it is assumed that the COs are similar to other UK sites with the same QIs, for example, North Anglesey Marine / Gogledd Môn Forol SAC and West Wales Marine/ Gorllewin Cymru Forol. The overall SSCO is as follows: **To ensure that the integrity of the site is maintained and that it makes the best possible contribution to maintaining Favourable Conservation Status (FCS) for harbour porpoise in EU waters.**~~ In the absence of published site-specific COs for harbour porpoise, the integrity of this transboundary	EEA (2025j)	Harbour porpoise (*Phocoena phocoena*) [1351]	Underwater noise, ~~Underwater noise from UXO clearance,~~ ~~Underwater noise~~Injury risk from ~~other~~vessel activities, ~~Collision Risk,~~ Accidental pollution,

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
		site in respect of this QI is considered to be maintained where harbour porpoise can continue to use the site as suitable habitat, without significant disturbance, and where the conditions supporting site use, including prey availability and supporting processes, remain in an appropriate condition. Further detail on the rationale for this approach is provided within the transboundary sites assessment in Section 6.4.24.			EMF, and Changes in prey.
~~Côtes~~Récifs et landes de ~~Crozon~~la Hague (FR) ~~SAC~~	~~531.45~~588.51	~~As SSCOs for this site are unavailable, it is assumed that the COs are similar to other UK sites with the same QIs, for example, North Anglesey Marine / Gogledd Môn Forol SAC and West Wales Marine/ Gorllewin Cymru Forol. The overall SSCO is as follows: **To ensure that the integrity of the site is maintained and that it makes the best possible contribution to maintaining Favourable Conservation Status (FCS) for harbour porpoise in EU waters.**~~ In the absence of published site-specific COs for harbour porpoise, the integrity of this transboundary site in respect of this QI is considered to be maintained where harbour porpoise can continue to use the site as suitable habitat, without significant disturbance, and where the conditions supporting site use, including prey availability and supporting processes, remain in an appropriate condition. Further detail on the rationale for this approach is provided within the transboundary sites assessment in Section 6.4.24.	EEA (2025i)	Harbour porpoise (*Phocoena phocoena*) [1351]	Underwater noise, ~~Underwater noise from UXO clearance,~~ ~~Underwater noise~~Injury risk from ~~other~~vessel activities, ~~Collision Risk,~~ Accidental pollution, EMF, and Changes in prey.

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
Baie de Saint-Brieuc – Est (FR)~~ SAC~~	~~588.78~~589.45	~~As SSCOs for this site are unavailable, it is assumed that the COs are similar to other UK sites with the same QIs, for example, North Anglesey Marine / Gogledd Môn Forol SAC and West Wales Marine/ Gorllewin Cymru Forol. The overall SSCO is as follows: **To ensure that the integrity of the site is maintained and that it makes the best possible contribution to maintaining Favourable Conservation Status (FCS) for harbour porpoise in EU waters.**~~ In the absence of published site-specific COs for harbour porpoise, the integrity of this transboundary site in respect of this QI is considered to be maintained where harbour porpoise can continue to use the site as suitable habitat, without significant disturbance, and where the conditions supporting site use, including prey availability and supporting processes, remain in an appropriate condition. Further detail on the rationale for this approach is provided within the transboundary sites assessment in Section 6.4.24.	EEA (2025k)	Harbour porpoise (*Phocoena phocoena*) [1351]	Underwater noise, ~~Underwater noise from UXO clearance,~~ ~~Underwater noise~~Injury risk from ~~other~~vessel activities, ~~Collision Risk,~~ Accidental pollution, EMF, and Changes in prey.
~~Chaussée~~Anse de ~~Sein~~Vauville (FR)~~ SAC~~	~~543.15~~591.13	~~As SSCOs for this site are unavailable, it is assumed that the COs are similar to other UK sites with the same QIs, for example, North Anglesey Marine / Gogledd Môn Forol SAC and West Wales Marine/ Gorllewin Cymru Forol. The overall SSCO is as follows: **To ensure that the integrity of the site is maintained and that it makes the best possible contribution to maintaining Favourable Conservation Status (FCS) for harbour porpoise in EU waters.**~~	EEA (2025l)	Harbour porpoise (*Phocoena phocoena*) [1351]	Underwater noise, ~~Underwater noise from UXO clearance,~~ ~~Underwater noise~~Injury risk from ~~other~~vessel activities, ~~Collision Risk,~~ Accidental pollution,

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
		In the absence of published site-specific COs for harbour porpoise, the integrity of this transboundary site in respect of this QI is considered to be maintained where harbour porpoise can continue to use the site as suitable habitat, without significant disturbance, and where the conditions supporting site use, including prey availability and supporting processes, remain in an appropriate condition. Further detail on the rationale for this approach is provided within the transboundary sites assessment in Section 6.4.24.			EMF, and Changes in prey.
~~Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard~~Cap d'Erquy-Cap Fréhel (FR) ~~SAC~~	~~612.40~~594.12	~~As SSCOs for this site are unavailable, it is assumed that the COs are similar to other UK sites with the same QIs, for example, North Anglesey Marine / Gogledd Môn Forol SAC and West Wales Marine/ Gorllewin Cymru Forol. The overall SSCO is as follows: **To ensure that the integrity of the site is maintained and that it makes the best possible contribution to maintaining Favourable Conservation Status (FCS) for harbour porpoise in EU waters.**~~ In the absence of published site-specific COs for harbour porpoise, the integrity of this transboundary site in respect of this QI is considered to be maintained where harbour porpoise can continue to use the site as suitable habitat, without significant disturbance, and where the conditions supporting site use, including prey availability and supporting processes, remain in an appropriate condition. Further detail on the rationale for this approach is provided within the transboundary sites assessment in Section 6.4.24.	EEA (2025m)	Harbour porpoise (*Phocoena phocoena*) [1351]	Underwater noise, ~~Underwater noise from UXO clearance,~~ ~~Underwater noise~~Injury risk from ~~other~~vessel activities, ~~Collision Risk,~~ Accidental pollution, EMF, and Changes in prey.

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QI~~sQIs)	Potential Impacts Screened In
~~Baie du Mont Saint-Michel~~Banc et récifs de Surtainville (FR)~~ SAC~~	~~641.16~~596.94	~~As SSCOs for this site are unavailable, it is assumed that the COs are similar to other UK sites with the same QIs, for example, North Anglesey Marine / Gogledd Môn Forol SAC and West Wales Marine/ Gorllewin Cymru Forol. The overall SSCO is as follows: **To ensure that the integrity of the site is maintained and that it makes the best possible contribution to maintaining Favourable Conservation Status (FCS) for harbour porpoise in EU waters.**~~ In the absence of published site-specific COs for harbour porpoise, the integrity of this transboundary site in respect of this QI is considered to be maintained where harbour porpoise can continue to use the site as suitable habitat, without significant disturbance, and where the conditions supporting site use, including prey availability and supporting processes, remain in an appropriate condition. Further detail on the rationale for this approach is provided within the transboundary sites assessment in Section 6.4.24.	EEA (2025n)	Harbour porpoise (*Phocoena phocoena*) [1351]	Underwater noise, ~~Underwater noise from UXO clearance,~~ ~~Underwater noise~~Injury risk from ~~other~~vessel activities, ~~Collision Risk,~~ Accidental pollution, EMF, and Changes in prey.
~~Estuaire de la Rance (FR)~~West Connacht Coast SAC	~~629.00~~608.16	~~As SSCOs for this site are unavailable, it is assumed that the COs are similar to other UK sites with the same QIs, for example, North Anglesey Marine / Gogledd Môn Forol SAC and West Wales Marine/ Gorllewin Cymru Forol. The overall SSCO is as follows: **To ensure that the integrity of the site is maintained and that it makes the best possible contribution to maintaining Favourable Conservation Status (FCS) for harbour porpoise in EU waters.**~~	NPWS (2025e)	Harbour porpoise (*Phocoena phocoena*) [1351]	Underwater noise, ~~Underwater noise from UXO clearance,~~ ~~Underwater noise~~Injury risk from ~~other~~vessel activities, ~~Collision Risk,~~ Accidental pollution,

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
		To maintain the favourable conservation condition of harbour porpoise in West Connacht Coast SAC, which is defined by the following list of attributes and targets: • **Access to suitable habitat** - Species range within the site should not be restricted by artificial barriers to site use; • **Disturbance** - Human activities should occur at levels that do not adversely affect the harbour porpoise community at the site.			EMF, and Changes in prey.
~~Bunduff Lough and Machair / Trawalua / Mullaghmore SAC~~Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard (FR)	~~536.88~~612.40	In the absence of published site-specific COs for harbour porpoise, the integrity of this transboundary site in respect of this QI is considered to be maintained where harbour porpoise can continue to use the site as suitable habitat, without significant disturbance, and where the conditions supporting site use, including prey availability and supporting processes, remain in an appropriate condition. ~~No conservation objectives available for this feature at this time. Assessment will be based upon the COs of the closest designated site with the same qualifying feature that has COs, within the same population community (MU).~~ Further detail on the rationale for this approach is provided within the transboundary sites assessment in Section 6.4.24.	~~N/A~~EEA (2025o)	Harbour porpoise (*Phocoena phocoena*) [1351]	Underwater noise, ~~Underwater noise from UXO clearance,~~ ~~Underwater noise~~Injury risk from ~~other~~vessel activities, ~~Collision Risk,~~ Accidental pollution, EMF, and Changes in prey.
~~Inishmore Island SAC~~ Chausey (FR)	~~549.28~~622.13	In the absence of published site-specific COs for harbour porpoise, the integrity of this transboundary site in respect of this QI is considered to be maintained where harbour porpoise can continue to use the site as suitable habitat, without significant disturbance, and where the conditions supporting site	~~N/A~~EEA (2025p)	Harbour porpoise (*Phocoena phocoena*) [1351]	Underwater noise, ~~Underwater noise from UXO clearance,~~

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
		use, including prey availability and supporting processes, remain in an appropriate condition. ~~No conservation objectives available for this feature at this time. Assessment will be based upon the COs of the closest designated site with the same qualifying feature that has COs, within the same population community (MU).~~ Further detail on the rationale for this approach is provided within the transboundary sites assessment in Section 6.4.24.			~~Underwater noise~~Injury risk from ~~other~~vessel activities, ~~Collision Risk,~~ Accidental pollution, EMF, and Changes in prey.
~~Kilkieran Bay and Islands SAC~~Estuaire de la Rance (FR)	~~562.75~~626.34	In the absence of published site-specific COs for harbour porpoise, the integrity of this transboundary site in respect of this QI is considered to be maintained where harbour porpoise can continue to use the site as suitable habitat, without significant disturbance, and where the conditions supporting site use, including prey availability and supporting processes, remain in an appropriate condition. ~~No conservation objectives available for this feature at this time. Assessment will be based upon the COs of the closest designated site with the same qualifying feature that has COs, within the same population community (MU).~~ Further detail on the rationale for this approach is provided within the transboundary sites assessment in Section 6.4.24.	~~N/A~~EEA (2025q)	Harbour porpoise (*Phocoena phocoena*) [1351]	Underwater noise, ~~Underwater noise from UXO clearance,~~ ~~Underwater noise~~Injury risk from ~~other~~vessel activities, ~~Collision Risk,~~ Accidental pollution, EMF, and Changes in prey.
~~West Connacht Coast SAC~~Baie du Mont Saint-Michel (FR)	~~605.46~~640.84	In the absence of published site-specific COs for harbour porpoise, the integrity of this transboundary site in respect of this QI is considered to be maintained where harbour porpoise can continue to use the site as suitable habitat, without significant disturbance, and where the conditions supporting site	~~N/A~~EEA (2025r)	Harbour porpoise (*Phocoena phocoena*) [1351]	Underwater noise, ~~Underwater noise from UXO clearance,~~

Site Name	Distance of European site from closest point of the Proposed Development (km)	Conservation Objectives	Reference	Qualifying Interests (~~QIs~~QIs)	Potential Impacts Screened In
		use, including prey availability and supporting processes, remain in an appropriate condition. ~~No conservation objectives available for this feature at this time. Assessment will be based upon the COs of the closest designated site with the same qualifying feature that has COs, within the same population community (MU).~~ Further detail on the rationale for this approach is provided within the transboundary sites assessment in Section 6.4.24.			~~Underwater noise~~Injury risk from ~~other~~vessel activities, ~~Collision Risk,~~ Accidental pollution, EMF, and Changes in prey.

5.2 Summary of Stage 1 Screening Assessment for SPAs

5.2.1.1 From the findings of the screening stage appraisal ~~presented ((~~see NIS Volume I~~,~~: Supporting Information for Screening for Appropriate Assessment Report (Revised March 2026)), the possibility of ~~Likely Significant Effects~~LSEs could not be excluded for the following SPAs and their QIs at the screening stage (Table 5.2), in the absence of further evaluation and analysis and/or mitigation measures.

Table 5.2: SPAs and their Special Conservation Interest considered in this NIS where Likely Significant Effect could not be excluded at the screening stage.

Site Name	Distance of European site from the Proposed Development (km)	Conservation Objectives	Qualifying Interest (QI)	Why?	Reference
Wicklow Head SPA	5.3	**To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA:** **The favourable conservation status of a species is achieved when:** • Population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats; • The natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future; and • There is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.	Kittiwake	Risk of collision	NPWS~~. 2022a~~ (2024e) ~~12/10/2022~~10/09/2024
The Murrough SPA	7.8	**To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA:** **The favourable conservation status of a species is achieved when:** • Population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats; • The natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future; and • There is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.	Red-throated diver	Potential re-distribution within the overlapping area of the Array Area's 10 km buffer and the SPA	NPWS (2024f) 08/10/2024
Howth Head Coast SPA	48.6	**To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA:**	Kittiwake	Risk of collision	NPWS~~, 2022b~~ (2024g) ~~12/10/2022~~29/10/2024

Site Name	Distance of European site from the Proposed Development (km)	Conservation Objectives	Qualifying Interest (QI)	Why?	Reference
		The favourable conservation status of a species is achieved when: • Population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats; • The natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future; and • There is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.			
Ireland's Eye SPA	52.8	**To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA:** **The favourable conservation status of a species is achieved when:** • Population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats; • The natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future; and • There is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.	Guillemot	Risk of displacement	NPWS~~, 2022c~~ (2024h) ~~12/10/2022~~12/11/2024
			Herring gull	Risk of collision	
			Kittiwake	Risk of collision	
			Razorbill	Risk of displacement	
Lambay Island SPA	61.6	**To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA:** **The favourable conservation status of a species is achieved when:** • Population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats;	Guillemot	Risk of displacement	NPWS~~, 2022d~~ ~~12/10/2022~~ (2024i) 19/11/2024
			Herring gull	Risk of collision	
			Kittiwake	Risk of collision	
			Lesser black-backed gull	Risk of collision	

Site Name	Distance of European site from the Proposed Development (km)	Conservation Objectives	Qualifying Interest (QI)	Why?	Reference
		• The natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future; and • There is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.	~~Puffin~~Razorbill	Risk of displacement	
			~~Razorbill~~	~~Risk of displacement~~	
Saltee Island SPA	70.4	To maintain the favourable conservation condition of Gannet in the Saltee Islands SPA, which is defined by the following list of attributes and targets: **No significant decline:** • Breeding population abundance: apparently occupied nests (AONs); • Productivity rate; • Distribution: breeding colonies; • Prey biomass available; **No significant increase:** • Barriers to connectivity; • Disturbance at the breeding site; and • Disturbance at marine areas immediately adjacent to the colony.	Gannet	Risk of collision	NPWS~~, 2011c~~ (2011b) 21/10/2011
		To maintain the favourable conservation condition of Guillemot in the Saltee Islands SPA, which is defined by the following list of attributes and targets: **No significant decline:** • Breeding population abundance: individual adult; • Productivity rate; • Distribution: breeding colonies; • Prey biomass available; **No significant increase:**	Guillemot	Risk of displacement	

Site Name	Distance of European site from the Proposed Development (km)	Conservation Objectives	Qualifying Interest (QI)	Why?	Reference
		• Barriers to connectivity; • Disturbance at the breeding site; and • Disturbance at marine areas immediately adjacent to the colony."			
		To maintain the favourable conservation condition of Herring Gull in the Saltee Islands SPA, which is defined by the following list of attributes and targets: **No significant decline:** • Productivity rate; • Distribution: breeding colonies; • Prey biomass available; **No significant increase:** • Productivity rate; and • Distribution: breeding colonies.	Herring gull	Risk of collision	
		To maintain the favourable conservation condition of Kittiwake in the Saltee Islands SPA, which is defined by the following list of attributes and targets: **No significant decline:** • Breeding population abundance: apparently occupied nests (AONs); • Productivity rate; • Distribution: breeding colonies; and • Prey biomass available. **No significant increase:** • Barriers to connectivity; and • Disturbance at the breeding site.	Kittiwake	Risk of collision	

Site Name	Distance of European site from the Proposed Development (km)	Conservation Objectives	Qualifying Interest (QI)	Why?	Reference
		To maintain the favourable conservation condition of Lesser Black-backed Gull in the Saltee Islands SPA, which is defined by the following list of attributes and targets: **No significant decline:** • Breeding population abundance: apparently occupied nests (AONs); • Productivity rate; • Distribution: breeding colonies; and • Prey biomass available. **No significant increase:** • Barriers to connectivity; and • Disturbance at the breeding site.	Lesser black-backed gull	Risk of collision	
		~~To maintain the favourable conservation condition of Puffin in the Saltee Islands SPA, which is defined by the following list of attributes and targets:~~ ~~**No significant decline:**~~ ~~• Breeding population abundance: apparently occupied burrow (AOB);~~ ~~Productivity rate;~~ ~~• Distribution: breeding colonies; and~~ ~~• Prey biomass available.~~ ~~**No significant increase:**~~ ~~• Barriers to connectivity;~~ ~~• Disturbance at the breeding site; and~~ ~~• Disturbance at marine areas immediately adjacent to the colony.~~ ~~**Absent or under control:**~~ ~~• Occurrence of mammalian predators.~~	~~Puffin~~	~~Risk of displacement~~	

Site Name	Distance of European site from the Proposed Development (km)	Conservation Objectives	Qualifying Interest (QI)	Why?	Reference
		To maintain the favourable conservation condition of ~~Puffin~~Razorbill in the Saltee Islands SPA, which is defined by the following list of attributes and targets: **No Significant decline:** • Breeding population abundance: individual adult; • Productivity rate; and • Distribution: breeding colonies. **No significant increase:** • Barriers to connectivity; • Disturbance at the breeding site; and • Disturbance at marine areas immediately adjacent to the colony.	Razorbill	Risk of displacement	
Skerries Island SPA	72	**To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA:** **The favourable conservation status of a species is achieved when:** • Population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats; • The natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future; and • There is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.	Herring gull	Risk of collision	NPWS~~, 2022e~~ (2024j) ~~12/10/2022~~19/11/2024

6 Stage 2 Information to Inform the Assessment Alone

6.1 Baseline information to inform Stage 2 AA for Annex I Coastal and Marine Habitat QIs

6.1.1.1 As outlined in Section 5.1, the following designated sites in Ireland have continued through the Stage 1 Screening Assessment to be assessed in Stage 2, as a ~~likely significant effect~~LSE could not be ruled out. These are presented in Figure 6.1.

- Wicklow Reef SAC – Reef;
- Magherabeg Dunes SAC – Sand dune habitats;
- Buckroney-Brittas Dunes and Fen SAC – Sand dune habitats;
- Kilpatrick Sandhills SAC – Sand dune habitats;
- The Murrough Wetlands SAC – Mediterranean salt meadows, Atlantic salt meadows;
- Cahore Polders and Dunes SAC – Sand dune habitats; and
- Blackwater Bank SAC – Sandbanks which are slightly covered by sea water all the time.

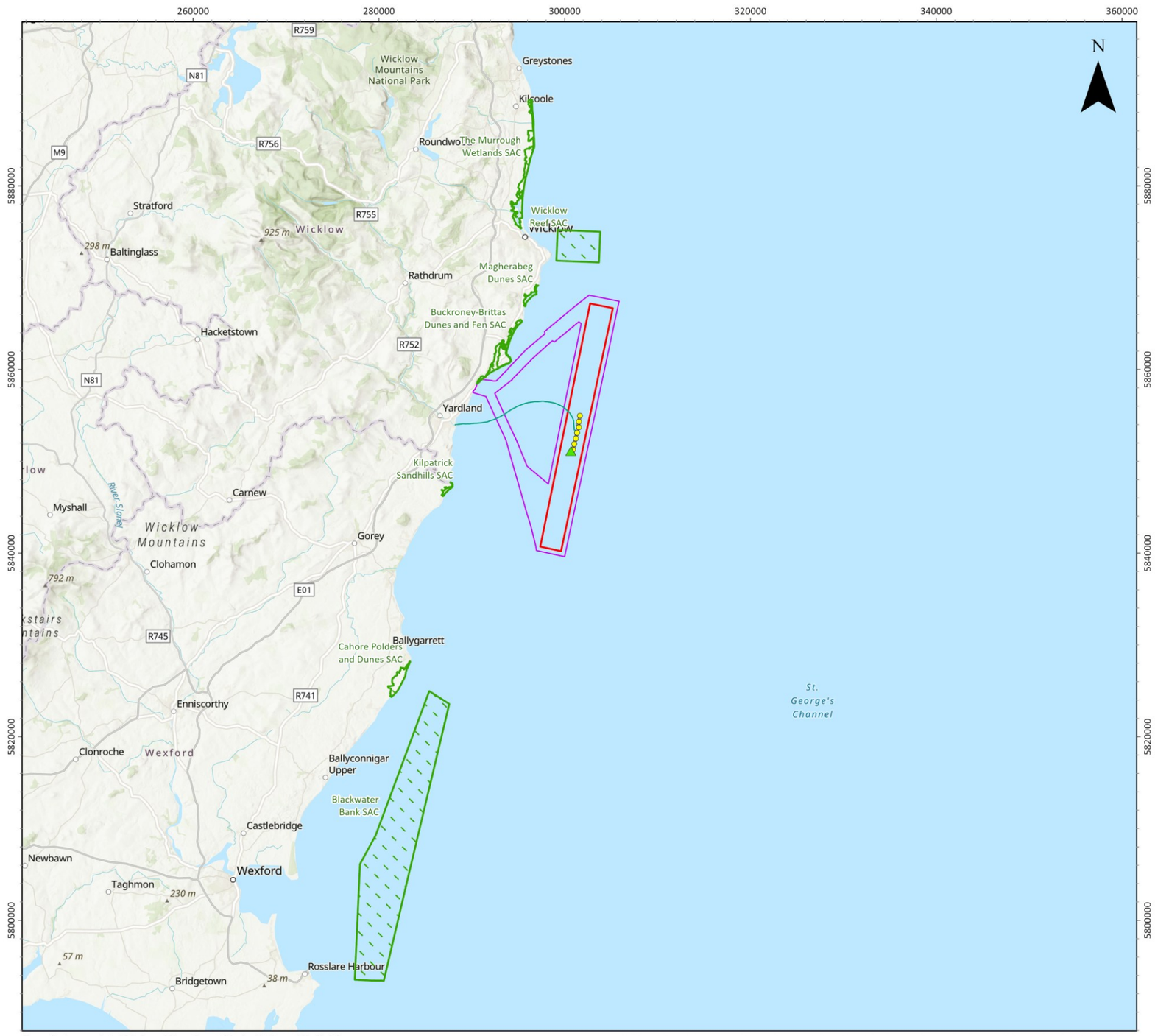
6.1.1.2 The Array Area and Cable Corridor and Working Area do not overlap with any of these designated sites, with the closest site being ~~Wicklow Reef~~Buckroney-Brittas Dunes and Fen SAC at ~~3.61~~0.05 km from the Proposed Development. ~~The Stage 1 SISAA~~NIS Volume I: Supporting Information for Screening for Appropriate Assessment (Revised March 2026) concluded that there was potential for LSE via habitat deterioration and habitat alteration for sand dune habitats, Mediterranean salt meadows, Atlantic salt meadows, reefs and sandbanks which are slightly covered by sea water all the time.

6.1.1.3 Habitat deterioration can result from elevated concentrations of suspended sediment and elevated concentrations of contaminants both arising as a result of construction, operational and maintenance and decommissioning activities.

6.1.1.4 Habitat alteration can result from longer term changes to coastal and physical processes during the operational and maintenance phase, due to the presence of windfarm infrastructure on the seabed, resulting in altered hydromorphological conditions, including potential changes to tidal currents, the local wave climate, sediment transport processes and resulting seabed morphology, for example via interruption of tidal flows, longshore or cross-shore drift patterns or the local wave regime; could potentially affect the COs of any qualifying Annex I marine or coastal habitats (such as reefs or sand dune habitats).

6.1.1.5 ~~6.1.1.4~~ Overall, the following impacts are therefore considered, with consideration of the COs of the ~~qualifying interests~~QIs of these SACs:

- Elevated ~~concentration of suspended sediment from~~SSCs and associated deposition during construction, operational and maintenance ~~activities;~~ and decommissioning phases;
- Accidental pollution ~~from~~during construction, operational and maintenance ~~activities.~~and decommissioning phases; and
- Changes to physical processes due to the presence of infrastructure during operational and maintenance phase.



sse Renewables

Arklow Bank Wind Park 2

Sites Assessed at Stage 2 (AA) for Coastal and Marine Habitats

Legend

- ABWP2 Array Area
- ABWP2 Cable Corridor and Working Area
- ABWP1 WTGs
- ABWP1 Existing Met Mast
- ABWP1 Existing Export Cable
- ABWP1 Array Area
- Special Area of Conservation (SAC)



Notes

Esri UK, Esri, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS, Esri UK, Esri, TomTom, Garmin, FAO, NOAA, USGS, Esri, Ordnance Survey, NASA, NGA, USGS, Esri, GEBCO, Garmin, NaturalVue. Contains Ordnance Survey data © Crown copyright and database rights (2022). OS OpenData.

Coordinate System:
ETRS 1989 UTM Zone 30N

0 8 16 km

0 4 8 nm

Scale	Date	Drawn By	Checked By	Approved By
1:400,000 @ A3	25/04/2024	GB	EM	LK

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Figure Number 6.1

Figure Reference: Ark_001_Stage2Sites_CoastalMarineHabitats_NIS_Fig6.1

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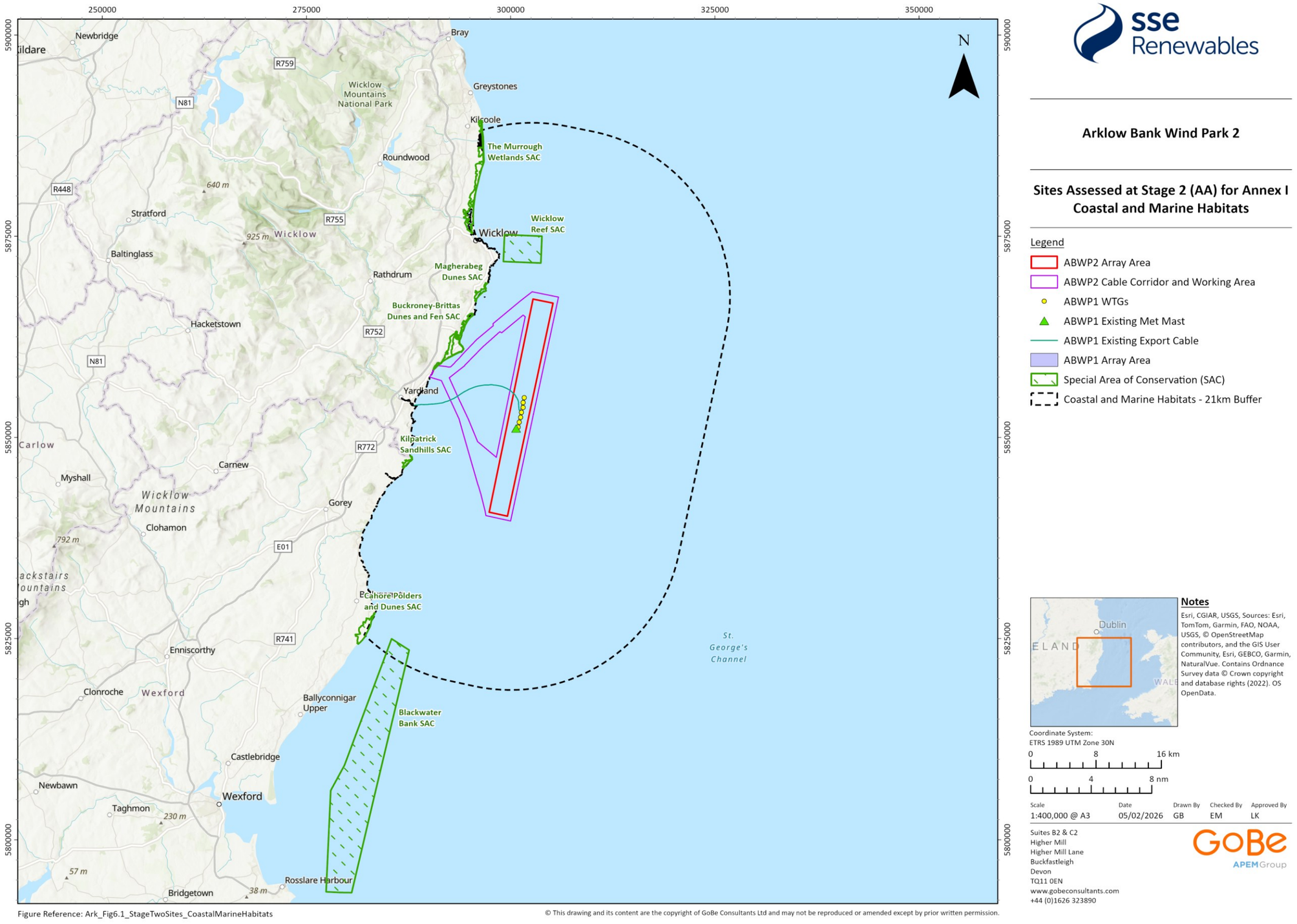


Figure 6.1: Sites assessed at Stage 2 AA for Annex I Coastal and Marine Habitats

6.1.2 Baseline Environment

Site-specific survey summary

6.1.2.1 Several benthic subtidal surveys have been conducted across the Benthic Subtidal and Intertidal Ecology Study Area between 2000 and 2021. These included pre-construction baseline surveys (prior to construction for the ABWP1 WTGs) undertaken in 2000 and 2001, a series of post-construction monitoring surveys undertaken over a period of eight years (2004 to 2011, inclusive) and a subtidal benthic ecology survey, conducted as part of the post-construction monitoring programme for ABWP1 in 2021. These site-specific monitoring surveys were focussed primarily on Arklow Bank and the area inshore, although some sampling was also undertaken to the east of Arklow Bank. In addition, site-specific geophysical surveys for ABWP2 were also undertaken across the Array Area and offshore export cable routes in 2019 and 2022. A further survey was undertaken in 2024 to further characterise benthic communities, sediment characteristics and quality. These data provide further characterisation information, including seabed feature and sediment types, which were considered alongside the ecological datasets.

6.1.2.2 An intertidal Phase I walkover survey and on-site dig-over sediment sampling of the landfall site, located to the south of Ennereilly Beach, was conducted in June 2019. The survey was conducted following guidance outlined in Davies *et al.* (2001) and Wyn *et al.* (2006), while habitats/biotopes were classified in accordance with Connor *et al.* (2004). For the purposes of this report, EUNIS codes have also been provided (EEA, 2019). The results of this survey have provided a robust and up-to date baseline characterisation of the benthic intertidal ecology study area to inform this assessment.

6.1.2.3 A summary of site-specific surveys undertaken to inform the Stage 2 appraisal on coastal and marine habitats is provided in Table 6.1.

Table 6.1: Summary of site-specific surveys undertaken for Annex I Coastal and Marine Habitats.

Data Source	Date(s) of survey	Survey Methodology
EcoServe (2001b) ABWP1 baseline survey	June 2000	Anchor dredge with large net mesh (infauna and PSA) – 21 stations.
	September 2000	Anchor dredge with large net mesh (infauna and PSA) – 19 stations; and Otter trawl (fish and epifauna) – 6 stations.
	April 2001	Anchor dredge with large net mesh (infauna and PSA) – 15 stations; and Agassiz trawl (fish and epifauna) – 3 stations.
HydroServ Projects Ltd. (2004). ABWP1 post-construction survey.	June/July 2004	Day grabs (infauna and PSA); and Beam trawls (epifauna).
HydroServ Projects Ltd (2005). ABWP1 post-construction survey.	October 2004	Anchor dredge with closed metal base (infauna and PSA); and Beam trawl (epifauna).
HydroServ Projects Ltd (2006a). ABWP1 post-construction survey.	June 2005	
HydroServ Projects Ltd (2006b). ABWP1 post-construction survey.	November 2005	
HydroServ Projects Ltd (2007a). ABWP1 post-construction survey.	June 2006	

Data Source	Date(s) of survey	Survey Methodology
HydroServ Projects Ltd (2007b). ABWP1 post-construction survey.	May 2007	
HydroServ Projects Ltd (2009). ABWP1 post-construction survey.	May 2008	
HydroServ Projects Ltd (2010). ABWP1 post-construction survey.	June 2009	
GE Wind Energy (2011). ABWP1 post-construction survey.	June 2010	
GE Wind Energy (2012). ABWP1 post-construction survey.	June 2011	
GE Wind Energy (2021). ABWP1 post-construction survey.	September 2021	
Aquafact International Services Ltd (2008) Proposed Dredge Disposal Sites for Arklow Harbour Commissioner.	June 2007	Divers using corers for benthic infauna, particle size analysis and organic carbon
Atalah *et al.* 2013. Diversity of demersal and megafaunal assemblages inhabiting sandbanks of the Irish Sea.	August 2007	Beam trawls (demersal fish and megafaunal invertebrates).
Aquatic Services Unit (2016). Sediment chemistry sampling to support dredge dumping as sea permit application for ABWP1	May 2016	Van Veen grabs for sediment chemistry.
RPS (2019). ABWP2 Intertidal Phase I walkover survey and on-site dig-over sediment sampling of the Landfall site.	June 2019	Phase I walkover survey and on-site digging
Ultrabeam Ltd. (2019) Site-specific geophysical surveys of the ABWP2 Array Area and offshore export cable routes.	July/August 2019	Multibeam echo sounder, sidescan sonar, sub-bottom profiler and ~~magnetometre~~magnetometer sampling
Green Rebel (2022) Site-specific geophysical and hydrographic surveys of the ABWP2 Array Area and offshore export cable routes.	August to November 2022	Sub-bottom profiler, Ultra High Resolution Survey (UHRS), sidescan sonar and ~~magnetometre~~magnetometer, multi-beam bathymetry and backscatter
AQUAFACT (2025). Arklow Environmental Survey	October 2024	Drop-down video (DDV) surveys and benthic grab sampling to characterise benthic communities, alongside sediment sampling for physicochemical analysis to assess sediment characteristics and quality.

Seabed Sediment

~~6.1.2.4 The results of the latest site-specific survey conducted in 2021 were in line with the findings from previous surveys, indicating that the seabed is predominately sedimentary with little or no fixed hard substrata (GW Wind Energy, 2021). Minor variations were observed in terms of sediment particle size at select locations between the current survey and previous surveys, which is related to the heterogenous nature of sediments across the site. The seabed on Arklow Bank consisted~~

~~of slightly gravelly sand, with coarser gravelly sands characterising the eastern and western parts of the bank. To the north of Arklow Bank, the seabed varied, ranging from sand, gravelly sand and gravel. Seabed to the south of Arklow bank was predominately sandy with areas of gravel and mud.~~

6.1.2.4 Arklow Bank, within the Array Area, consists of a highly mobile upper layer of sandy sediment which ranges from medium to coarse sand (Creane *et al.* 2023). Project specific surveys indicate that sediments are heterogenous, composed of mobile sands, slightly gravelly sands and gravelly sands present on Arklow Bank (Sure Partners Ltd., 2000; Aquatic Services Unit, 2012; 2021). Medium sand is mainly located at upper levels (less than 15 m water depth) with a gravel-sand with gravel fractions located at greater depths. The substratum ranges from sandy shell to gravel to the west, north and south of the bank to coarse shell and gravel and some rock to the east of the bank. The bank itself consists of mainly sand, cobbles with shells and pebbles at the northern end of the bank and fine sand at the southern end. Keegan *et al.,* (1987) describes the seabed around Arklow Bank as having varying proportions of current-swept coarse sediments, consisting of compact sand, gravel, shell and/or cobbles.

6.1.2.5 The surficial seabed sediments within the regional area are characterised by sand and gravel material.

6.1.2.6 ~~6.1.2.5~~ Site-specific geophysical surveys of the Array Area ~~conducted~~ in 2019 ~~indicate a~~identified boulder ~~field near~~fields to the northeast ~~tip~~ of Arklow Bank, sandwaves to the south, and ~~sand habitat~~mobile sandy sediment across the bank itself~~. Very small~~ (Ultrabeam Ltd., 2019). Patches of ~~course sediments were recorded near the central section~~coarse sediment were also observed along the western flank~~. Water depths across Arklow Bank were typically less than 20 m, with the deepest areas in the northeast (up to 43 m) and southeast of the Array Area (up to 35 m).~~ of the central section of Arklow Bank. This observation is in line with site-specific benthic surveys conducted between 2004 and 2011, and in 2021 which found varying proportions of sand, gravelly sand and gravel in the north of Arklow Bank; predominately sand sediment with areas of gravel and mud in to the south; and slightly gravelly sand, with coarser gravelly sands characterising the eastern and western parts of the bank (HydroServ, 2004 to 2009; Aquatic Services Unit, 2010; GE Wind Energy, 2011 to 2012; GE Wind Energy, 2021).

6.1.2.7 ~~6.1.2.6~~ The 2022 site-specific geophysical survey of the Cable Corridor and Working Area found that the distribution of sediment across the cable routes show predominant facies of medium to coarse sands which coincide with the large presence of sandwaves, megaripples and sediment waves on the approach to Arklow Bank. Conversely, finer grained facies types such as sandy mud to clay are visible in troughs between sand wave crests. The water depths gradually increased offshore to a maximum depth of 35 m below Lowest Astronomical Tide (LAT) before decreasing at Arklow Bank.

6.1.2.8 The results of 2021 and 2024 surveys were in line with the findings from previous studies, indicating that the seabed was predominately sedimentary with little or no fixed hard substrata (GEW Wind Energy, 2021; AQUAFACT, 2025). Minor variations were observed in terms of sediment particle size at select locations between the latest surveys and previous surveys, which is related to the heterogenous nature of sediments across the site. The 2021 and 2024 surveys indicated that the seabed on Arklow Bank consisted primarily of sand with variable proportions of coarser material with sand, slightly gravelly sand, gravelly sand and sandy gravel recorded. The eastern and western parts of the bank were characterised by relatively coarse material such as gravelly sands, while sand, gravelly sand and gravel were evident to the north of Arklow bank with predominately sandy sediment recorded to the south.

Subtidal Benthic Ecology

6.1.2.9 ~~6.1.2.7 The~~Benthic subtidal ~~benthic~~ ecology surveys ~~indicated the presence of low diversity communities~~conducted across the study area between 2007 and 2024 recorded over 230 taxa

with little temporal variation. ~~Results of the most recent site-specific survey conducted in 2021 recorded a total of 185 taxa (2,440 individuals) and 238 taxa (6,355 individuals) within beam trawls and anchor dredge samples, respectively. Overall, the number of taxa recorded within beam trawls and anchor dredge samples were in keeping with previous surveys and similar to those identified in surveys between 2007 and 2011.~~However, while communities at individual sites where generally characterised by relatively low diversity the highest number of taxa were recorded in areas of coarser heterogenous sediments.

6.1.2.10 Atalah *et al.* (2013) conducted beam trawls at three locations on Arklow Bank in 2007 (after the construction of ABWP1) and found that benthic communities were typical of those found across the east coast of Ireland. The most abundant taxa recorded included the hermit crab *Pagurus bernhardus*, the common starfish Asterias rubens, the elliptical surf clam *Spisula elliptica*, and the flying crab *Liocarcinus holsatus*.

6.1.2.11 The benthos of the southern Irish Sea was described by Robinson *et al.* (2012) who reported the occurrence of species-rich gravelly plains throughout St George's Channel typically characterised by the biotope '*Mediomastus fragilis, Lumbrineris* spp., and venerid bivalves in circalittoral coarse sand or gravel' (MC3212). Within Blackwater Bank, located to the south of the Proposed Development, the authors recorded communities resembling the biotope 'Infralittoral mobile clean sand with sparse fauna' (MB5231) or '*Nephtys cirrosa* and *Bathyporeia* spp. in infralittoral sand' B5233) biotopes.

6.1.2.12 ~~6.1.2.8 Species diversity was highest within areas of sandy shell, gravel and cobbles in the northwest, southwest and southeast of Arklow Bank and inshore along the proposed offshore export cable route. The communities associated with sandy sediments were extremely species poor in comparison, as would be expected for the more mobile sandy sediments characterising a shallow sandbank.~~The most abundant species recorded during the 2021 survey were found to be broadly similar to the most abundant species in previous surveys. The species typically recorded were the reef-building worms *Sabellaria alveolata* and *Sabellaria spinulosa*; the polychaetes *Spirobranchus lamarcki, Dipolydora coeca,* Serpulidae spp. and *Scoloplos armiger*; the molluscs shiny button clam *Nucula nucleus*, wrinkled rock borer *Hiatella arctica* and white furrow shell *Abra alba*; the crustaceans wart barnacle *Verruca stroemia* and long clawed porcelain crab *Pisidia longicornis*; and the ~~tunicates baked bean ascidian~~ascidians *Dendrodoa grossularia* and *Polycarpa fibrosa*. ~~The assemblages and patterns recorded in the site-specific surveys reflect the desktop data, including observations made by Keegan *et al.* (1987) and more recent mapping by the EUSeaMap and Robinson *et al.* (2012).~~*Spirobranchus* sp. and Serpulidae were also two of the most commonly recorded taxa in 2024, while polychates *Lumbrineris* sp*., Notomatus* sp*., Mediomastus fragilis* and *Glycera sp.*, the mysid shrimp *Gastrosacchus* sp. and the bivalve *Mytilus edulis* were also relatively common.

6.1.2.13 Across the subtidal benthic surveys the most commonly recorded biotopes included:

- '*Moerella* spp. with venerid bivalves in infralittoral gravelly sand' (JNNC Code: SS.SCS.ICS.MoeVen: EUNIS Code: MB3233);
- 'Infralittoral mobile clean sand with sparse fauna' (JNCC code: SS.SSa.IFiSa.IMoSa; EUNIS code: MB5231);
- '*Sertularia cupressina* and *Hydrallmania falcata* on tide-swept sublittoral sand with cobbles or pebbles' (JNCC code: SS.SSa.IFiSa.ScupHyd; EUNIS code: MB5232);
- '*Nephtys cirrosa* and *Bathyporeia* spp. in Atlantic infralittoral sand' (JNCC code: SS.SSA.IFiSa.NcirBat; EUNIS code: MB5233);
- 'Sparse sponges, *Nemertesia* spp. and *Alcyonidium diaphanum* on circalittoral mixed substrata' (JNCC Code: CR.HCR.XFa.SpNemAdia; EUNIS Code: MC1217);
- '*Flustra foliacea* on slightly scoured silty circalittoral rock' (JNCC code: CR.MCR.EcCr.FaAlCr.Flu; EUNIS code MC12241);

- '*Sabellaria spinulosa* on stable circalittoral mixed sediment' (JNCC code: SS.SBR.PoR.SspiMx; EUNIS code: MC2211);
- '*Mediomastus fragilis, Lumbrineris* spp. and venerid bivalves in Atlantic circalittoral coarse sand or gravel' (JNCC code: SS.SCS.CCS.MedLumVen; EUNIS code: MC3212);
- '*Hesionura elongata* and *Microphthalmus similis* with other interstitial polychaetes in Atlantic infralittoral mobile coarse sand' (JNCC code: SS.SCS.ICS.HeloMsim; EUNIS code: MB3234); and
- *Flustra foliacea* and *Hydrallmania falcata* on tide-swept circalittoral mixed sediment' (JNCC code: SS.SMx.CMx.FluHyd; EUNIS code: MC4214).

6.1.2.14 Locations where *Sabellaria* spp. were recorded in 2024 were assessed for their reef potential using best practice guidelines as described by Limpenny *et al.* (2010) and Gubbay (2007). However, abundances were low and the DDV samples indicated no evidence of any *Sabellaria* reef structures that would qualify as Annex I habitat under the Habitats Directive (EC, 2019). Consequently, it can be considered that while *Sabellaria* is locally present with the potential to form reefs, any such structures are likely to be temporary and limited in the face of the inherently dynamic nature of the local environment.

Subtidal Sediment Contaminants

6.1.2.15 ~~6.1.2.9~~ In May 2016, the Aquatic Services Unit (ASU) was commissioned to undertake sediment sampling and chemical analysis of sediments from three locations on Arklow Bank to support a permit application to undertake seabed levelling works along Arklow Bank. The seabed levelling was required to facilitate access for maintenance vessels for the existing ABWP1 WTGs, and the associated disposal of material. Levels of contaminants which included a suite of metals, organochlorines, polychlorinated biphenyls (PCBs), tributylin (TBT), dibutylin (DBT) and polycyclic aromatic hydrocarbons (PAHs) were typically low and below the respective lower Irish Action Levels (AL) (Cronin *et al.*, 2006). The exception being arsenic which was marginally elevated and exceeded the lower Irish Action Level at a single station, although consultation with the Marine Institute confirmed that this was acceptable for the material to be disposed of at sea (Ramboll Environ, 2016).

6.1.2.16 Results from the 2024 site-specific survey reported generally low concentrations of sediment-bound contaminants across the Cable Corridor and Working Area, with no occurrences of contaminants exceeding the lower Irish AL, with the exception of arsenic. Arsenic concentrations at inshore sites were marginally higher than the lower Irish AL, while remaining well below the upper Irish AL. These concentrations are classified as Class 2 (i.e. marginally contaminated) and, taking into account the limited magnitude of exceedance and the observed spatial distribution, are not considered to constitute an environmental risk.

6.1.3 Avoidance through Design and Standard Project Environmental Protection Measures of the Proposed Development

6.1.3.1 The design of the Proposed Development is such that some potential impact can be avoided as seen by applying the design features and management measures relevant to Annex I Coastal and Marine Habitats which are presented in Table 6.2.

Table 6.2: Project design and environmental protection measures relevant to Annex I Coastal and Marine Habitats.

Measure	Justification
Scour protection	In the absence of scour protection, there is potential for scour pits to develop around foundations. This may result in the release of sediment into the water column and a change to seabed habitat in the vicinity of the foundation. Scour protection will be installed as described in EIAR Volume II, Chapter 4: Description of Development (Revised March 2026).
The Developer confirms and commits that it will not carry out any works in respect of the Proposed Development under the planning permission (if granted) at the same time as any activities the subject of the Foreshore Licence for Site Investigations (FS007339)	The Developer was granted a Foreshore Licence (FS007339) for Site Investigations (associated with the Proposed Development) from the Minister for Housing, Local Government and Heritage in May 2022. The Foreshore Licence expires in 2027. The Developer confirms and commits that it will not carry out any works in respect of the Proposed Development under the planning permission (if granted) at the same time as any activities the subject of the Foreshore Licence for Site Investigations (FS007339) being carried out. As such there is no temporal overlap between the activities consented in this Foreshore Licence and the Proposed Development and there will be no potential for cumulative effects.
The Developer confirms and commits that it will not carry out any works in respect of the Proposed Development under the planning Permission (if granted) at the same time as any activities the subject of the Foreshore Licence Application for Site Surveys (FS007555 ~~(should~~) are being carried out.~~a licence be granted) are being carried~~	The Developer submitted a Foreshore Licence Application for Site Surveys to the Minister for Housing, Local Government and Heritage in April 2023 (FS007555) and this application ~~is pending determination~~This application was determined and granted on 04 July 2024 and is valid until 04 June 2029. The Developer confirms and commits that it will not carry out any works in respect of the Proposed Development under the planning permission (if granted) at the same time as any activities the subject of the Foreshore Licence Application for Site Surveys FS007555 ~~(should a licence be granted)~~ are being carried out. As such there is no temporal overlap between the activities proposed in the Foreshore Licence Application and the Proposed Development.
Impact avoidance/ reduction through design and engineering for Construction and Operational and Maintenance activities as detailed in NIS Volume I: Supporting Information for Screening for Appropriate Assessment Report (Revised March 2026)	The construction activities including cable plans, techniques and burial depths are further detailed in EIAR Volume II, Chapter 4: Description of Development (Revised March 2026). Operational and maintenance activities are also set out in EIAR Volume II, Chapter 4: Description of Development (Revised March 2026).
Impact avoidance/ reduction through Development of and adherence to a Rehabilitation Schedule (NIS Volume III, Appendix 4.1: Rehabilitation Schedule).	The Rehabilitation Schedule outlines the measures associated with the decommissioning of the Proposed Development and Rehabilitation of the area which includes measures to reduce the risk of impact on coastal and marine habitats (NIS Volume III, Appendix 4.1: Rehabilitation Schedule).

Measure	Justification
Impact avoidance/ reduction through Development of and implementation of an Environmental Management Plan (EMP) (NIS Volume III, Appendix 25.1~~, Annex 2~~: Environmental Management Plan (Revised March 2026)) and Marine Pollution Contingency Plan (MPCP) (NIS Volume III, Appendix 25.1: Environmental Management Plan (Revised March 2026), Annex 2).	Ensures plans are in place to manage any marine pollution spills and including key emergency contact details.
Impact avoidance/ reduction through a Confirmatory Survey to be undertaken within the Array Area, Cable Corridor and Working Area to verify the presence/ absence of any areas of reef habitat and seed mussel beds.	Confirmatory surveys will include a geophysical survey carried out prior to construction which will confirm the location and extent of any potential areas of Annex I *Sabellaria* reef habitat which will then be ground truthed via underwater video (i.e. ROV). Any areas of Annex I *Sabellaria* reef habitat identified will be avoided via micro-routing and micro-siting of infrastructure. In addition, the presence of Annex I bedrock or stony reef and blue mussel beds will be identified and avoided via micro-routing and micro-siting.
Impact avoidance/ reduction through an Invasive Non-Indigenous Species Management Plan being implemented. (NIS Volume III, Appendix 25.4: Invasive Non-Indigenous Species Management Plan, Annex IV).	The plan outlines measures to ensure vessels comply with the International Maritime Organisation (IMO) ballast water management guidelines, it will consider the origin of vessels and contain standard housekeeping measures for such vessels as well as measures to be adopted in the event that a high alert species is recorded.
Impact avoidance/ reduction through Environmental Monitoring Measures which are set out in ~~SISAA~~NIS Volume I: Supporting Information for Screening for Appropriate Assessment (Revised March 2026), Section:4 Tables 4.27 to 4.33.	EIAR Volume II, Chapter 25: Summary of Factored in Measures, Mitigation and Monitoring (Revised March 2026) sets out commitments to environmental monitoring in pre-, during and post-construction phases.
Impact avoidance/ reduction through post-installation cable burial surveys and periodic monitoring of cables.	Post-construction surveys to monitor the impacts of cable burial and cable protection on benthic ecology receptors to ensure that the cables do not move or require maintenance. If surveys determine that there is a fault or issue with the cables, maintenance will be carried out to ensure that the cables do not have an adverse impact on benthic ecology. Operational and maintenance asset monitoring commitments include survey of seabed and assets every six months for the first two years and annually thereafter (EIAR Volume II, Chapter 4: Description of Development (Revised March 2026)).

6.1.4 Impacts and Parameters Assessed

6.1.4.1 The Proposed Development has the potential to result in AEoI on Annex I Coastal and Marine Habitats that are QIs for screened in European Sites and seen in Table 6.3.

Table 6.3: Project Design Options 1 and 2 considered for the assessment of potential impacts on Annex I Coastal and Marine Habitats.

Potential impact	Phase			Project Design Option Assessed (1 and 2)	Parameter Differences Between Project Design Option 1 and 2 (if any)
	C	O	D		
Elevated levels ~~suspended sediment concentrations~~of SSCs and associated sediment deposition	✓	✓	✓	Project Design Option 1 **Construction phase:** Confirmatory surveys: • A suite of site (Array Area, Cable Corridor and Working Area) investigations will be undertaken to confirm ~~on~~ the seabed and geological conditions prior to the installation of the infrastructure. Complete details of the full suite of surveys proposed are provided in Section 4 of Volume I, Supporting Information for Screening for Appropriate Assessment Report (Revised March 2026). Those which are relevant to Increased ~~suspended sediment concentrations~~SSCs and associated deposition are: Geotechnical survey: • Boreholes (131 samples); • Cone Penetration Test (CPT) (431 samples); • Vibrocore/ gravity core (300 samples); and • Grab samples (240 samples). Metocean survey: • Floating Light Detection and Ranging (LiDAR) (includes seabed anchor points); • Acoustic Doppler Current Profiler (ADCP) (deployed on a seabed frame and includes mooring structure); and • Wave buoy (includes seabed mooring). Sediment dynamics survey: • Benthic flume; and • Benthic lander (ballasted structure which requires no mooring/ anchor).	Sediment disturbance arising from construction activities (e.g. site preparation, foundation installation (WTG and OSP) and cable installation (including trenchless techniques such as HDD)) may result in indirect impacts on benthic subtidal and intertidal communities as a result of temporary increases in ~~suspended sediment concentrations (~~SSCs~~)~~ and associated sediment deposition (i.e. smothering effects). Despite a larger number of WTGs required for Project Design Option 1 there is only anticipated to be a minimal difference in SSCs, therefore Project Design Option 1 ~~and~~is considered representative of Project Design Option 2 ~~are anticipated to have the same~~ in respect of the potential for elevated levels of ~~suspended sediment concentrations~~SSCs and associated sediment deposition. Within the operational and ~~Management~~maintenance phase, both Project Design Option 1 and 2 have the same level of potential impact. Therefore, Project Design Option 1 is considered representative of Project Design Option 2 in respect of the potential for elevated SSCs and associated deposition. Sediment disturbance arising from decommissioning activities (e.g., removal of structures above the seabed) may result in indirect impacts on benthic subtidal and intertidal communities as a result of temporary increases in SSCs and associated sediment deposition (i.e.

Potential impact	Phase C O D	Project Design Option Assessed (1 and 2)	Parameter Differences Between Project Design Option 1 and 2 (if any)
		Site preparation: Site preparation activities prior to inter-array, interconnector, and offshore export cable installation to include sandwave clearance: • For inter-array cables, ~~sandwaves will be cleared~~sandwave clearance along a width of 70 m, to a depth of 10 m, along 30% of the inter-array cables length, a total volume of 1,000,000 m^3. • For export cables, ~~sandwaves will be cleared~~sandwave clearance along a width of 70 m, to a depth of 10 m, along 30% of the export cables length, a total volume of 500,000 m^3. • For OSP interconnector, sandwaves ~~will be cleared~~clearance along a width of 70 m, to a depth of 10 m, along 30% of the OSP interconnector length, a total volume of 500,000 m^3. • For scour protection, ~~sandwaves will be cleared~~sandwave clearance along a diametre of 99 m, to a depth of 10 m, along 50%, a total volume of 1,000,000 m^3. • For OSP/WTG installation, ~~sandwaves will be cleared~~sandwave clearance along a ~~diametre~~diameter of 100 m, to a depth of 5 m, at 20% of locations, a total volume of 139,200 m^3. Sandwave clearance has been modelled at representative locations across the Array Area and Cable Corridor and Working Area. Site preparation activities also include boulder clearance ploughing and picking of 100% of inter-array, export and interconnector cables at a width of 15 m and depth of ~~500~~0.5 mm with a total seabed area of 2,850,000 m^2. <u>Foundation installation:</u> WTGs and OSPs installed on monopile foundations: • Drilled installation of 25 WTG piles 7-11 m in ~~diametre~~diameter at 0.2 – 1.0 m/h to full depth of 37 m. 1 concurrent drilling event with a drilling duration per pile of 88 hours and a total volume of approximately 132,000 m^3 of drill arisings.	smothering effects). However, decommissioning would have a lesser degree of sediment disturbance in comparison to construction, and operational and maintenance phases as scour protection, cables and cable protection will be left *in situ*. Project Design Option 1 ~~and 2 will have the same level of potential impact~~is considered representative of Project Design Option in respect of the potential for elevated SSCs and associated deposition.

Potential impact	Phase C O D	Project Design Option Assessed (1 and 2)	Parameter Differences Between Project Design Option 1 and 2 (if any)
		• Drilled installation of 2 OSP piles 7-14 m in ~~diametre~~diameter at 0.2 – 1.0 m/h to full depth of 45 m. 1 concurrent drilling event with a drilling duration per pile of 88 hours and a total volume of approximately 27,720 m^3 of drill arisings. Modelled at representative locations across the Array Area. Potential refusal of monopiles during construction (where required). Volume of 4.474 m^3 per refusal and a total volume of 22,370 m^3 for a maximum of five refusals. 1,100 m^2 of habitat loss/disturbance during Unexploded Ordnance (UXO) clearance. <u>Cable installation:</u> • For inter-array cables, total length of 110 – 122 km with a seabed disturbance width of 15 m, with a total of 1,830,000 m^2 of seabed disturbance. • For export cable, total length of 35 - 40 km with a seabed disturbance width of 15 m with a total of 600,000 m^2 of seabed disturbance. • For interconnector, total length of 25-28 km with a seabed disturbance width of 15 m with a total of 420,000 m^2 of seabed disturbance. Modelled at representative locations across Array Area and Cable Corridor and Working Area. <u>Landfall works:</u> HDD drilling fluid release. Rate of release: 20 tonnes (per 24 hours)); and Period of release: 4.5 days (initial punch out followed by reaming phase). **Operational and maintenance phase**	

Potential impact	Phase C O D	Project Design Option Assessed (1 and 2)	Parameter Differences Between Project Design Option 1 and 2 (if any)
		Cable repair and maintenance: Operational dredging of inter-array, export and interconnector cables: • For inter-array cables, operational dredging of 300,000 m^3 every five years; • For export cable and interconnector cables, operational dredging of 100,000 m^3 every five years; • These activities are anticipated to result in approximately 275,000 m^2 of temporary subtidal habitat loss or disturbance per maintenance campaign. Inter-array, export and interconnector cable repair/reburial activities: • For inter-array cables, repair and reburial of cables between 110 km and 122 km in length over the lifetime of the Proposed Development with disturbance of seabed material from 15 m wide and 1.5 m deep trench (cable repair once every three years and cable re-burial once every three years). • For export cables, repair and reburial of cables between 30 km and 40 km in length over the lifetime of the Proposed Development with disturbance of seabed material from 15 m wide and 2.5 m deep trench (cable repair once every five years and cable re-burial once every five years). • Interconnector cables: repair and reburial of cables of between 25 km and 28 km in length over the lifetime of the Proposed Development with disturbance of seabed material from 15 m wide and 10 m deep trench (cable repair once every three years and cable re-burial once every three years). Jack-up Vessels: Presence of jack-up vessels during operational and maintenance activities: • Disturbance of 613,200 m^2 of seabed from jack-up barge across ~~construction~~operational and maintenance period. **Decommissioning phase** Piles will be cut 2 m below the seabed and lifted. Scour protection, cables and cable protection would be left *in situ*.	

Potential impact	Phase C O D	Project Design Option Assessed (1 and 2)	Parameter Differences Between Project Design Option 1 and 2 (if any)
		Project Design Option 2 **Construction Phase:** Confirmatory surveys: • A suite of site (Array Area, Cable Corridor and Working Area) investigations will be undertaken to confirm on the seabed and geological conditions prior to the installation of the infrastructure. Complete details of the full suite of surveys proposed are provided in Section 4 of NIS Volume I: Supporting Information for Screening for Appropriate Assessment Report (Revised March 2026), and EIAR Volume II, Chapter 4: Description of Development (Revised March 2026). Those which are relevant to Increased ~~suspended sediment concentrations~~SSCs and associated deposition are: Geotechnical survey: • Boreholes (131 samples); • CPT (431 samples); • Vibrocore/ gravity core (300 samples); and • Grab samples (240 samples). Metocean survey: • Floating LiDAR (includes seabed anchor points); • Acoustic Doppler Current Profiler (ADCP) (deployed on a seabed frame and includes mooring structure); and • Wave buoy (includes seabed mooring). Sediment dynamics survey: • Benthic flume; and • Benthic lander (ballasted structure which requires no mooring/ anchor). Site preparation: Site preparation activities prior to inter-array, interconnector, and offshore export cable installation to include sandwave clearance:	

Potential impact	Phase C O D	Project Design Option Assessed (1 and 2)	Parameter Differences Between Project Design Option 1 and 2 (if any)
		• For inter-array cables, ~~sandwaves will be cleared~~sandwave clearance along a width of 70 m, to a depth of 10 m, along 30% of the inter-array cables length, a total volume of 1,000,000 m^3. • For export cables, ~~sandwaves will be cleared~~sandwave clearance along a width of 70 m, to a depth of 10 m, along 30% of the export cables length, a total volume of 500,000 m^3. • For OSP interconnector, ~~sandwaves will be cleared~~sandwave clearance along a width of 70 m, to a depth of 10 m, along 30% of the OSP interconnector length, a total volume of 500,000 m^3. • For scour protection, ~~sandwaves will be cleared~~sandwave clearance along a ~~diametre~~diameter of 99 m, to a depth of 10 m, along 50%, a total volume of 1,000,000 m^3. • For OSP/WTG installation, ~~sandwaves will be cleared~~sandwave clearance along a ~~diametre~~diameter of 100 m, to a depth of 5 m, at 20% of locations, a total volume of 117,600 m^3. Sandwave clearance has been modelled at representative locations across the Array Area and Cable Corridor and Working Area. Site preparation activities also include boulder clearance ploughing and picking of 100% of inter-array, export and interconnector cables at a width of 15 m and depth of ~~500 Muir Mhòr~~0.5 m, with a total seabed area of 2,850,000 m^2. Foundation installation: WTGs and OSPs installed on monopile foundations: • Drilled installation of 25 WTG piles 7-11 m in ~~diametre~~diameter at 0.2 – 1.0 m/h to full depth of 37 m. 1 concurrent drilling event with a drilling duration per pile of 88 hours and a total of approximately 176,000 m^3 of drill arisings. • Drilled installation of 2 OSP piles 7-14 m in ~~diametre~~diameter at 0.2 – 1.0 m/h to full depth of 45 m. 1 concurrent drilling event with a drilling duration per pile of 88 hours and total volume of approximately 27,720 m^3 of drill arisings. Modelled at representative locations across the Array Area.	

Potential impact	Phase C O D	Project Design Option Assessed (1 and 2)	Parameter Differences Between Project Design Option 1 and 2 (if any)

Potential refusal of monopiles during construction (where required). Volume of 4,474 m^3 per refusal and a total volume of 22,370 m^3 for a maximum of 5 refusals.

Cable installation:

Installation of inter-array, export and interconnector cables:

- For inter-array cables, total length of 110 – 122 km with a seabed disturbance width of 15 m with a total area of 1,830,000 m^2 of seabed disturbance.
- For export cable, total length of 35 - 40 km with a seabed disturbance width of 15 m with a total areas of 600,000 m^2 of seabed disturbance.
- For interconnector, total length of 25-28 km with a seabed disturbance width of 15 m with a total area of 420,000 m^2 of seabed disturbance.

Modelled at representative locations across Array Area and Cable Corridor and Working Area

Operational and maintenance phase

Cable repair and maintenance:

Operational dredging of inter-array, export and interconnector cables:

- For inter-array cables, operational dredging of 300,000 m^3 every five years
- For export cable and interconnector cables, operational dredging of 100,00 m^3 every five years.
- These activities are anticipated to result in approximately 275,000 m^2 of temporary subtidal habitat loss or disturbance per maintenance campaign.

Inter-array, export and interconnector cable repair/reburial activities.

- For inter-array cables, repair and reburial of cables between 110 km and 122 km in length over the lifetime of the Proposed Development with disturbance of seabed material from 15 m wide and 1.5 m deep trench (cable repair and re-burial once every three years).

Potential impact	Phase C	Phase O	Phase D	Project Design Option Assessed (1 and 2)	Parameter Differences Between Project Design Option 1 and 2 (if any)
				• For export cables, repair and reburial of cables between 30 km and 40 km in length over the lifetime of the Proposed Development with disturbance of seabed material from 15 m wide and 2.5 m deep trench (cable repair once every five years and cable re-burial once every five years). • Interconnector cables: repair and reburial of cables of between 25 km and 28 km in length over the lifetime of the Proposed Development with disturbance of seabed material from 15 m wide and 10 m deep trench (cable repair and re-burial once every three years). Jack-up Vessels: Presence of jack-up vessels during operational and maintenance activities: • Disturbance of 613,200 m^2 of seabed from jack-up barge across construction period. **Decommissioning phase** Piles will be cut 2 m below the seabed and lifted. Scour protection, cables and cable protection would be left *in situ*.	
Accidental release of pollutants	✓	✓	✓	Project Design Option 1 **Construction Phase:** Foundation installation: • Installation of ~~56~~53 WTGs and two OSPs within the Array Area. Cable installation: • Installation of inter-array cables between 110 – 122 km in length, OSP interconnector cables between 25 – 28 km in length, and offshore export cables between 35 – 40 km in length. Landfall: • Potential contamination of nearshore/intertidal habitats;	Within the construction phase Project Design Option 1 consists of a larger number of foundations to be installed – ~~58~~55 monopile foundations in total (~~56~~53 for WTGs and 2 for OSPs), whilst Project Design Option 2 comprises of 49 foundations in total (47 for WTGs and 2 for OSPs). Other potential causes for the accidental release of pollutants are present however are the same within both Project Design Options. Therefore, Project Design Option 1 ~~and Option 2~~ will have ~~the same~~a marginally higher potential for accidental ~~release of pollutants for construction~~pollution and is considered conservatively representative of Project Design Option 2.

Potential impact	Phase C O D	Project Design Option Assessed (1 and 2)	Parameter Differences Between Project Design Option 1 and 2 (if any)
		Drilling mud (bentonite) used to facilitate the installation of offshore export cables via trenchless techniques i.e. HDD and Direct Pipe. Vessels: • 66 vessels on site at one time comprised of jack up barges, cargo, support, tug/anchor, cable installation, guard, survey, crew transfer, sandwave clearance and UXO clearance vessels. • 4,150 return trips across construction period and 1,797 return trips per year. • Construction schedule of 24 hours a day, 7 days a week for a period of ~~5~~four years. • 294 helicopter return trips over the construction phase and 118 helicopter return trips per year. **Operational and maintenance phase** Foundations: • Presence of ~~56~~53 WTGs and two OSPs. • Maintenance activities of ~~56~~53 WTGs and two OSPs. Vessels: • 30 vessels on site at one time comprised of crew transfer, jack-up, cable repair, service operations, cable survey and excavator vessels. • 1,359 return trips per year. • 485 helicopter return trips per year. **Decommissioning phase** Foundations: • Decommissioning of ~~56~~53 WTGs and two OSPs Vessels:	Within the operational and ~~Management~~maintenance phase, ~~both~~ Project Design Option 1 ~~and 2 have the same level of potential impact~~will have a marginally higher potential for accidental pollution due to larger number of WTGs and is therefore considered conservatively representative of Project Design Option 2. Within the Decommissioning Phase Project Design Option 1 will result in the deconstruction and removal of all ~~56~~53 WTGs and two OSPs whilst Project Design Option 2 consists of the deconstruction and complete removal of all 47 WTGs and two OSPs. Other potential causes for the accidental release of pollutants are present however are the same within both Project Design Options. Therefore, Project Design Option 1 ~~and Option 2~~ will have ~~the same~~a marginally higher potential for accidental ~~release of pollutants for decommissioning~~pollution and is therefore considered conservatively representative of Project Design Option 2.

- Presen and movement of vessels during the decommissioning phase (NIS Volume III, Appendix 4.1: Rehabilitation Schedule).

Project Design Option 2

Construction phase

Foundation installation:

- Installation of 47 WTGs and two OSPs within the Array Area.

Cable installation:

- Installation of inter-array cables between 110 – 122 km in length, OSP interconnector cables between 25 – 28 km in length, and offshore export cables between 35 – 40 km in length.

Vessels:

- A maximum of 66 vessels on site at one time comprised of jack up barges, cargo, support, tug/anchor, cable installation, guard, survey, crew transfer, sandwave clearance and UXO clearance vessels.
- 4,150 vessel return trips across construction period and 1,797 return trips per year.
- Construction schedule of 24 hours a day, 7 days a week for a period of ~~five~~four years.
- 294 helicopter return trips over the construction phase and 118 helicopter return trips per year.

Operational and maintenance phase

Foundations:

- Presence of 47 WTGs and two OSPs.
- Maintenance activities of 47 WTGs and two OSPs.

Potential impact	Phase C O D	Project Design Option Assessed (1 and 2)	Parameter Differences Between Project Design Option 1 and 2 (if any)
		Vessels: • A maximum of 30 vessels on site at one time comprised of crew transfer, jack-up, cable repair, service operations, cable survey and excavator vessels. • 1,359 return trips per year. • 485 helicopter return trips per year. **Decommissioning phase** Foundations: • Decommissioning of 47 WTGs and two OSPs. Vessels: • Presence and movement of vessels during the decommission phase (NIS Volume III, Appendix 4.1: Rehabilitation Schedule).	
Changes to physical processes	✓	**Operational and maintenance phase** Project Design Option 1 Foundations: • Presence of 53 WTGs with base diameter of 7-11m and individual seabed footprints of 38-96 m^2 per pile, equating to a total seabed footprint of 2,014-5,088 m^2. • Presence of two OSPs with base diameter of 7-14 m and individual seabed footprints of 38-154 m^2 per pile, equating to a total seabed footprint of 76-308 m^2. • For the WTG foundations, presence of 615-4,779 m^2 of scour protection (scour mattresses, rock dumping, artificial fronds, rock bags and/or geotextile sand containers) per pile, equating to a total seabed footprint of 32,595-253,287 m^2. The corresponding scour protection volume is 307-	Within the construction phase Project Design Option 1 consists of a larger number of foundations to be installed – 55 monopile foundations in total (53 for WTGs and 2 for OSPs), whilst Project Design Option 2 comprises of 49 foundations in total (47 for WTGs and 2 for OSPs). Therefore, Project Design Option 1 is considered representative of Project Design Option 2 for assessing potential influences on habitat change in relation to tidal currents, wave climate, sediment transport and seabed morphology.

14,429 m^3 per WTG foundation, equating to a total volume of 16,271-764,737m^3.

- For OSPs, presence of 615-7,543 m^2 of scour protection (scour mattresses, rock dumping, artificial fronds, rock bags and/or geotextile sand containers) per pile, equating to a total seabed footprint of 1,230-15,086 m^2. The corresponding scour protection volume is 307-22,629 m^3 per OSP, equating to a total volume of 614-45,258 m^3.
- Scour protection material type may include scour mattresses, rock dumping, artificial fronds, rock bags and/or geotextile sand containers.

Cables:

- For inter-array cables, total cable protection footprint of 146,400 m^2 and volume of 219,600 m^3.
- For export cables, total cable protection footprint of 64,000 m^2 and volume of 96,000 m^3.
- For export cables, total of cable crossings required, with a total cable crossings footprint of 750-24,000 m^2 and volume of 375-60,000 m^3.
- For interconnector cables, total cable protection footprint of 140,000 m^2 and volume of 252,000 m^3.

Project Design Option 2

Foundations:

- Presence of 47 WTGs with base diameters of 7-11m and individual seabed footprints of 38-96 m^2 per pile, equating to a total seabed footprint of 1,786-4,521 m^2.
- Presence of two OSPs with base diameters of 7-14 m and individual seabed footprints of 38-154 m^2 per pile, equating to a total seabed footprint of 76-308 m^2.
- For the WTG foundations, presence of 615-4,779 m^2 of scour protection (scour mattresses, rock dumping, artificial fronds, rock bags and/or geotextile sand containers) per pile, equating to a total seabed footprint of

Potential impact	Phase C O D	Project Design Option Assessed (1 and 2)	Parameter Differences Between Project Design Option 1 and 2 (if any)
		28,905-224,613 m^2. The corresponding scour protection volume is 307-14,429 m^3 per WTG foundation, equating to a total volume of 14,429-678,163 m^3. • For OSPs, presence of 615-7,543 m^2 of scour protection (scour mattresses, rock dumping, artificial fronds, rock bags and/or geotextile sand containers) per pile, equating to a total seabed footprint of 1,230-15,086 m^2. The corresponding scour protection volume is 307-22,629 m^3 per OSP, equating to a total volume of 614-45,258 m^3. • Scour protection material type may include scour mattresses, rock dumping, artificial fronds, rock bags and/or geotextile sand containers. Cables: • For inter-array cables, total cable protection footprint of 146,400 m^2 and volume of 219,600 m^3. • For export cables, total cable protection footprint of 64,000 m^2 and volume of 96,000 m^3. • For export cables, total of cable crossings required, with a total cable crossings footprint of 750-24,000 m^2 and volume of 375-60,000 m^3. • For interconnector cables, total cable protection footprint of 140,000 m^2 and volume of 252,000 m^3.	

6.2 Assessment of Proposed Development Alone for Annex I Coastal and Marine Habitat QIs

6.2.1 Overview and Supporting Information for the Assessment

6.2.1.1 Increases of suspended sediments and associated sediment deposition are predicted to occur during the construction and decommissioning phases as a result of confirmatory surveys (Table 6.3), installation/removal of the foundations, sand wave clearance activities and installation of inter-array, interconnector and offshore export cables. Increases of suspended sediments and associated sediment deposition are also predicted to occur during the operational and maintenance phase due to inter-array, interconnector and offshore export cable repair and reburial events.

6.2.1.2 Accidental pollution may occur during the construction, operational and maintenance, and decommissioning phases as a result of accidental spills or releases of chemicals or materials from vessels and associated activities.

6.2.1.3 Changes to physical processes (i.e. tidal currents, sediment transport processes and seabed morphology) may occur during the operational and maintenance phase due to the presence of windfarm infrastructure on the seabed.

6.2.1.4 NIS Volume I: Supporting Information for Screening for Appropriate Assessment (Revised March 2026) concluded that further specialist evaluation was required for seven SACs with Marine and Coastal Habitat QIs. This Stage 2 Appropriate Assessment therefore examines the impact pathways identified at screening in greater detail, informed by topic-specific assessments, numerical modelling where relevant, and consideration of factored-in measures.

6.2.1.5 In particular, sediment plume modelling has been used to assess the potential for habitat deterioration arising from increased suspended sediments and sediment deposition, while morphodynamic modelling has been used to assess the potential for habitat alteration arising from changes to hydrodynamics, wave climate, sediment transport and seabed morphology resulting from the presence of windfarm infrastructure.

6.2.1.6 ~~6.2.1.2 The Stage 1 SISAA (Volume I) concluded that in the absence of computational modelling and further specialist evaluation and analysis demonstrating the predicted extent of sediment plumes arising from construction stage activities then the risk of habitat deterioration as a result of interference with the sediment supply could not be excluded for~~This further assessment is required in relation to Wicklow Reef SAC, Magherabeg Dunes SAC, Buckroney-Brittas Dunes and Fen SAC, Kilpatrick Sandhills SAC, The Murrough Wetlands SAC, Cahore Polder and Dunes SAC or Blackwater Bank SAC ~~during the construction and decommissioning phases~~as potential for LSE could not be ruled out at the screening stage.

Coastal Processes Numerical Modelling

~~6.2.1.3 Project Design Options 1 and 2 were applied to the assessment of effect to Annex I habitats, which considered those activities associated with cable and foundation installation which would result the greatest changes in suspended sediment concentrations (SSC) and associated sediment deposition. These activities included sand wave clearance prior to cable and foundation installation, trenching of inter-array, interconnector and offshore export cables and drilling of foundations. Any other installation methods would lead to lower increases in suspended sediments or sediment deposition. A summary of the scenarios which were subject to computational modelling for each of the installation activities are presented in Volume III, Appendix 6.1: Marine Physical Processes Numerical Modelling of the NIS.~~

~~6.2.1.4 Modelling of suspended sediment associated with sandwave clearance in the Array Area show SSC at a maximum of 2,000 mg/l within the first hour. However, after five hours the SSC is less than~~

~~2.5 mg/l. Disposal south of the Array Area initially results in a plume with SSC at a maximum of 2,000 mg/l, which after five hours is reduced down to less than 2.5 mg/l. Suspended sediments will largely be limited to the Array Area and to the area to the north and south of this (i.e. along the dominant tidal axis), with the resultant plume not extending beyond 8 km from the Array Area and Cable Corridor and Working Area under all tidal flow simulations (speeds and direction). For sediment deposition thicknesses between 100 mm and 500 mm are predicted to occur within 1 km of the disturbance event. At 10 km from the disturbance event sediment deposition is predicted to be 2.5 mm and beyond this sediment deposition becomes immeasurable.~~

~~6.2.1.5 Modelling of suspended sediment associated with sandwave clearance along the export cables show SSC at a maximum of 2,000 mg/l within the first hour. However, after four hours the SSC are less than 2.5 mg/l. Disposal south of the Array Area initially results in a plume with SSC at a maximum of 2,000 mg/l, which after five hours is reduced down to less than 5 mg/l. Suspended sediments will largely be limited to the Array Area and to the area to the north and south of this (i.e. along the dominant tidal axis), with the resultant plume not extending beyond 8 km from the Array Area and Cable Corridor and Working Area under all tidal flow simulations (speeds and direction). For sediment deposition, thicknesses up to 250 mm are predicted to occur within 1 km of the disturbance event. At 10 km from the disturbance event sediment deposition is predicted to be 2.5 mm and beyond this sediment deposition becomes immeasurable.~~

OVERVIEW

6.2.1.7 This section is intended to provide an overview of the coastal processes modelling that has been conducted to inform various assessments related to suspended sediment and deposition and changes to coastal processes from the presence of infrastructure. This modelling is summarised here as it has been used to understand potential impacts to the Annex I Coastal and Marine Habitats. The full details including model calibration, methodology and output can be found in detail in the following documents:

- NIS Volume III, Appendix 6.1: Marine Physical Processes Numerical Modelling (Revised March 2026):
    - For the methodology applied to assess the characteristics of sediment plumes and associated changes in bed level from settling of material, including details of model set-up and calibration.
- NIS Volume III: Arklow Bank Sediment Mobility Assessment (RFI March 2026) (Deltares, 2025):
    - For details of the morphodynamic numerical modelling (including model set-up and calibration, as well as and baseline (do-nothing) assessments of sediment mobility) carried out in response to RFI (7e(i)).
- NIS Volume III: Arklow Bank - Quantitative Assessment of the Influence of In-place Infrastructure on the Local Sediment Transport System (RFI March 2026) (Deltares, 2026):
    - For the results of morphodynamic numerical modelling applied to assess the potential changes to the hydrodynamic and sediment transport regime and morphology associated with the Proposed Development.
- EIAR Volume II, Chapter 6: Coastal Processes (Revised March 2026):
    - For full presentation of an assessment of sediment plumes and associated changes in bed level, including results, modelling approach, and conceptual understanding, as well as an assessment of potential changes to the hydrodynamic and sediment transport regime and morphology associated with the Proposed Development.

SEDIMENT PLUME MODELLING

6.2.1.8 Proposed Development construction activities will result in the disturbance of sediments and the consequential release into the water column. In turn, this will give rise to suspended sediment plumes and localised changes in bed levels as the material settles out of suspension. Those construction activities that will result in the greatest seabed sediment disturbance, due to the associated temporal scale, spatial scale and sediment volumes are presented in Table 6.3. These activities are:

- Sandwave clearance for WTG foundations and along the Cable Corridor and Working Area including spoil disposal via a Trailing Suction Hopper Dredger (TSHD);
- Pre-lay cable trenching using Controlled Flow Excavation (CFE) tools at the seabed for cable installation within the Array Area and along the Cable Corridor and Working Area;
- Foundation installation using drilling techniques; and
- Drilling fluid release during HDD, or other trenchless technique, operations.

6.2.1.9 Where monitoring results are available from comparable activities in similar conditions, these have been provided as part of the assessment. As outlined in NIS Volume III, Appendix 6.1: Marine Physical Processes Numerical Modelling (Revised March 2026), this has been supplemented by a suite of project specific numerical modelling simulations with the release events simulated within the numerical model specifically designed to capture the full range of realistic precautionary outcomes in terms of:

- Sediment plume concentrations;
- Sediment plume extent;
- Vertical deposition depth (bed level change); and
- Horizontal extent of deposition (spatial extent (area) of bed level change).

6.2.1.10 The methodology used to characterise sediment plumes and associated bed level changes is described in detail in (NIS Volume III, Appendix 6.1: Marine Physical Processes Numerical Modelling (Revised March 2026)), including the sediment types and source terms modelled for each scenario, supported by site-specific particle size analysis grab-sample results (NIS Volume III, Appendix 9.2: Aquafact Benthic Survey Report 2025 (RFI March 2026)). Detailed information on model set-up, baseline conditions and full model outputs is provided in the modelling report; this section presents a summary of the key results relevant to assessment of Annex I Coastal and Marine Habitats. Further details of the modelling approach adopted are presented in paragraph 6.10.1.6 to paragraph 6.10.1.7 of EIAR Volume II, Chapter 6: Coastal Processes (Revised March 2026).

6.2.1.11 In the following sections, modelling outputs showing sediment plumes and associated deposition with the largest magnitude and spatial extent in relation to the SACs considered for Annex I Coastal and Marine Habitats have been presented in this NIS. These figures illustrate the potential resulting sediment plume and associated deposition in proximity to the relevant SACs. For visualisations of all modelling outputs, the reader is referred to Section 6.10.1 of EIAR Volume II, Chapter 6: Coastal Processes. These results should be considered in the context of ambient background turbidity occurring across the Study Area, as described in Table 6.9 of Volume II, Chapter 6: Coastal Processes. Average values of near-bed turbidity have been identified from acoustic backscatter data and provide a reference point of baseline average (31.7 mg/l) and maximum (74.6 mg/l) near-bed turbidity, which is presented for context in the legend of the relevant visualisations.

SANDWAVE CLEARANCE INCLUDING SPOIL DISPOSAL VIA A TRAILER SUCTION HOPPER DREDGER IN THE ARRAY AREA

6.2.1.12 The sediment volume likely to be removed for seabed levelling within the Array Area (excluding export cables) is up to 2,639,200 m^3 over the entire construction period and is to be excavated

using a TSHD with an assumed hopper volume of 20,000 m³. Whilst the hopper is being filled, overspill is likely to develop a near-surface sediment plume composed primarily of fine sediments. Once each hopper is filled, dredged material (spoil) will be returned to the seabed at a specified disposal site (in accordance with any future Dumping at Sea permit and associated licence conditions) as a relatively sudden release from under the vessel. Five discrete disposal sites have been identified within the boundary of the Array Area (the locations of which are shown in Figure 6.1 of EIAR Volume II, Chapter 6: Coastal Processes (Revised March 2026)).

6.2.1.13 Numerical modelling simulated both overspill during excavation and spoil disposal at representative disposal locations in the central Array Area (Zones 3 and 4) and southeast Array Area (Zone 2). Sediment was released at the water surface during overspill and at approximately 10 m below the surface during disposal. Figures 6.15 to 6.20 of EIAR Volume II, Chapter 6: Coastal Processes (Revised March 2026) present the modelling simulations described below for Zone3, Zone 4 and Zone 2 disposal sites.

6.2.1.14 Modelling of suspended sediment associated with sandwave clearance in the Array Area show that, for one dredging cycle, within the first five hours of sandwave clearance[1], limited concentrations of fine sediment are observed within 5 km of seabed works. These concentrations are generally below 5 mg/l and disperse within a matter of hours.

6.2.1.15 Disposal of the TSHD load at the disposal points in the centre of the Array Area (Zone 3 and Zone 4) initially result in the formation of a plume with maximum concentrations of the order of 2,500 mg/l. The elevated SSC forms a narrow plume extending from the point of disposal, generally between 250 m and 500 m in width (although this can reach up to 1.5 km in certain scenarios) and extending up to 8.5km away. As the plume is advected along the tidal axis, it is simultaneously dispersed, which causes the SSC levels to decrease. Rapid dispersion is evident such that within five hours the concentrations in the plume are below 100 mg/l. Elevated SSC above 1 mg/l (which is considered functionally immeasurable) is not predicted after 15 hours following the initial sandwave clearance. Under all tidal flow simulations (speeds and direction), elevated SSC (i.e. above background concentration) are not shown to disperse outside of the Cable Corridor and Working Area that surrounds the Array Area.

6.2.1.16 For the results from the Zone 2 disposal site, where 50 successive dredging cycles have been modelled, plumes are formed and then disperse with each dredging cycle. Depending on the tidal state, successive plumes may persist for longer periods of time, resulting in localised additive effects, however these will be short-term and expected to disperse within several tidal cycles of the cessation of works. Maximum concentrations of 5,000 mg/l are observed within 1.5 km of the activities, reducing to low hundreds of mg/l within approximately 2 km of the works. Measurable elevated SSC (i.e. above 1 mg/l) is not shown to disperse beyond 9 km from the disposal site, and all measurable SSC is shown to have fully dispersed approximately five days after the conclusion of the works. These results should be considered in the context of ambient background turbidity as outlined in paragraph 6.2.1.11, with baseline average (31.7 mg/l) and maximum (74.6 mg/l) values of near-bed turbidity

6.2.1.17 Modelling of sediment deposition associated with sandwave clearance within the Array Area indicates that current speed strongly influences the spatial extent and thickness of deposited material. Under higher current speeds, deposition is characterised by a greater spatial extent and lower thickness, whereas under lower current speeds deposition is more spatially limited but thicker. This pattern is more pronounced at the Zone 4 disposal site than at Zone 3. Deposition aligns with the predominantly north–south tidal flow axis within the Array Area.

[1] For a release during high current speeds. During lower current speeds, the plumes' SSC remain of similar orders of magnitude, but its extent is reduced as would be expected due to the reduced dispersive energy of the tidal regime.

6.2.1.18 Sediment deposition is greatest in the immediate vicinity of the works, with thicknesses generally between 50 mm and 150 mm, and locally exceeding 200 mm, within approximately 1 km of the installation activities for the Zone 3 and Zone 4 disposal sites. Beyond this distance, deposited thicknesses reduce rapidly to below 35 mm within several kilometres and continue to decrease with distance, such that between approximately 1.5 km (low current scenarios) and 5 km (high current scenarios) from the source, deposition is typically of the order of 1–2.5 mm. Beyond these distances, deposited thicknesses are negligible (<1 mm) under both scenarios.

PRE-LAY INTER-ARRAY CABLE TRENCHING AT THE SEABED

6.2.1.19 Of the pre-lay cable trenching techniques considered for the Proposed Development, the use of CFE tools has been numerically assessed, as they have the greatest potential to disturb and suspend seabed sediment, and therefore represent the most precautionary scenario. Results are presented below for inter-array cable trenching operations at the north and south of the Array Area.

6.2.1.20 As outlined in Table 6.3, CFE trenching would excavate a trench approximately 15 m wide and 1.5 m deep, resulting in a total seabed sediment disturbance area of approximately 1,830,000 m². Trenching is undertaken between foundations, with temporary cessation of works between sections to facilitate cable termination and installation activities. Where weather conditions allow, trenching interruptions of up to approximately 24 hours are anticipated.

6.2.1.21 The temporary (24 hours) break in the trenching activity will allow suspended material to be dispersed/deposited in the absence of seabed disturbance activities. The trenched sediment volume will be forced into suspension to a height of around 3 m above the seabed with the finer material settling within several meters of the trench. Displaced material will not be removed from the sedimentary system, and these small-scale changes in bed levels are likely to be quickly redistributed by the energetic hydrodynamic processes present within the Array Area.

6.2.1.22 Numerical modelling results for CFE operations at the north and south of the Array Area indicate that maximum SSCs occur within the immediate vicinity of the activity, with SSC exceeding 2,000 mg/l within 1 km of the activity in the north of the Array Area. Due to rectilinear tidal flows, elevated SSCs form a narrow plume aligned with the tidal axis. Under high northerly and high southerly current scenarios, SSCs of less than 2.5 mg/l extend up to approximately 17 km north and 9 km south of the trenching activities, respectively. In the south of the Array Area, peak SSCs are lower, generally not exceeding 1,500 mg/l close to the works, and elevated SSCs are not predicted to extend beyond approximately 4 km from the trenching location. These results should be considered in the context of ambient background turbidity as outlined in paragraph 6.2.1.11, with baseline average (31.7 mg/l) and maximum (74.6 mg/l) values of near-bed turbidity.

6.2.1.23 Numerical modelling results for CFE operations in the north and south of the Array Area indicate that sediment is deposited within the SSC's plume. In the north of the Array Area, maximum deposition occurs close to the trenching activities, reaching up to approximately 100 mm. Under high northerly and high southerly current scenarios, deposition is predicted to extend up to approximately 18 km and 10 km, respectively, with thicknesses reducing to ≤2.5 mm at these distances. In the south of the Array Area, maximum deposition thicknesses are higher, reaching up to approximately 215 mm, however it is worth noting that deposition is not predicted to occur beyond approximately 3 km from the trenching activities. Maximum deposition is associated with lower current speed scenarios, where sediment settles more rapidly. Deposited material is expected to be continually reworked through tidal and wave-driven re-suspension and redistribution.

6.2.1.24 See Figure 6.2 and Figure 6.3 for the results of numerical modelling simulations of SSCs and associated sediment deposition undertaken for inter-array cable trenching operations in the north of the Array Area, and for the resulting sediment plume extent in relation to the SACs screened in for Annex I Coastal and Marine Habitats. The results for inter-array cable trenching operations

in the south of the Array Area are presented in EIAR Volume II, Chapter 6: Coastal Processes (Revised March 2026).

FOUNDATION INSTALLATION USING DRILLING TECHNIQUES

6.2.1.25 ~~6.2.1.6 The design scenario for foundation installation assumes the drilled installation of 25 WTG piles 11 m in diametre and 2 OSP piles 14 m in diametre.~~ Numerical modelling (NIS Volume III, Appendix 6.1: Marine Physical Processes Numerical Modelling (Revised March 2026)) has simulated drilling at ~~WTG~~two representative locations; at a WTG location on the western side of Arklow Bank and the southern OSP. The release of drill arisings is simulated to persist for 88 hours (at the WTG), followed by a 12 hour pause ~~and then~~, followed by another 88-hour period of drilling ~~event~~ (at the southern OSP). ~~Suspended sediments concentrations and sediment plume extent progressively increase across the drilling event. After~~ The location of the two releases is such that, due to the orientation of the tidal axis and the absence of wave influence, there is opportunity for the disturbed sediment to be additive. These timings have been developed based on expert judgment of comparative works, informed by active engagement with the industry and consultation with subject matter experts.

6.2.1.26 Modelling of SSCs indicates that SSC increase with drilling duration, with greater spatial extents predicted under higher current speeds. In all scenarios, elevated SSC remain confined within the Zone of Influence (ZoI). Peak SSC occur towards the end of drilling at each location, with higher concentrations associated with OSP drilling due to greater volumes of drill arisings (5,280 m³ (Project Design Option 1) and 7,040 m³ (Project Design Option 2) for WTG foundations, compared to 13,860 m³ for the OSP).

6.2.1.27 Under high ebb (southerly) current conditions, following completion of WTG drilling ~~the greatest SSC is within the centre of the plume (~~(88 hours), peak SSC of approximately 25 mg/l~~)~~ are predicted within the plume centre, with concentrations dissipating prior to commencement of OSP drilling. During OSP drilling, SSC ~~of over~~exceeding 100 mg/l are ~~expected at the point of activity, reducing to <25 mg/l after 12 hours, 18 km to the north of the drilling activity. Two days following cessation of drilling activities SSCs are undiscernible from background levels. Sediment deposition is expected to be approximately 15 mm immediately adjacent, following completion of drilling.~~confined to the immediate vicinity of the activity and reduce to <25 mg/l beyond the drilling location. Along the tidal axis, SSC <25 mg/l extend up to approximately 18 km to the north in a narrow plume (<1 km wide) and up to approximately 6 km to the south.

~~6.2.1.7 At the landfall the use of techniques such as HDD could also result in an increase in suspended sediments and sediment deposition at the exit point(s), including release of bentonite (drilling mud). Modelling of SSC at the HDD shows maximum concentrations of 50 mg/l with concentrations no greater than 2.5 mg/l outside the Proposed Development. For sediment deposition, 6.5 days after cessation of works a maximum deposition of 7.5 mm is predicted within 0.3 km.~~

~~6.2.1.8 Confirmatory Surveys activities include a range of methods which will disturb the seabed, on a short-term and localised basis, due to the placement of an instrument and its' mooring system on the seabed to sediment removal (as boreholes/ grabs). No modelling has been undertaken for confirmatory surveys. However, sediment disturbance resulting from confirmatory surveys activities will typically be of shorter duration (hours to days), lesser magnitude and localised when compared to those resulting from site preparation, foundation and cable installation works.~~

~~6.2.1.9 The design scenario assumes the installation of 110-122 km of inter array cables, 25-40 km of export cables and 25-28 km of interconnector cables. Computational modelling has been undertaken for installation of the cables. Numerical modelling show that the greatest increase in SSC is observed immediately adjacent to the works (approx. 500 mg/l), with levels above background (2.5 mg/l) being observed 8 km away from the disturbance event. Sediment deposition of 25 mm occur within 1 km and <2.5 mm at 10 km.~~

~~6.2.1.10 The outputs of the coastal processed modelling were used to determine whether or not increases in suspended sediments and associated sediment deposition would lead to an adverse effect on Annex I QIs of the identified SACs, when considering the COs of the relevant QIs of the SACs.~~

6.2.1.28 Twelve hours following completion of OSP drilling, SSC up to approximately 2.5 mg/l are predicted up to approximately 7 km south of the Array Area, with maximum concentrations of approximately 10 mg/l confined to within several hundred metres of the works. Approximately two days following completion, no measurable elevated SSC is observed. Under low current conditions, SSC magnitudes are similar, with a greater areal extent of ~2.5 mg/l elevations, remaining within the ZoI. These results should be considered in the context of ambient background turbidity as outlined in paragraph 6.2.1.11, with baseline average (31.7 mg/l) and maximum (74.6 mg/l) values of near-bed turbidity.

6.2.1.29 The depth and spatial extent of sediment deposition increase over the course of foundation installation activities, with deposition controlled by tidal currents and occurring within the ZoI. Deposited material is expected to be subject to ongoing tidal- and wave-driven reworking in the energetic conditions present at the site. Deposition is greatest under lower (flood; northerly) tidal current conditions, and results from these scenarios are therefore considered representative of the maximum deposition case.

6.2.1.30 Twelve hours following completion of WTG drilling, sediment deposition exceeding approximately 15 mm is predicted immediately adjacent to the foundation, with a narrow (<0.25 km wide) depositional footprint extending up to approximately 12 km along the tidal axis. Following commencement and completion of OSP drilling, a second depositional area develops, again concentrated in the immediate vicinity of the works, with maximum deposition depths of approximately 15 mm predicted following completion of OSP installation.

6.2.1.31 See Figure 6.~~2~~4 and Figure 6.~~3~~5 for the numerical modelling simulations of SSCs and associated sediment deposition undertaken for foundation installation using drilling techniques, and for the resulting sediment plume extent in relation to the SACs screened in for Annex I Coastal and Marine Habitats.

SANDWAVE CLEARANCE INCLUDING SPOIL DISPOSAL VIA A TRAILER SUCTION HOPPER DREDGER IN THE CABLE CORRIDOR AND WORKING AREA

6.2.1.32 Sandwaves may be cleared along a corridor of 70 m in width (for each cable) with 10 m depth of material being relocated. This may occur across 30% (12 km) of the total export cable length (maximum 40 km), resulting in, circa, 500,000 m^3 to be excavated using a TSHD with an assumed hopper volume of 20,000 m^3. The behaviour of the sediment upon collection and as spoil is presented in paragraph 6.2.1.12.

6.2.1.33 Numerical modelling has simulated the filling of a TSHD hopper load, in addition to overspill, followed by discharged at a spoil disposal site (as set out in NIS Volume III, Appendix 6.1: Marine Physical Processes Numerical Modelling (Revised March 2026)). Results are presented for disposal at Zone 5 (Figure 6.6 and Figure 6.7) in order to identify potential impacts to the nearby Wicklow Reef SAC.

6.2.1.34 Disposal of the TSHD load at the Zone 5 disposal site initially results in the formation of a thin (less than 0.2 km wide) plume within 11 km of the seabed works, with maximum concentrations of the order of 2,000 mg/l immediately adjacent to the TSHD location. As this plume is advected by the tidal currents along the tidal axis, it is also dispersed such that the SSC levels reduce with increasing distance from the release location. Measurable elevated SSC (above 1 mg/l) is not predicted after five hours following the disposal, and are not shown to disperse beyond 8 km from the Cable Corridor and Working Area. These results should be considered in the context of ambient background turbidity as outlined in paragraph 6.2.1.11, with baseline average (31.7 mg/l) and maximum (74.6 mg/l) values of near-bed turbidity.

6.2.1.35 Sediment deposition is shown when under higher current speeds because the resultant deposition is shown to have a greater areal extent and lower thickness than under lower current speeds when the resultant deposition is shown to have a lesser areal extent and relatively larger thickness. The deposition location aligns with the axis of tidal flow, which are relatively linear to the north and south of Arklow Bank. Sediment deposition is greatest in the vicinity of the disturbance activity, with thicknesses up to 250 mm occurring within 1 km. Beyond this, the thickness of deposited sediment rapidly reduces such that at 10 km from the active disturbance, the deposited thickness is of the order of 2.5 mm. Beyond this, the thickness of deposited sediment becomes immeasurable. In reality, deposited sediment will become re-worked and entrained back into the sediment transport system under the actions of both tides and waves.

6.2.1.36 Figure 6.6 and Figure 6.7 illustrates the results of numerical modelling simulations of SSCs and associated sediment deposition undertaken for seabed preparation for foundation installation and associated spoil disposal at the Zone 5 disposal site, and for the resulting sediment plume extent in relation to the SACs screened in for Annex I Coastal and Marine Habitats.

PRE-LAY CABLE TRENCHING AT THE SEABED IN THE CABLE CORRIDOR AND WORKING AREA

6.2.1.37 Of the different pre-lay cable trenching techniques considered by the Developer, for which more information is presented in Section 4 of NIS Volume I: Supporting Information for Screening for Appropriate Assessment Report (Revised March 2026), and EIAR Volume II, Chapter 4: Description of Development (Revised March 2026), the use of CFE has been numerically assessed here as it provides the potential for seabed sediment to be disturbed to the greatest extent into the water column . As presented in Table 6.3, this process would be used to excavate a trench with a width at the seabed of 15 m and a depth of 2.5 m and represents a maximum total seabed area of disturbance of 600,000 m^2. Results are presented for operations within both the northern and southern extents of Cable Corridor and Working Area.

6.2.1.38 For the purposes of the northern scenarios modelled for this assessment, the tool is simulated to be moving along a 2 km section of the cable route, approximately 5.2 km offshore. The tool moves at a rate of 50 m per hour, such that trenching activities are continuous for 40 hours and the material is released 3 m above the bed. For the purpose of the southern scenario modelled for this assessment, the tool is simulated to be moving along a 2.2 km section of the cable route, before travelling to the site of the exit pit (taking approximately 10 minutes). Then a further excavation occurs for 400 m from the centre of the exit pit for a period of 60 minutes. The material is released at 3 m above the seabed. These timings have been developed based on expert judgment of comparative works, informed by active engagement with the industry and consultation with subject matter experts.

6.2.1.39 Full details of the assumptions and parameters used in the modelling scenarios are provided in NIS Volume III, Appendix 6.1: Marine Physical Processes Numerical Modelling (Revised March 2026).

6.2.1.40 Figure 6.8 and Figure 6.9 show SSC and deposited sediment for CFE trenching operations in the northern part of the Cable Corridor and Working Areas, and Figure 6.10 and Figure 6.11 show the numerical modelling outputs of SSC and associated deposition for CFE trenching operations in the southern part of the Cable Corridor and Working Areas.

6.2.1.41 Numerical modelling results for CFE trenching operations at the north and south of the Cable Corridor and Working Areas indicate that the spatial distribution of elevated SSC is greater under higher tidal currents, whereas lower tidal current speeds result in plumes with a smaller area but higher concentrations in the plumes' centre. The greatest increase in SSC is observed immediately adjacent to the active works, with levels circa 1,500 mg/l although reaching up to 2,500 mg/l in some areas. Concentrations are higher at the northern location, with maximum concentrations at the southern scenario not exceeding 1,500 mg/l. Levels above background (2.5 mg/l) are observed up to 10 km from the point of disturbance for the northern scenario, and 14

km at the southern scenario. In the south, the reversal of the tide can also be observed, with linear plumes extending both northeast and southwest of the modelled cable route. Following completion of the active seabed disturbance, the elevated SSC rapidly reduces such that levels are comparative to background concentrations. These results should be considered in the context of ambient background turbidity as outlined in paragraph 6.2.1.11, with baseline average (31.7 mg/l) and maximum (74.6 mg/l) values of near-bed turbidity.

6.2.1.42 Sediment deposition is shown when under higher current speeds because the resultant deposition is shown to have a greater areal extent and lower thickness than under lower current speeds when the resultant deposition is shown to have a lesser areal extent and relatively larger thickness. The deposition location aligns with the axis of tidal flow, which are relatively linear to the north and south of Arklow Bank. Sediment deposition is greatest in the vicinity of the disturbance activity, with thicknesses up to 150 mm (for the southern scenario) and 100 mm (for the northern scenario) occurring within 1 km. Beyond this, the thickness of deposited sediment rapidly reduces such that less than 2 km from the active disturbance, the deposited thickness is less than 2.5 mm for both scenarios. Beyond 2 km away, the thickness of deposited sediment becomes immeasurable. In reality, deposited sediment will become re-worked and entrained back into the sediment transport system under the action of both tides and waves.

6.2.1.43 Offshore export cable installation closer to the coastline may potentially lead to a small amount of localised sedimentation on the foot of the dunes at the Magherabeg Dunes and Buckroney-Brittas Dunes and Fen SACs (see Figure 6.9). In the event that any sediment is deposited here, the sediment deposited would be native to the site and would be neutral to beneficial in the accretive behaviour of the dune systems.

DRILLING FLUID RELEASE DURING HDD, OR OTHER TRENCHLESS TECHNIQUE, OPERATIONS

6.2.1.44 The subsea export cable ducts will be installed underneath the beach using trenchless installation techniques as detailed in NIS Volume I: Supporting Information for Screening for Appropriate Assessment Report (Revised March 2026) and outlined in Table 6.3. The drilling activity utilises a viscous drilling fluid which consists of a mixture of water and bentonite, a non-toxic, naturally occurring clay mineral. The release of drilling fluid and drill cuttings from trenchless techniques will result in a plume of elevated SSC. The drilling fluid has an overall density and viscosity similar to seawater and so is anticipated to behave in a similar manner.

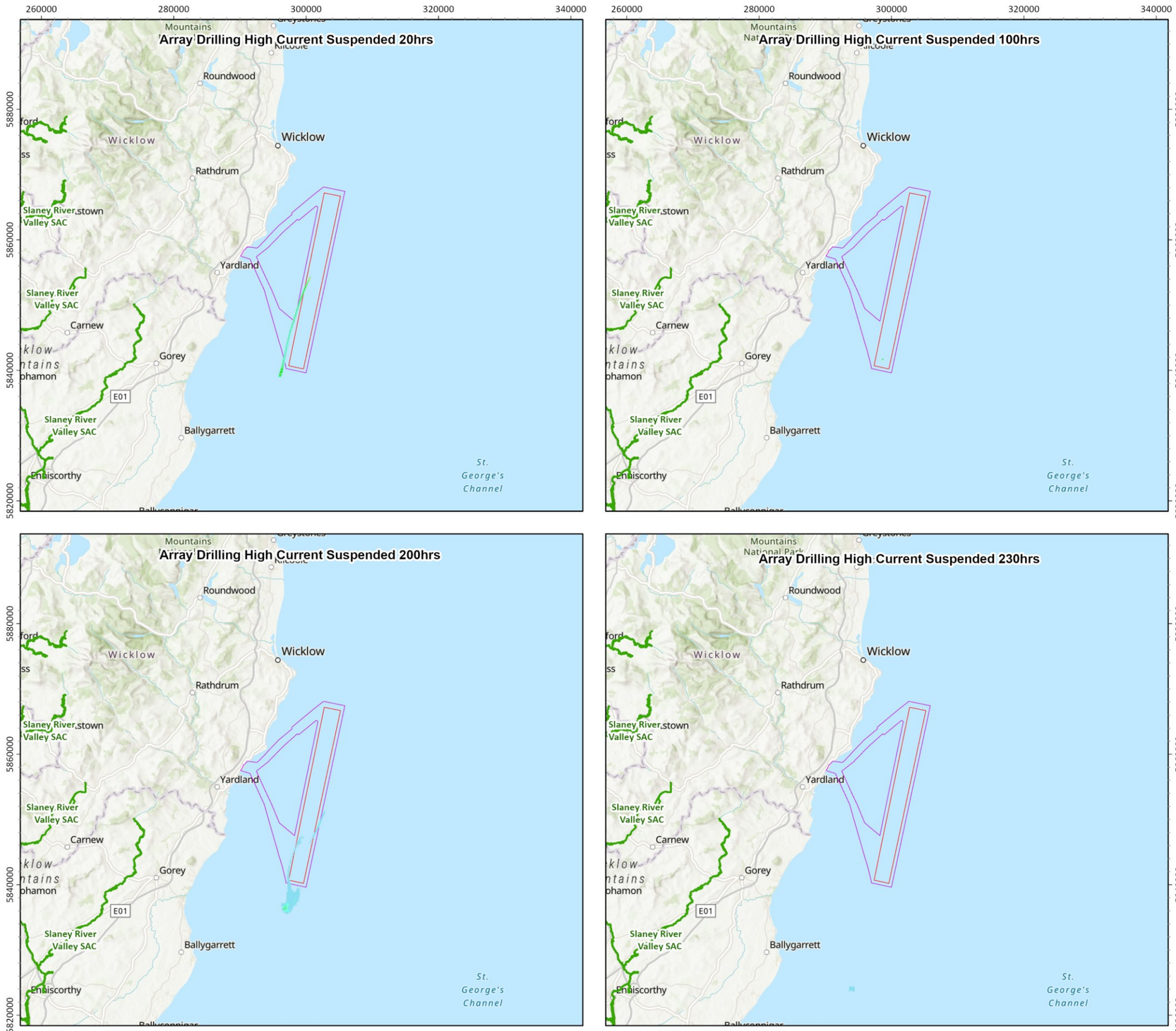
6.2.1.45 Numerical modelling has been used to simulate the release of bentonite over a 4.5 day period during HDD operations which are considered representative of other trenchless operations. Further detail is provided in NIS Volume III, Appendix 6.1: Marine Physical Processes Numerical Modelling (Revised March 2026).

6.2.1.46 The modelling results demonstrate that elevated SSC will be of localised extent and temporary duration, with maximum concentrations of 50 mg/l occurring only at the location of the punch-out HDD exit pit and during the installation works. Rapid dispersion by tides and waves will result in the immediate dispersion and dilution of these concentrations. SSC is advected along the coast along the tidal axis to distances of up to 4 km, although concentrations at this distance are limited to below 25 mg/l. Of note is that dispersion to the south, following a release during a high spring southerly current is, approximately, 1 km less than under the equivalent northerly release (see Figure 6.34 of EIAR Volume II, Chapter 6: Coastal Processes (Revised March 2026)). Away from the Landfall HDD activities and outside the Cable Corridor and Working Area, but within the ZoI, SSC levels are shown to be no greater than 2.5 mg/l. These results should be considered in the context of ambient background turbidity as outlined in paragraph 6.2.1.11, with baseline average (31.7 mg/l) and maximum (74.6 mg/l) values of near-bed turbidity. While these values are based on data from more offshore areas, turbidity is generally higher close to the coast than offshore due to shallower water depths and terrestrial input, and these values are therefore able to demonstrate a precautionary baseline.

6.2.1.47 Sediment deposition following cessation of HDD activities is shown in Figure 6.35 of EIAR Volume II, Chapter 6: Coastal Processes (Revised March 2026). Deposition that is measurable in practice occurs within the immediate proximity of the Landfall works, remaining within the Cable Corridor and Working Area. Maximum deposition occurs during the activity as a result of the active release of the bentonite. Following cessation of the works, any deposited sediment will be re-worked by the tide and wave regimes, reducing its area and depth. Here, 6.5 days following the commencement of installation works, a maximum deposition of 7.5 mm is predicted within a coastal extent of 0.3 km within the Cable Corridor and Working Area (Figure 6.35 of EIAR Volume II, Chapter 6: Coastal Processes (Revised March 2026)). A similar pattern of deposition is predicted for releases during a northerly and southerly tidal flow. Deposition predicted for releases during high tidal flows, for both northerly and southerly flow, indicates a wider spread of deposition than during the low tidal flows. This is to be expected due to the higher (faster) currents distributing sediment over a wider area. The directionality of the tidal flows is such that any deposited sediment is not transported, and ultimately deposited, in the offshore environment and remains close to the coast.

6.2.1.48 In summary therefore, any measurable increases in SSC and deposition are relatively small-scale, highly localised and are expected to be rapidly redistributed by wave and tidal action.

~~6.2.1.11 The results of the sediment modelling can be seen in~~ Figure 6.2~~4 and~~ Figure 6.3~~:~~5.



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Arklow Bank Wind Park 2

Suspended Sediment Concentrations Following Drilling for Foundation Installation

Legend

- ABWP2 Array Area
- ABWP2 Cable Corridor and Working Area
- Special Area of Conservation (SAC)

Suspended Sediment (mg/l)

- 1 - 2.49
- 2.5 - 4.99
- 5 - 9.99
- 10 - 24.99
- 25 - 49.99
- 50 - 99.99
- 100 - 249.99



Notes

Esri UK, Esri, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS, OceanWise, Esri, GEBCO, Garmin, NaturalVue, Esri, CGIAR, USGS, Esri UK, Esri, TomTom, Garmin, FAO, NOAA, USGS. Contains Ordnance Survey data © Crown copyright and database rights (2022). OS OpenData.

Coordinate System:
ETRS 1989 UTM Zone 30N

0 10 20 km

0 6 11 nm

Scale	Date	Drawn By	Checked By	Approved By
1:550,000 @ A3	28/03/2024	xx	xx	xx

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Figure Number 6.2

Figure Reference: Ark_002_SuspendedSediment_ArrayDrilling_NIS_Fig6.2

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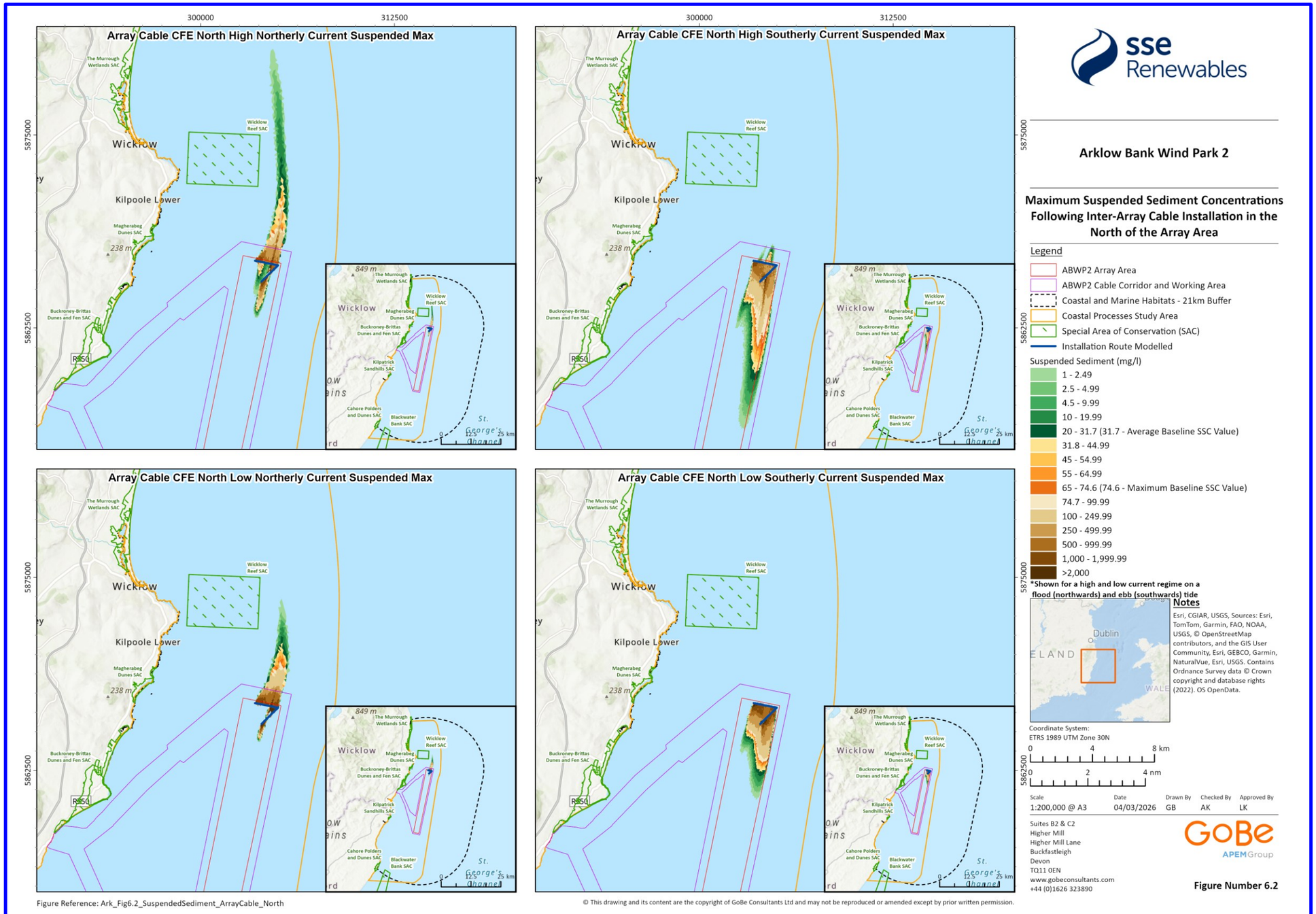

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Figure 6.2: Maximum[2] suspended sediment following inter-array cable installation in the north of the Array Area. Shown for a high and low current regime on a flood (northwards) and ebb (southwards) tide.

[2] Where the values shown are the maximum SSC that occur within the model domain at any time during the numerical simulation. As such, the results shown on this figure may be from different timesteps.

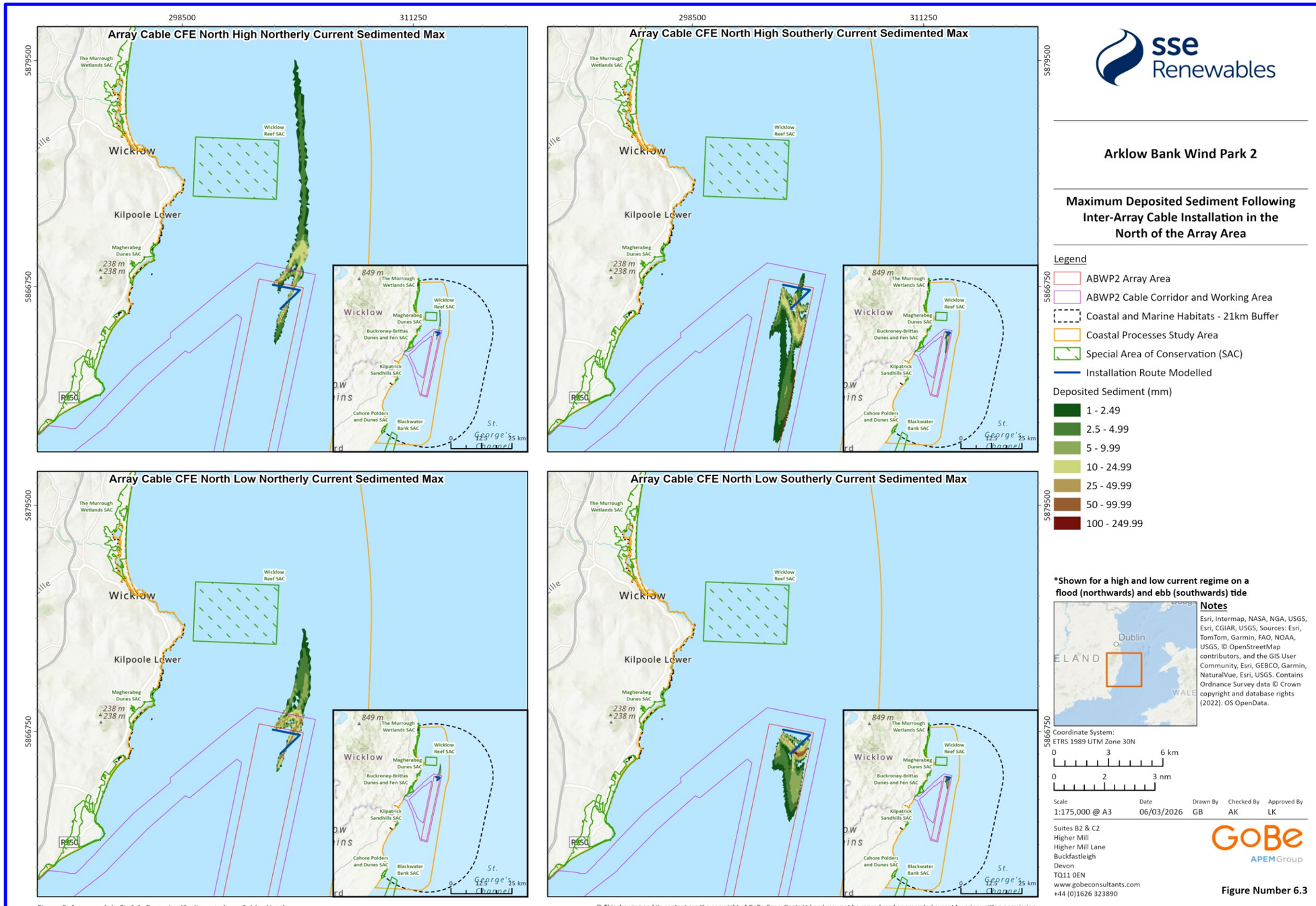

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Figure 6.3: Maximum[3] deposited sediment following inter-array cable installation in the north of the Array Area. Shown for a high and low current regime on a flood (northwards) and ebb (southwards) tide.

[3] Where the values shown are the maximum deposition that occur within the model domain at any time during the numerical simulation. As such, the results shown on this figure may be from different timesteps.

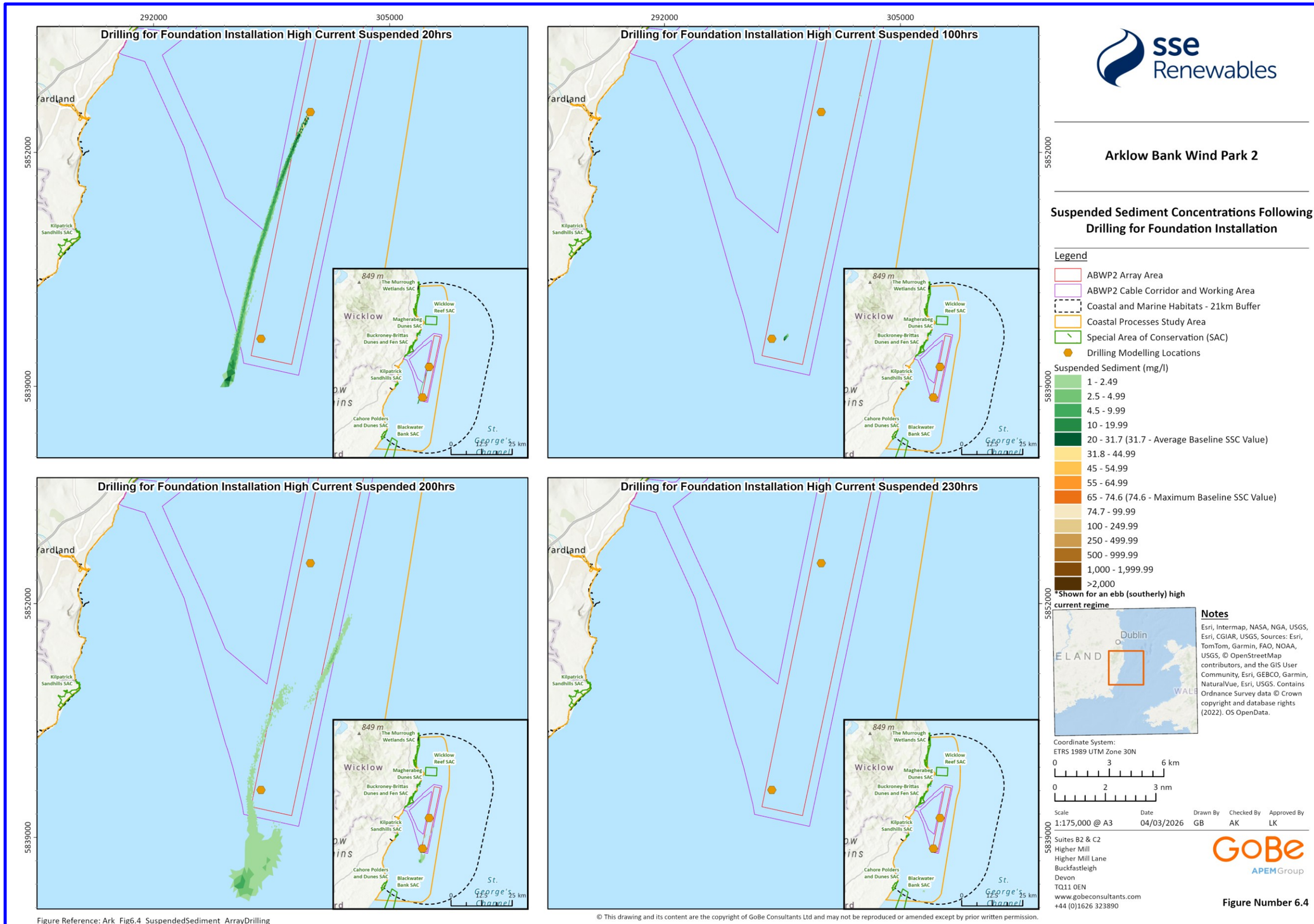

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Figure 6.24: Suspended sediment concentrations following drilling for foundation installation. Shown for an ebb (southerly) high current regime.

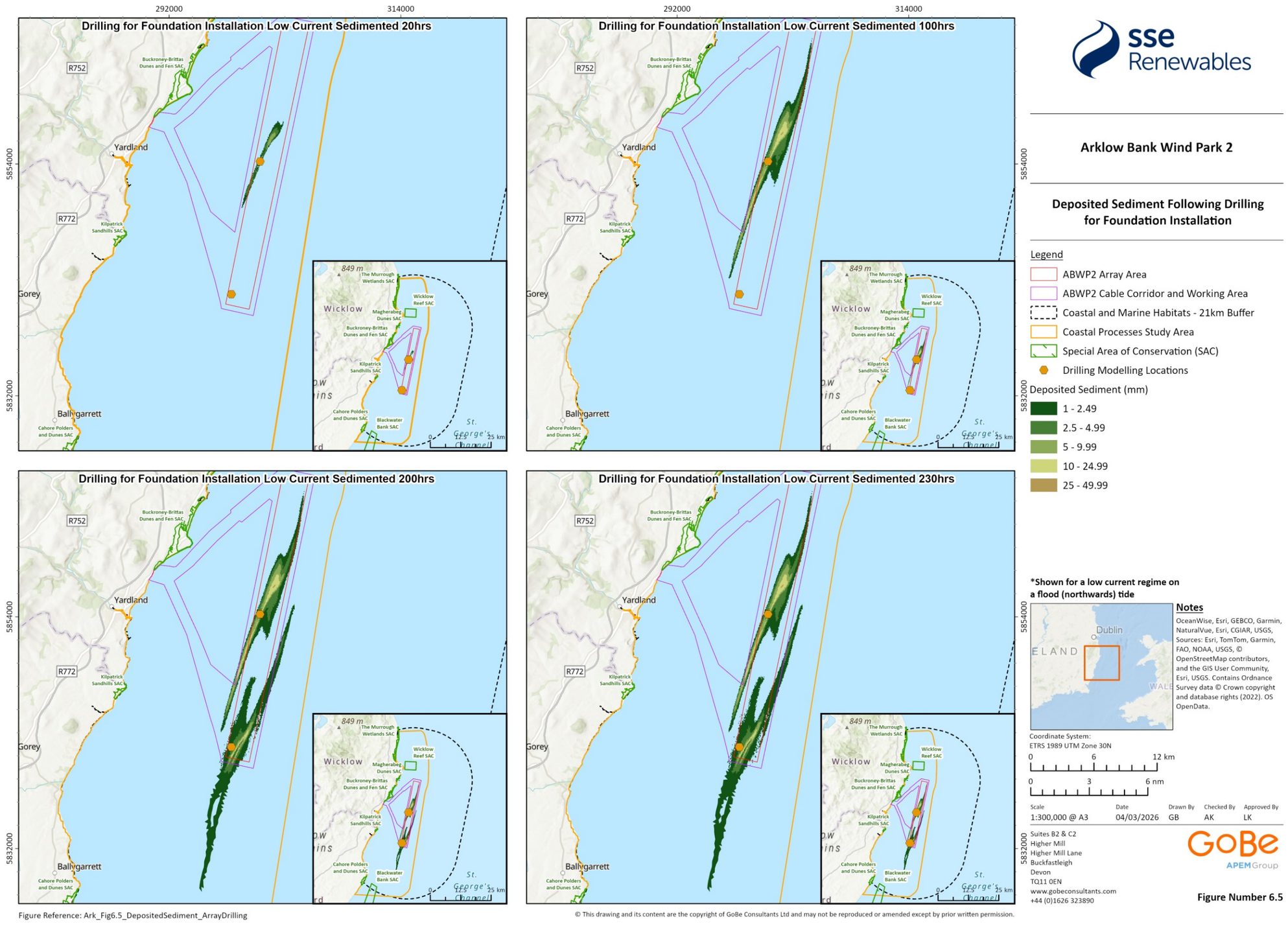

Figure Reference: Ark_Fig6.5_DepositedSediment_ArrayDrilling

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Figure 6.~~3~~5 Deposited sediment following drilling for foundation installation. Shown for a low current regime on a flood (northwards) tide.

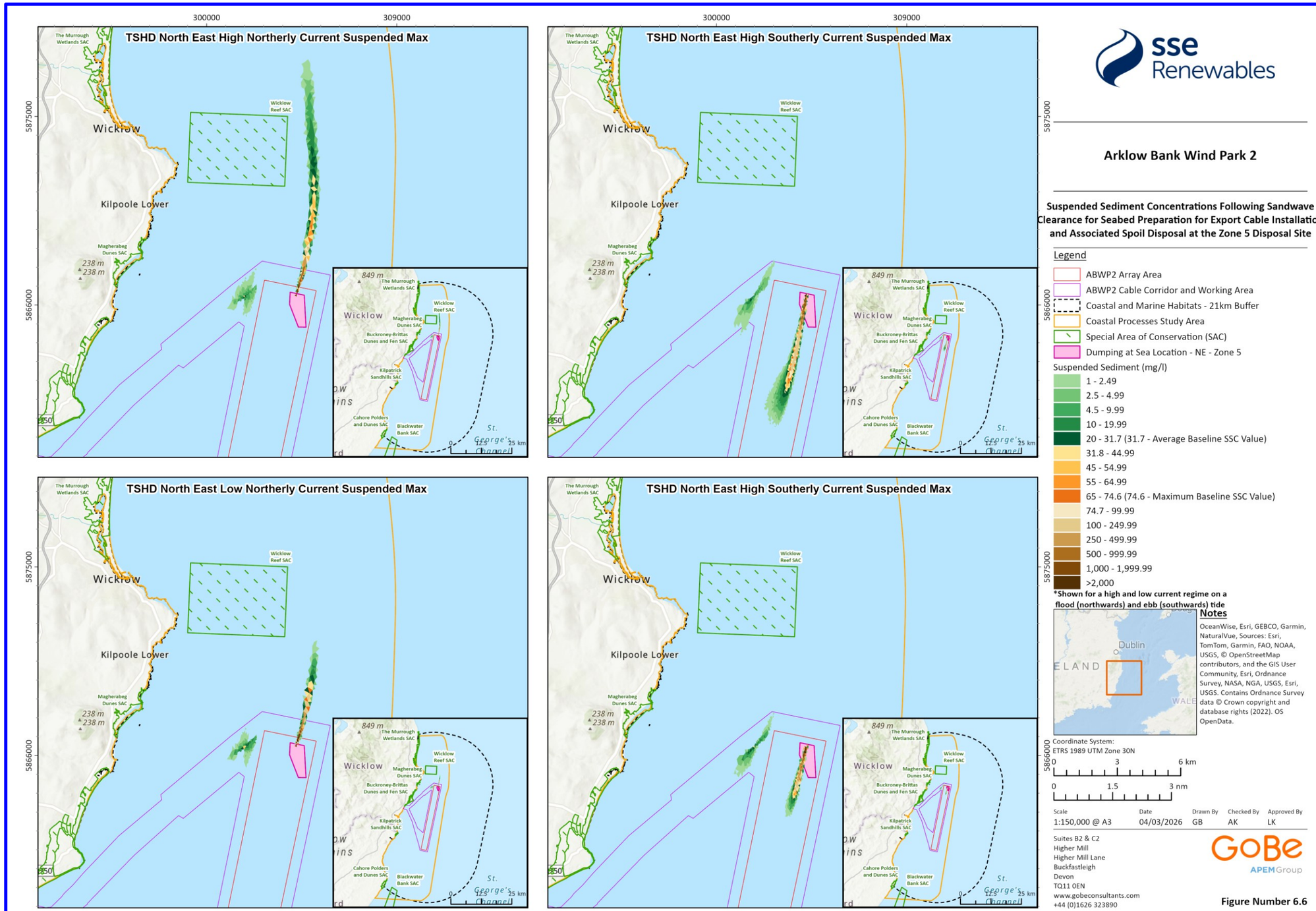

Figure Reference: Ark_Fig6.6_SuspendedSediment_ExportCable_Zone5

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Figure 6.6: Suspended sediment concentrations following sandwave clearance for seabed preparation for export cable installation and the associated spoil disposal at the Zone 5 disposal site. Shown for a flood (northerly) high current regime.

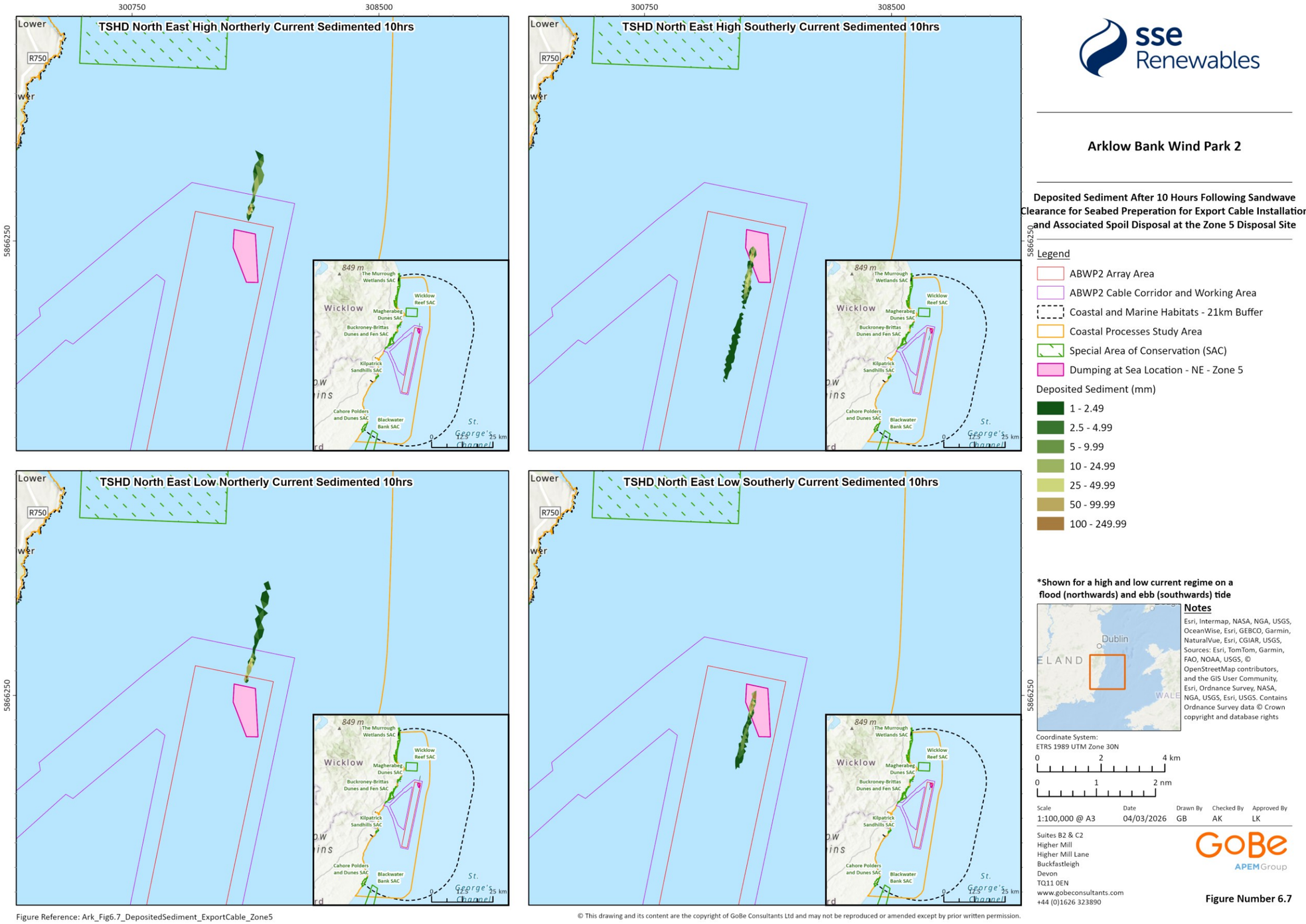

Figure 6.7: Deposited sediment following sandwave clearance for seabed preparation for export cable installation and the associated spoil disposal activities at the Zone 5 disposal site. Shown for a high and low current regime on a flood (northwards) and ebb (southwards) tide.

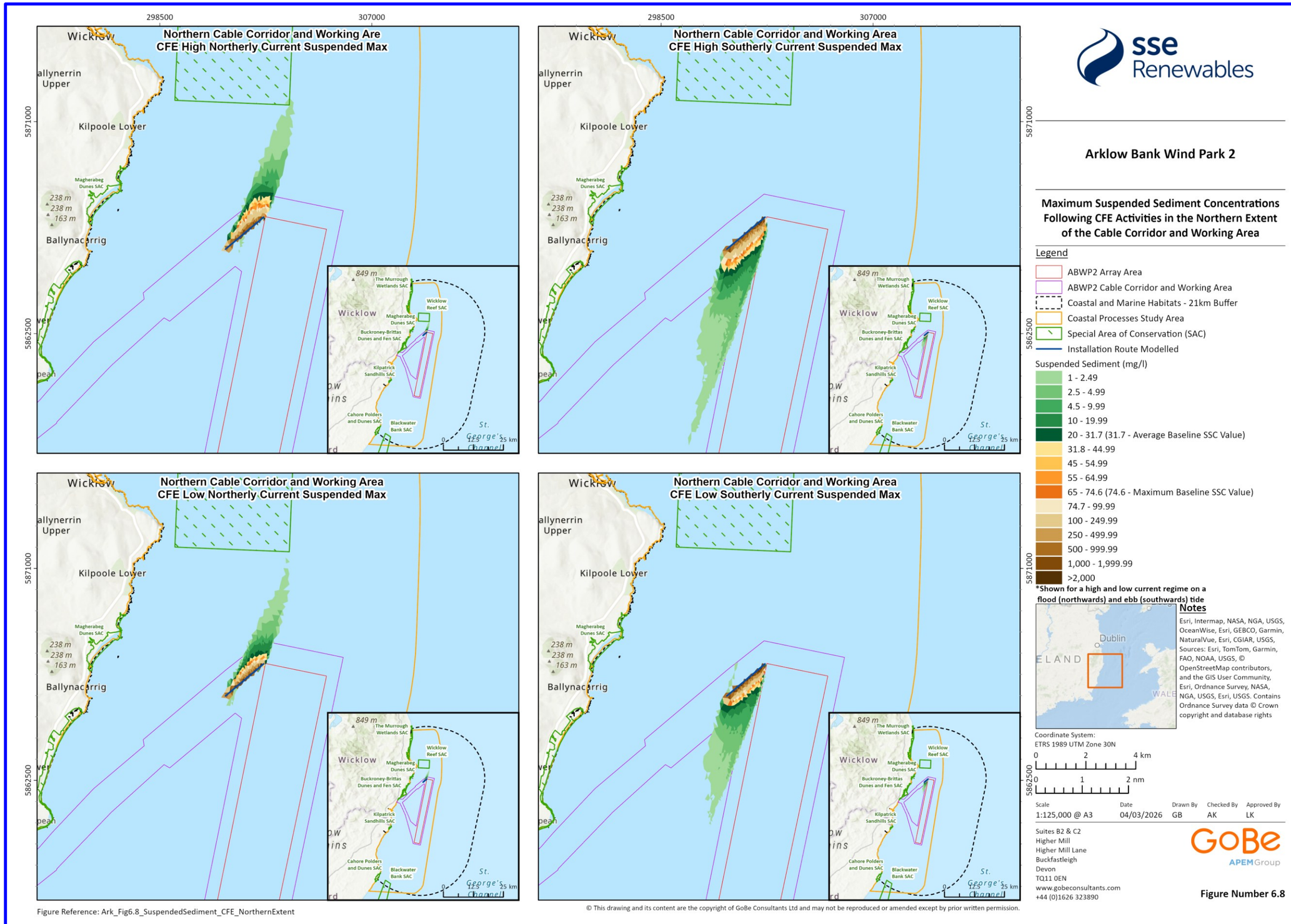

Figure Reference: Ark_Fig6.8_SuspendedSediment_CFE_NorthernExtent

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Figure 6.8: Suspended sediment concentrations following CFE activities within the northern extent of the Cable Corridor and Working Area. Shown for a flood (northerly) low and high current regime.[4]

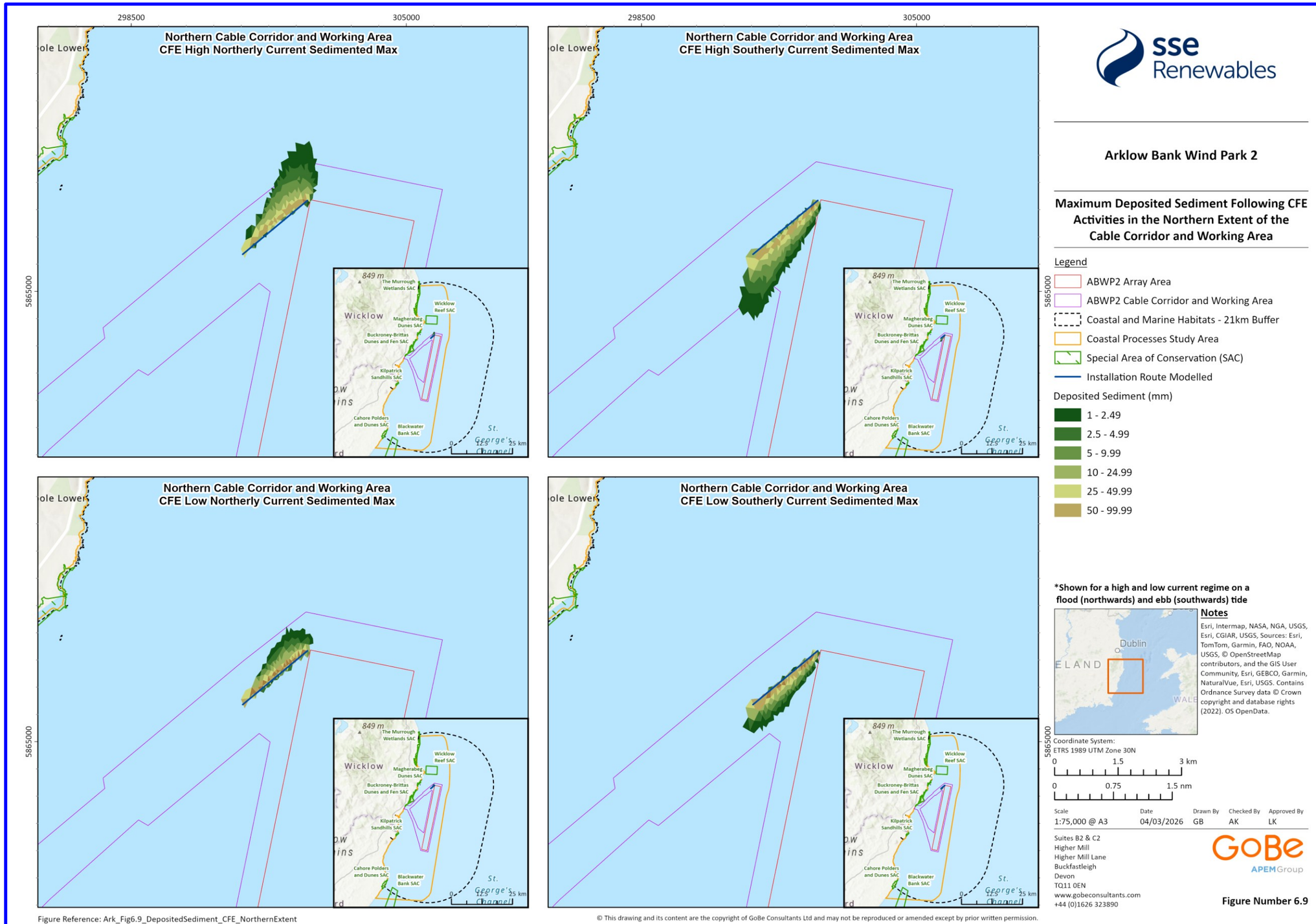

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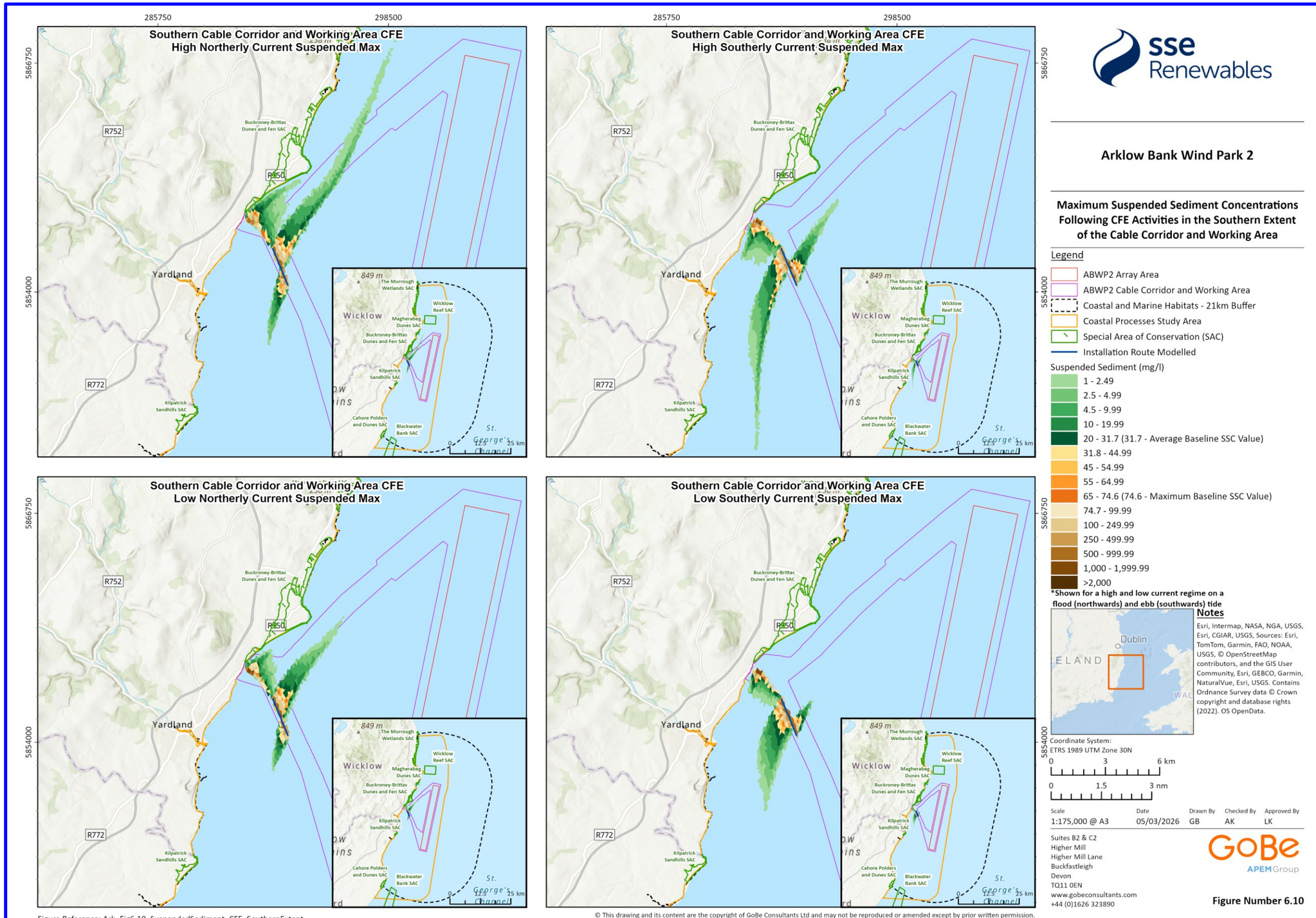
Figure 6.9: Deposited sediment following completion of CFE activities within the northern extent of the Cable Corridor and Working Area. Shown for a high and low current regime on a flood (northwards) and ebb (southwards) tide.



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Arklow Bank Wind Park 2

Maximum Suspended Sediment Concentrations Following CFE Activities in the Southern Extent of the Cable Corridor and Working Area

Legend

- ABWP2 Array Area
- ABWP2 Cable Corridor and Working Area
- Coastal and Marine Habitats - 21km Buffer
- Coastal Processes Study Area
- Special Area of Conservation (SAC)
- Installation Route Modelled

Suspended Sediment (mg/l)

- 1 - 2.49
- 2.5 - 4.99
- 4.5 - 9.99
- 10 - 19.99
- 20 - 31.7 (31.7 - Average Baseline SSC Value)
- 31.8 - 44.99
- 45 - 54.99
- 55 - 64.99
- 65 - 74.6 (74.6 - Maximum Baseline SSC Value)
- 74.7 - 99.99
- 100 - 249.99
- 250 - 499.99
- 500 - 999.99
- 1,000 - 1,999.99
- >2,000

*Shown for a high and low current regime on a flood (northwards) and ebb (southwards) tide

Notes

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Coordinate System:
ETRS 1989 UTM Zone 30N

0 3 6 km

0 1.5 3 nm

Scale	Date	Drawn By	Checked By	Approved By
1:175,000 @ A3	05/03/2026	GB	AK	LK

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Figure Number 6.10

Figure Reference: Ark_Fig6.10_SuspendedSediment_CFE_SouthernExtent

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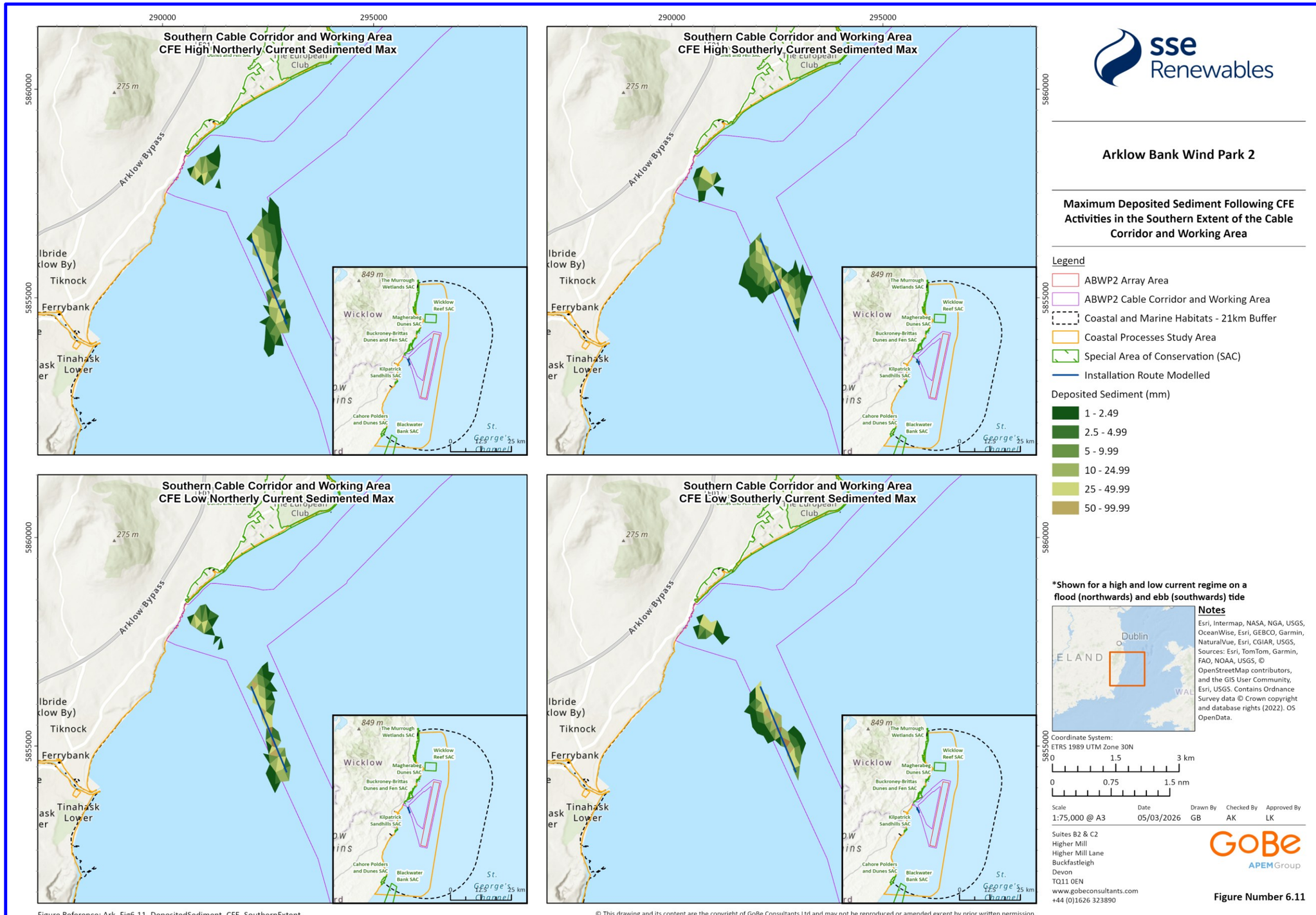
Figure 6.10: Suspended sediment concentrations following CFE activities within the southern extent of the Cable Corridor and Working Area. Shown for a flood (northerly) low and high current.



sse Renewables

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Arklow Bank Wind Park 2

Maximum Deposited Sediment Following CFE Activities in the Southern Extent of the Cable Corridor and Working Area

Legend

- ABWP2 Array Area
- ABWP2 Cable Corridor and Working Area
- Coastal and Marine Habitats - 21km Buffer
- Coastal Processes Study Area
- Special Area of Conservation (SAC)
- Installation Route Modelled

Deposited Sediment (mm)

- 1 - 2.49
- 2.5 - 4.99
- 5 - 9.99
- 10 - 24.99
- 25 - 49.99
- 50 - 99.99

*Shown for a high and low current regime on a flood (northwards) and ebb (southwards) tide

Notes

Esri, Intermap, NASA, NGA, USGS, OceanWise, Esri, GEBCO, Garmin, NaturalVue, Esri, CGIAR, USGS, Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community, Esri, USGS. Contains Ordnance Survey data © Crown copyright and database rights (2022). OS OpenData.

Coordinate System:
ETRS 1989 UTM Zone 30N

0 1.5 3 km

0 0.75 1.5 nm

Scale	Date	Drawn By	Checked By	Approved By
1:75,000 @ A3	05/03/2026	GB	AK	LK

Suites B2 & C2
Higher Mill
Higher Mill Lane
Buckfastleigh
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GoBe APEM Group

Figure Number 6.11

Figure Reference: Ark_Fig6.11_DepositedSediment_CFE_SouthernExtent

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Figure 6.11: Deposited sediment following completion of CFE activities within the southern extent of the Cable Corridor and Working Area. Shown for a high and low current regime on a flood (northwards) and ebb (southwards) tide.

MORPHODYNAMIC MODELLING

6.2.1.49 Morphodynamic modelling was undertaken to assess the potential for the Proposed Development to influence seabed behaviour at both local and regional scales. This assessment was based on a comparison of modelled seabed conditions for a baseline scenario representing existing conditions and a scenario including the proposed wind farm infrastructure. Numerical simulations were used to evaluate seabed response to the presence of wind turbines and associated infrastructure over long-term periods and under extreme event conditions.

6.2.1.50 The numerical modelling has modelled Project Design Option 1 (53 WTGs and 2 OSPs) which is considered representative of Project Design Option 2 (47 WTGs and 2 OSPs), due to the greater number of structures and therefore greater potential impact on the wave and hydrodynamic regimes.

6.2.1.51 Morphodynamic modelling represents the temporal evolution of the seabed arising from the combined effects of:

- currents and tides,
- waves, and
- sediment transport.

6.2.1.52 The modelling framework captures long-term trends in erosion, deposition, and sediment redistribution, rather than conditions at a single point in time. These processes are directly relevant to seabed integrity and the stability of sediment-dependent habitats, including offshore sandbanks, reefs and coastal systems that rely on sustained sediment supply.

6.2.1.53 Potential effects of the Proposed Development were evaluated by comparing predicted hydrodynamic conditions and seabed morphology between the baseline scenario and the scenario including the wind farm infrastructure.

6.2.1.54 For each scenario, two types of morphodynamic simulations were undertaken:

- a long-term morphodynamic simulation covering a 20-year period (see NIS Volume III, Appendix 6.3: Arklow Bank - Quantitative Assessment of the Influence of In-place Infrastructure on the Local Sediment Transport System (RFI March 2026)); and
- a short-term storm morphodynamic simulation representing a 100-year return period event[5], undertaken to assess seabed response under extreme conditions (see NIS Volume III, Appendix 6.3: Arklow Bank - Quantitative Assessment of the Influence of In-place Infrastructure on the Local Sediment Transport System (RFI March 2026)).

6.2.1.55 The following provides a summary of morphodynamic modelling results relevant to this assessment. Full details of the model setup, comprehensive results, and interpretation of potential local and larger-scale effects are presented in NIS Volume III, Appendix 6.2: Arklow Bank Sediment Mobility Assessment (RFI March 2026) and NIS Volume III, Appendix 6.3: Arklow Bank - Quantitative Assessment of the Influence of In-place Infrastructure on the Local Sediment Transport System (RFI March 2026).

6.2.1.56 Morphodynamic modelling indicates that the introduction of the Proposed Development infrastructure would result in minor and highly localised changes to hydrodynamic conditions and seabed processes. Reductions in flow velocity are typically less than 5%, and changes in wave height are generally below 1%, confined to areas immediately surrounding individual monopile

[5] A 100-year return period (RP100) event is a storm or extreme wave/current event that has a 1% probability of occurring in any given year.

foundations. These effects will hence not alter the wider hydrodynamic regime or sediment dynamics at a scale notable to the designated Annex I Coastal and Marine Habitats.

6.2.1.57 Over the 20-year simulation period, the large-scale morphodynamic behaviour of Arklow Bank is preserved. Characteristic eastward and westward migration patterns remain consistent with the baseline scenario, and net volumes of erosion and sedimentation will remain effectively unchanged. Localised differences in bed level and sediment transport, limited to areas adjacent to monopiles, are typically around a 10% reduction. Overall slope patterns and bank integrity are maintained, with no indication of increased seabed instability.

6.2.1.58 During the simulated extreme storm events, no significant differences in seabed response or sediment transport are predicted between the baseline and infrastructure scenarios, demonstrating that the Proposed Development does not exacerbate erosion, deposition, or sediment mobilisation under extreme hydrodynamic conditions.

6.2.1.59 At a wider spatial scale, the model predicts that impacts on adjacent sandbanks and on regional sediment transport pathways are negligible. The ZoI of the proposed infrastructure is confined to Arklow Bank and immediately adjacent areas, with no alteration of sediment pathways that support offshore sandbank features or coastal sediment-dependent habitats.

6.2.1.60 The modelling further indicates that the crest elevation and morphological function of Arklow Bank are maintained with the Proposed Development in place. This confirms that the bank will continue to play its natural role in reducing wave energy offshore and providing shelter to the adjacent coastline. As a result, the nearshore wave climate and sediment transport processes that support coastal dune, saltmarsh, and wetland habitats at nearby designated sites will remain unaffected.

6.2.2 Wicklow Reef SAC

6.2.2.1 The conservation objective for ~~reefs within~~ Wicklow Reef SAC is to maintain the favourable conservation condition of reefs in Wicklow Reef SAC (NPWS, 2013a), which is defined in Table 5.1.

6.2.2.2 There are ~~two~~three potential impacts on reefs associated with the construction, operational and maintenance and decommissioning of the Proposed Development, which are ~~presented~~detailed in Table 6.3 and are assessed below for each phase of the Proposed Development~~.~~:

- Elevated levels of SSCs and associated sediment deposition;
- Accidental release of pollutants; and
- Changes to physical processes.

ELEVATED LEVELS OF SUSPENDED SEDIMENT CONCENTRATIONS AND ASSOCIATED SEDIMENT DEPOSITION

CONSTRUCTION, OPERATIONAL AND DECOMMISSIONING

6.2.2.3 As determined in Table 6.3, Project Design Option 1 and Project Design Option 2 will have the same potential for adverse effects from elevated levels of suspended sediment and associated sediment deposition on coastal and intertidal benthic habitats.

6.2.2.4 It was identified at the Stage 1 Screening Appraisal that the Proposed Development did not present any risk to maintaining the favourable conservation condition of Annex I reef habitat with reference to conservation targets for 'Habitat area' or 'Distribution', as the Proposed Development would have no bearing whatsoever on whether or not the permanent area (or distribution as the case may be) of reef habitat is stable or increasing, subject to natural processes.

6.2.2.5 The SAC supporting document (NPWS, 2013a) notes that these targets refer to activities or operations that propose to permanently remove reef habitat, thus reducing the permanent amount

of reef habitat (or range over which this habitat occurs as the case may be). Importantly, the targets do not refer to temporary or short-term disturbance of the biology of reef habitats. On this basis, these conservation targets will not be undermined by the predicted increases in ~~suspended sediment concentrations~~SSCs during the construction phase of the Proposed Development.

6.2.2.6 The 'Community structure' target to conserve the reef community complex in a natural condition was identified as having the potential to be undermined by sediment plumes and associated sediment deposition. The results of the modelling discussed above ~~and in Volume III, Appendix 6.1: Marine Physical Processes Numerical Modelling of the NIS~~(see Section 6.2; Figure 6.2 to Figure 6.11), confirm that there is no potential for construction phase sediment plumes or associated sediment deposition to smother the reef habitats in Wicklow Reef SAC, which for this particular site is composed of subtidal *Sabellaria alveoleta* reef, or have any effects on the community composition characterising the Annex I reef habitats. The Proposed Development will have no bearing whatsoever on whether the reef community complex in Wicklow Reef SAC is conserved in a natural condition.

6.2.2.7 **There will be no AEoI ~~upon the integrity of~~to the Annex I reef habitat QI of the Wicklow Reef SAC, as defined by the COs of the site, as a result of ~~suspended sediments and sedimentation~~increased SSCs and associated deposition effects from Project Design Option 1.**

6.2.2.8 **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

ACCIDENTAL POLLUTION

CONSTRUCTION AND DECOMMISSIONING

6.2.2.9 As determined in Table 6.3, Project Design Option 1 ~~and Project Design Option 2~~ will have ~~the same~~a marginally higher potential for adverse effects from accidental pollution on coastal and intertidal benthic habitats than Project Design Option 2.

6.2.2.10 Construction of the Proposed Development and confirmatory surveys may lead to the accidental release of pollutants through spills and leaks from vessels and equipment. The magnitude of the impact is dependent on the quantities of potential pollutants carried by vessels, helicopters, and equipment. Although many of the large vessels (e.g. installation vessels) may contain large quantities of diesel oil, any accidental spill from vessels, vehicles, machinery from construction activities would be subject to immediate dilution and rapid dispersal. In the unlikely event of an accidental spill or release of chemicals or materials, any resulting effects would be negligible and would not interfere with the conservation objectives of the site, which relate to habitat area, habitat distribution, community structure.

6.2.2.11 The avoidance of effect through design and management measures of the Proposed Development includes an EMP and Marine Pollution Contingency Plan. Adherence to the avoidance by design and standard project environmental protection measures outlined in Table 6.2 and good working practices will significantly reduce the likelihood of an accidental pollution incident occurring and the magnitude of its impact. Given the factored-in measures, the likelihood of accidental release of pollutants is considered to be extremely low.

6.2.2.12 There is also a risk to Annex I reef habitats from water based drilling mud, including bentonite, a non-toxic, naturally occurring clay mineral, which is used ~~as a lubricant~~ during the cable installation via trenchless techniques. Trenchless techniques such as HDD and Direct Pipe will be undertaken to install the offshore export cables at the landfall and potentially across the sandbank for inter-array cable installation. Drilling muds are used in a closed system to minimise loss to the environment; however, it is possible that muds (including bentonite) can break out during drilling operations, which may occur in intertidal or subtidal areas. Bentonite is ~~low toxicity~~a

non-toxic, naturally occurring clay mineral used as a drilling mud and therefore the risk to reefs is minimal, particularly when considering that any break outs will be quickly diluted (seawater degrades the bentonite fluid, causing it to flocculate and allowing faster dispersal). However, any potential break outs or accidental spills of bentonite will be managed via good working practices (e.g. monitoring of mud volumes and pressure, detection of break outs and pausing drilling, plugging fissures and ongoing monitoring) such that any loss of bentonite to the environment is minimal and will not reach Annex I Marine Habitats QIs.

6.2.2.13 **Given the inherent low likelihood of accidental pollution from vessel activity, as well as the proposed avoidance/ impacts reduction measures (as set out in Table 6.2), there is no potential for AEoI from accidental pollution on the Annex I reef QI of the Wicklow Reef SAC, as defined by the COs of the site, from Project Design Option 1.**

6.2.2.14 **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

OPERATIONAL AND MAINTENANCE

6.2.2.15 As determined in Table 6.3, Project Design Option 1 ~~and Option 2~~ will have ~~the same~~a marginally higher potential for adverse effects from accidental pollution on coastal and intertidal benthic habitats than Project Design Option 2.

6.2.2.16 Operational and maintenance tasks within the Proposed Development may lead to the accidental release of pollutants through spills and leaks from vessels and equipment. The magnitude of the impact will be dependent on the quantities of potential pollutants carried by vessels, helicopters, and equipment. Although many of the large vessels (e.g. installation vessels) may contain large quantities of diesel oil, any accidental spill from vessels, vehicles, or machinery would be subject to immediate dilution and rapid dispersal. In the unlikely event of an accidental spill or release of chemicals or materials, any resulting effects would be negligible and would not interfere with the conservation objectives of the site, which relate to habitat area, habitat distribution, community structure.

6.2.2.17 Given the avoidance of effects by design, the likelihood of accidental release is considered to be extremely low. Adherence to the avoidance of effects by design outlined in Table 6.2Table 6.2: and good working practices will significantly reduce the likelihood of an accidental pollution incident occurring and the magnitude of its impact on reefs.

6.2.2.18 **Given the inherent low likelihood of accidental pollution from vessel activity as well as the proposed avoidance/ impacts reduction measures (as set out in** Table 6.2**), ~~and the low risk of pollution from cable installation via trenchless techniques such as HDD and Direct pipe,~~ there is no potential for AEoI from accidental pollution ~~on~~during the operational and maintenance phase on the Annex I reef QI of the Wicklow Reef SAC, as defined by the COs of the site, from Project Design Option 1.**

6.2.2.19 **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that the conclusion of no AEoI would also apply to Project Design Option 2.**

CHANGES TO PHYSICAL PROCESSES

OPERATIONAL AND MAINTENANCE

6.2.2.20 As determined in Table 6.3, Project Design Option 1 is considered representative of Project Design Option 2 for the assessment of potential adverse effects from changes to physical processes on coastal and intertidal benthic habitats.

6.2.2.21 Biogenic reefs are by nature sessile and as such will be unable to avoid changes in the physical environment such as those to the hydrodynamic regime and sediment supply. Physical processes

modelling indicates that any changes to water flow and wave height, sedimentation in relation to the Proposed Development will be minimal and will not extend to the Wicklow Reef SAC. Consequently, no impacts are anticipated on Annex I QIs in the SAC such as *Sabellaria* reefs which are known to have high tolerance and recoverability in relation to such pressures.

6.2.2.22 However, as detailed in Section 6.2.1 modelling designed to assess the impacts of the Proposed Development during the operational and maintenance phase on tidal currents, sediment transport and seabed dynamics (Deltares, 2025) indicates that any effects are not anticipated to extend to the regional or larger-scale sediment transport pathways in the south-western Irish sea. More specifically, site-specific modelling indicates that project related morphological and sediment transport changes at Arklow Bank will be insufficient to affect the morphological behaviour of receptors within the wider morphological system (Deltares, 2026).

6.2.2.23 Consequently, there is no potential for changes in current regime and sediment transport patterns associated with operational and maintenance activities that will alter seabed morphology in Wicklow Reef SAC or have any effects on the community composition characterising the Annex I reef habitats.

6.2.2.24 **Given the negligible likelihood of changes to physical processes in relation to operational and maintenance activities, there is no potential for AEoI from changes to physical processes on the Annex I reef habitat QIs of the Wicklow Reef SAC, as defined by the COs of the site, from Project Design Option 1.**

6.2.2.25 **Based on the representative risk of effect of Project Design Option 1, it is concluded that the conclusion of no AEoI would also apply to Project Design Option 2.**

6.2.3 Buckroney-Brittas Dunes and Fen SAC

6.2.3.1 The ~~conservation objectives~~COs for Buckroney-Brittas Dunes and Fen SAC is to maintain the favourable conservation conditions of annual vegetation of drift lines, Mediterranean salt meadows (*Juncetalia maritimi*), fixed coastal dunes with herbaceous vegetation (grey dunes), dunes with *Salix repens* ssp. *argentea* (*Silicion aremariae*) and Alkaline fens in Buckroney-Brittas Dunes and Fens SAC, and to restore the favourable conservation conditions of perennial vegetation of stony banks, embryonic shifting dunes, shifting dunes ~~alone~~along the shoreline with *Ammophila arenaria* (white dunes), Atlantic decalcified fixed dunes (*Calluno-Ulicetea*) and humid dune slacks in Buckroney-Brittas Dunes and Fen SAC. Table 5.1 lists these COs and their corresponding attributes and targets.

6.2.3.2 There are ~~two~~three potential impacts on the intertidal and subtidal benthic habitats associated with the construction, operational and maintenance and decommissioning of the Proposed Development, which are presented in Table 6.3, and are assessed below for each relevant phase of the Proposed Development.

ELEVATED LEVELS OF SUSPENDED SEDIMENT CONCENTRATIONS AND ASSOCIATED SEDIMENT DEPOSITION

CONSTRUCTION, OPERATIONAL AND DECOMMISSIONING

6.2.3.3 As determined in Table 6.3, Project Design Option 1 and Project Design Option 2 will have the same potential for adverse effects from elevated levels of suspended sediment and associated sediment deposition on coastal and intertidal benthic habitats.

6.2.3.4 It was identified at the Stage 1 SISAA (NIS Volume I: Supporting Information for Screening ~~Appraisal~~for Appropriate Assessment (Revised March 2026)) that the Proposed Development did not present any risk to maintaining the favourable conservation condition of the designated dune habitats with reference to conservation targets for 'Habitat area' or 'Distribution' as the Proposed Development would have no bearing whatsoever on whether or not the permanent area (or

distribution as the case may be) of dune habitat is stable or increasing, subject to natural processes.

6.2.3.5 The SAC supporting document (NPWS, 2017a) notes that these targets refer to activities or operations that proposed to permanently remove dune habitats, thus reducing the permanent amount of dune habitat (or range over which this habitat occurs as the case may be). Importantly, the targets do not refer to long- or short-term disturbance of the biology of ~~reef~~these habitats. On this basis, these conservation targets will not be undermined by the predicted increases in ~~suspended sediment concentrations~~SSCs during the construction phase of the Proposed Development.

6.2.3.6 Whilst implementing the Proposed Development at a distance of ~~0.31~~0.05 km from this coastal SAC is unlikely to jeopardise the conservation targets for habitat area, habitat distribution, vegetation structure and vegetation composition of its habitats, the targets for its sand dune habitats listed under 'Physical structure: functionality and sediment supply' are to maintain, or where necessary restore, the natural circulation of sediment and organic matter, without any physical obstructions.

6.2.3.7 Results of modelling discussed ~~above and in Volume III, Appendix 6.1: Marine Physical Processes Numerical Modelling of the NIS confirm that there is no potential for sediment plumes or associated sediment deposition to~~in Section 6.2.1 indicate that construction of the Proposed Development will not interrupt or physically obstruct the natural circulation of sediment and organic matter. In addition, with regard to the potential for suspended sediment and deposition, as modelled under various construction scenarios (see Figure 6.2 to Figure 6.11), it is considered highly unlikely that sediment plumes associated with offshore works would reach the Buckroney-Brittas Dunes and Fen SAC. However, installation works in the Cable Corridor and Working Area closer to the coastline may, in a limited scenario, result in a small amount of localised suspended sediment, with a minimal potential for sediment deposition at the foot of the dunes at the Magherabeg Dunes and Buckroney-Brittas Dunes and Fen SACs (see Section 6.2.1.43, Figure 6.10 and Figure 6.11). Any activities with potential for such deposition would be temporary and short-lived, and the material would be native to the site, being neutral to potentially beneficial in supporting the naturally accretive behaviour of the dune systems. These activities do not constitute a physical barrier to sediment transport processes. Therefore, the Proposed Development does not present a credible pathway for effects on the natural circulation of sediment and organic matter for sand dune habitats within Buckroney-Brittas Dunes and Fen SAC.

6.2.3.8 The Proposed Development will have no ~~bearing whatsoever on~~credible pathway for effect on the natural circulation of sediment and organic matter for sand dune habitats in Buckroney-Brittas Dunes and Fen SAC.

6.2.3.9 ~~6.2.3.8~~ **Therefore, it is concluded that there will be no AEoI on the Coastal Habitat QIs of the Buckroney-Brittas Dunes and Fen SAC, as defined by the COs of the site, as a result of suspended sediments and deposition effects for Project Design Option 1.**

6.2.3.10 ~~6.2.3.9~~ **Based on the ~~increased~~same potential risk of effect ~~of~~as Project Design Option 1, it is concluded that no AEoI on the Coastal Habitat QIs of the Buckroney-Brittas Dunes and Fen SAC would also apply to Project Design Option 2.**

ACCIDENTAL POLLUTION

CONSTRUCTION AND DECOMMISSIONING PHASE

6.2.3.11 ~~6.2.3.10~~ As determined in Table 6.3, Project Design Option 1 has a ~~greater~~marginally higher potential for adverse effects from accidental pollution on coastal and intertidal benthic habitats than Project Design Option 2.

6.2.3.12 ~~6.2.3.11 The installation~~The construction and decommissioning of the Proposed Development and confirmatory surveys may lead to the accidental release of pollutants through spills and leaks from vessels and equipment. The magnitude of the impact is dependent on the quantities of potential pollutants carried by vessels, helicopters, and equipment. Although many of the large vessels (e.g. installation vessels) may contain large quantities of diesel oil, any accidental spill from vessels, vehicles, machinery from construction activities would be subject to immediate dilution and rapid dispersal. In the unlikely event of an accidental spill or release of chemicals or materials, any resulting effects would be negligible and would not interfere with the COs of the site, which relate to habitat area, habitat distribution, physical structure and terrestrial vegetation.

6.2.3.13 ~~6.2.3.12~~ The avoidance of effect through design of the Proposed Development includes an Environmental Management Plan (EMP) and Marine Pollution Contingency Plan. Adherence to the avoidance by design measures outlined in Table 6.2 and good working practices will significantly reduce the likelihood of an accidental pollution incident occurring and the magnitude of its impact. Given the factored-in measures, the likelihood of accidental release is considered to be extremely low.

6.2.3.14 ~~6.2.3.13~~ There is also a ~~risk to reef~~potential impact to Annex I Coastal Habitats from water based drilling mud, including bentonite, which is used as a lubricant during the cable installation via trenchless techniques such as HDD and Direct pipe process. Trenchless techniques such as HDD and Direct pipe will be undertaken to install the offshore export cables at the landfall and potentially across the sandbank for inter-array cable installation. Drilling muds are used in a closed system to minimise loss to the environment; however, it is possible that muds (including bentonite) can break out during drilling operations, which may occur in intertidal or subtidal areas. Bentonite is ~~low toxicity~~a non-toxic, naturally occurring clay mineral used as a drilling mud and therefore the ~~risk to reefs~~potential effect to surrounding areas is minimal, particularly when considering that any break outs will be quickly diluted (seawater degrades the bentonite fluid, causing it to flocculate and allowing faster dispersal). However, any potential break outs or accidental spills of bentonite will be managed via good working practices (e.g. monitoring of mud volumes and pressure, detection of break outs and pausing drilling, plugging fissures and ongoing monitoring) such that any loss of bentonite to the environment is minimal and will not reach Annex I Coastal Habitats QIs.

6.2.3.15 ~~6.2.3.14~~ **Given the inherent low likelihood of accidental pollution from vessel activity, as well as the proposed avoidance/ impacts reduction measures (as set out in Table 6.2), and the low risk of pollution from cable installation via trenchless techniques such as HDD and Direct pipe, there is no potential for AEoI from accidental pollution on the Annex I Coastal Habitats of the Buckroney-Brittas Dunes and Fen SAC, as defined by the COs of the site, from Project Design Option 1.**

6.2.3.16 ~~6.2.3.15~~ **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

OPERATIONAL AND MAINTENANCE

6.2.3.17 ~~6.2.3.16~~ As determined in Table 6.3, Project Design Option 1 ~~and Option 2 have the same~~will have a marginally higher potential for adverse effects from accidental pollution on coastal and intertidal benthic habitats than Project Design Option 2.

6.2.3.18 ~~6.2.3.17~~ Operational and maintenance tasks within the Proposed Development may lead to the accidental release of pollutants through spills and leaks from vessels and equipment. The magnitude of the impact will be dependent on the quantities of potential pollutants carried by vessels, helicopters, and equipment. Although many of the large vessels (e.g. installation vessels) may contain large quantities of diesel oil, any accidental spill from vessels, vehicles, machinery or from construction, operational and maintenance and decommissioning activities would be subject to immediate dilution and rapid dispersal. In the unlikely event of an accidental spill or

release of chemicals or materials, any resulting effects would be negligible and would not interfere with the COs of the site, which relate to habitat area, habitat distribution, physical structure and terrestrial vegetation.

6.2.3.19 ~~6.2.3.18~~ Given the avoidance of effects by design, the likelihood of accidental release is considered to be extremely low. Adherence to the avoidance of effects by design outlined in Table 6.2 and good working practices will significantly reduce the likelihood of an accidental pollution incident occurring and the magnitude of its impact on ~~reefs~~Annex I Coastal Habitats.

6.2.3.20 ~~6.2.3.19~~ **Given the inherent low likelihood of accidental pollution from vessel activity, as well as the proposed avoidance/ impacts reduction measures (as set out in Table 6.2), ~~and the low risk of pollution from cable installation via trenchless techniques such as HDD and Direct pipe,~~ there is no potential for AEoI from accidental pollution ~~on~~during the operational and maintenance phase on the Annex I Coastal Habitats of the Buckroney-Brittas Dunes and Fen SAC, as defined by the COs of the site, from Project Design Option 1.**

6.2.3.21 **Based on the representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

CHANGES TO PHYSICAL PROCESSES

OPERATIONAL AND MAINTENANCE

6.2.3.22 The presence of offshore infrastructure during the operational and maintenance phase will have the potential to result in a localised blockage of waves and tides, which could lead to changes to seabed and coastal morphology. This blockage will commence when offshore construction begins, increasing incrementally until the array is installed in its entirety, which is outlined in Table 6.3.

6.2.3.23 As determined in Table 6.3, Project Design Option 1 is considered representative of Project Design Option 2 for the assessment of potential adverse effects from changes to physical processes on coastal and intertidal benthic habitats.

6.2.3.24 Although the Annex I Coastal Habitat QIs of Buckroney–Brittas Dunes and Fen SAC are located above the High Water Mark, they are directly and indirectly dependent on coastal sediment transport processes that are influenced by wave and tidal regimes. Buckroney–Brittas Dunes and Fen SAC support a sequence of dune habitats, including embryonic dunes, mobile dunes and fixed dunes, reflecting a gradient from highly dynamic coastal features to more stable inland habitats. In particular, the coastal dune systems are primarily maintained by wind-driven transport of sand from the beach to inland dune areas (Nordstrom, 2015). The COs relate to maintaining the natural circulation of sediment and organic matter, without any physical obstructions. Accordingly, these Annex I Coastal QIs are considered within this assessment pathway to address the potential for indirect effects arising from changes in sediment transport processes. At the screening stage, it was not possible to rule out such indirect effects, and therefore the habitats are carried forward for assessment on a precautionary basis. The COs for this SAC recognise that the structure and function of these dune systems are inherently linked to sediment availability and are maintained through natural cycles of accretion and erosion (Table 5.1).

6.2.3.25 The regional tidal regime in the vicinity of the Buckroney–Brittas Dunes and Fen SAC is characterised by currents that flow predominantly parallel to the coastline. The Array Area is located 6.8 to 15 km offshore and Array Area infrastructure is not predicted to materially influence alongshore or cross-shore sediment transport processes at the coastline.

6.2.3.26 A suite of project-specific numerical modelling simulations was undertaken in response to the RFIs (see NIS Volume III, Appendix 6.2: Arklow Bank Sediment Mobility Assessment (RFI March 2026) and NIS Volume III, Appendix: Arklow Bank - Quantitative Assessment of the Influence of

In-place Infrastructure on the Local Sediment Transport System (RFI March 2026)) with output indicating that any changes to hydrodynamics and sediment transport arising from the presence of offshore infrastructure are highly localised and confined to the immediate vicinity of the Array Area and its boundaries.

6.2.3.27 Potential wind wake effects from the WTGs are small in magnitude (typically less than 0.3 m/s) and only reach the coast under specific wind conditions (easterly winds). Given the infrequency of such conditions and the distance to shore, the impact of the Proposed Development on coastal wind regimes is considered marginal.

6.2.3.28 Importantly, the modelling demonstrates that no changes to wave climate, tidal regime, sediment transport pathways or seabed morphology are predicted to occur at the coastline or within designated Annex I Coastal Habitat sites. Predicted changes are not discernible beyond natural background variability in the physical environment (see Section 6.2.1).

6.2.3.29 In the absence of any predicted changes at the coastline and given the lack of any spatial or functional linkage between the Proposed Development and the Annex I Coastal Habitats with regard to marine physical processes, no adverse pathway of effect exists between changes to physical processes associated with the Proposed Development and the Annex I Coastal Habitats of Buckroney–Brittas Dunes and Fen SAC.

6.2.3.30 **Therefore, it is concluded that there will be no AEoI on the Coastal Habitat QIs of the Buckroney-Brittas Dunes and Fen SAC, as defined by the COs of the site, as a result of changes to physical processes during operational and maintenance phase, from Project Design Option 1.**

6.2.3.31 ~~6.2.3.20~~ **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

6.2.4 Magherabeg Dunes SAC

6.2.4.1 The ~~conservation objectives~~COs for Magherabeg Dunes SAC ~~is~~are to maintain the favourable conservation condition of Annual vegetation of drift lines, Embryonic shifting ~~dines~~dunes, Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes), Fixed coastal dunes with herbaceous vegetation (grey dunes) and Atlantic decalcified fixed dunes (*Calluno-Ulicetea*), and to restore the favourable conservation condition of Petrifying springs with tufa formation (Cratoneurion) within Magherabeg Dunes SAC. ~~These conservation objectives are defined in~~ Table 5.1 lists these COs and their corresponding attributes and targets.

6.2.4.2 There are ~~two~~three potential impacts on the dune habitats associated with the construction, operational and maintenance and decommissioning of the Proposed Development, which are presented in Table 6.3, and are assessed below for each relevant phase of the Proposed Development.

6.2.4.3 **The QI Atlantic decalcified fixed dunes (*Calluno-Ulicetea*) is primarily a terrestrial habitat which will fall outside the scope of works taking place within the Array Area and Cable Corridor and Working Area. Therefore, it is concluded that increases in suspended sediment and deposition ~~and~~, accidental pollution and changes to physical processes will have no AEoI on this Annex I Coastal QI of the Magherabeg Dune SAC from Project Design Option 1.**

6.2.4.4 **Based on the ~~increased~~representative potential risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

~~6.2.4.5 With consideration that the impact severity is based on distance from the site of works, Buckroney-Brittas Dunes and Fen SAC is designated for several of the same or similar QIs and is located nearer to the Proposed Development (0.31 km from the Proposed Development) than Magherabeg Dunes SAC (3.66 km from the Proposed Development), it was concluded that the~~

~~potential for AEoI is the same or reduced for this site. In Section 6.2.4 it has been concluded that none of the potential effects on intertidal and subtidal benthic habitats would result in an AEoI of the QIs.~~

6.2.4.5 The magnitude and severity of potential impacts to Annex I Coastal Habitats associated with the Proposed Development are expected to be related to proximity to the site of works for all identified impact pathways, namely:

- increased SSCs and associated deposition;
- accidental pollution; and
- changes to physical processes due to presence of operational infrastructure.

6.2.4.6 Buckroney-Brittas Dunes and Fen SAC is designated for several of the same or similar QIs and is located nearer to the Proposed Development (0.05 km) than Magherabeg Dunes SAC (3.44 km). In particular, the dune habitats at Magherabeg Dunes SAC are similar in structure and sediment dynamics to those at Buckroney-Brittas Dunes and Fen SAC, which are naturally dynamic systems that rely on the continuous supply and circulation of sand, without physical barriers, to maintain functionality and accretion (NPWS, 2017a). In Section 6.2.3, it has been concluded that none of the potential effects on intertidal and subtidal benthic habitats would result in an AEoI of the Annex I Coastal Habitat QIs of the Buckroney-Brittas Dunes and Fen SAC. On this basis, and in line with the relevant COs, it was concluded that the potential for AEoI for Annex I Coastal Habitat QIs is the same or reduced for Magherabeg Dunes SAC as it is for Buckroney-Brittas Dunes and Fen SAC.

6.2.4.7 As reported in Section 6.2.1 (see Figure 6.2 to Figure 6.11), it is considered highly unlikely that sediment plumes associated with offshore works would reach the Magherabeg Dunes SAC under the most precautionary scenario. Installation works within the Cable Corridor and Working Area closer to the coastline may, in a limited scenario, result in a small amount of localised suspended sediment, with a minimal potential for temporary sediment deposition at the foot of the dunes (see see Section 6.2.1.43, Figure 6.10 and Figure 6.11). Any activities with potential for such deposition would be temporary and short-lived, and the material would be native to the site, being neutral to potentially beneficial in supporting the naturally accretive behaviour of the dune systems. These activities do not constitute a physical barrier to sediment transport processes. Therefore, the Proposed Development does not present a credible pathway for effects on the natural circulation of sediment and organic matter for sand dune habitats.

6.2.4.8 Any accidental pollution, if it were to occur, would be minor, subject to rapid dispersal and dilution, and mitigated through the best practice measures outlined in Table 6.2. It is therefore not anticipated to reach or affect any Annex I Coastal Habitat QIs.

6.2.4.9 The morphodynamic modelling presented in Section 6.2.1 (paragraphs 6.2.1.49 to 6.2.1.60) indicates that that no changes to wave climate, tidal regime, sediment transport pathways or seabed morphology are predicted to occur at the coastline or within designated Annex I Coastal Habitat QIs, therefore, no adverse impact pathway exists for changes to physical processes.

6.2.4.10 ~~6.2.4.6~~ **Therefore, ~~there is~~ no AEoI ~~for~~of the Annex I Coastal Habitat QIs of Magherabeg Dunes SAC, as defined by the COs of the site, are identified as a result of any of the impacts considered above affecting intertidal and subtidal benthic habitats from Project Design Option 1.**

6.2.4.11 ~~6.2.4.7~~ **Based on the ~~increased~~representative potential risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

6.2.5 Kilpatrick Sandhills SAC

6.2.5.1 The ~~conservation objectives~~COs for Kilpatrick Sandhills SAC are to maintain the favourable conservation conditions of annual vegetation of drift lines, and to restore the favourable

conservation conditions of embryonic shifting dunes, shifting dunes along the shoreline with *Ammophila arenaria* (white dunes), fixed coastal dunes with herbaceous vegetation (grey dunes), and Atlantic decalcified fixed dunes (*Calluno-Ulicetea*) in Kilpatrick Sandhills SAC. Table 5.1 lists these COs and their corresponding attributes and targets.

6.2.5.2 There are ~~two~~three potential impacts on the intertidal and subtidal benthic habitats associated with the construction, operational and maintenance and decommissioning of the Proposed Development, which are presented in Table 6.3 and are assessed below ~~for each phase of the Proposed Development~~.

6.2.5.3 The QI Atlantic decalcified fixed dunes (*Calluno-Ulicetea*) is primarily a terrestrial habitat which will fall outside the scope of works taking place within the Array Area and Cable Corridor and Working Area. **Therefore, it is concluded that increases in suspended sediment and deposition ~~and~~, accidental pollution and changes in physical processes will have no AEoI on this ~~QI~~on this Annex I Coastal Habitat QI of the Kilpatrick Sandhills SAC from Project Design Option 1.**

6.2.5.4 **Based on the representative potential risk of effect of Project Design Option 1, it is concluded that no AEoI on this Annex I Coastal Habitat QI of the Kilpatrick Sandhills SAC would also apply to Project Design Option 2.**

6.2.5.5 The magnitude of potential impacts is influenced by SAC location and distance from the site of works for all three potential impact pathways to Annex I Coastal Habitats, namely:

- increased SSCs and associated deposition;
- accidental pollution; and
- changes to physical processes due to presence of operational infrastructure.

6.2.5.6 ~~6.2.5.4 With consideration that the impact severity is based on distance from the site of works, Magherabeg~~Buckroney-Brittas Dunes and Fen SAC is designated for several of the same or similar QIs and is located nearer to the Proposed Development (~~3.66~~0.05 km ~~from the Proposed Development~~) than Kilpatrick Sandhills SAC (~~6.86~~.80 km ~~from the Proposed Development), it was concluded that~~). Given the greater distance of Kilpatrick Sandhills SAC, the potential for AEoI ~~is~~of Annex I Coastal Habitat QIs at Kilpatrick Sandhills SAC is considered the same ~~or reduced for this site~~as, or less than, that for Buckroney-Brittas Dunes and Fen SAC. In Section ~~6.2.4~~ 6.2.3, it has been concluded that none of the potential effects on intertidal and subtidal benthic habitats would result in an AEoI of the QIs.

6.2.5.7 In addition, as reported in Section 6.2.1 (see Figure 6.2 to Figure 6.11), it is not anticipated that sediment plumes will extend to The Kilpatrick Sandhills SAC under the most precautionary scenario, where no impact pathways exist for increased SSCs and associated deposition. Any accidental pollution, if it were to occur, would be minor, subject to rapid dispersal and dilution, and mitigated through the best practice measures outlined in Table 6.2. It is therefore not anticipated to reach or affect any Annex I Coastal Habitat QIs. The morphodynamic modelling presented in Section 6.2.1 (paragraphs 6.2.1.49 to 6.2.1.60) indicates that that no changes to wave climate, tidal regime, sediment transport pathways or seabed morphology are predicted to occur at the coastline or within designated Annex I Coastal Habitat QIs, therefore, no adverse impact pathway exists for changes to physical processes.

6.2.5.8 ~~6.2.5.5~~ **Therefore, ~~there is~~ no AEoI ~~for~~of the Annex I Coastal Habitat QIs of Kilpatrick Sandhills SAC, as defined by the COs of the site, are identified as a result of any of the impacts considered above affecting intertidal and subtidal benthic habitats from Project Design Option 1.**

6.2.5.9 ~~6.2.5.6~~ **Based on the ~~increased~~representative potential risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

6.2.6 The Murrough Wetlands SAC

6.2.6.1 The ~~conservation objectives~~COs for The Murrough Wetlands SAC are to restore the favourable conservation condition of annual vegetation of drift lines, perennial vegetation of stony banks, Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*), Mediterranean salt meadows (*Juncetalia maritimi*), Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae* and Alkaline fens in The Murrough Wetlands SAC. Table 5.1 lists these COs and their corresponding attributes and targets.

6.2.6.2 There are ~~two~~three potential impacts on the intertidal and subtidal benthic habitats associated with the construction, operational and maintenance and decommissioning of the Proposed Development, which are presented in Table 6.3 and are assessed below ~~for each phase of the Proposed Development~~.

6.2.6.3 The magnitude of potential impacts is influenced by distance from the site of works for all three potential impact pathways to Annex I Coastal Habitats, namely:

- increased SSCs and associated deposition;
- accidental pollution; and
- changes to physical processes due to presence of operational infrastructure.

6.2.6.4 ~~6.2.6.3 With consideration that the impact severity is based on distance from the site of works, Magherabeg~~Buckroney-Brittas Dunes and Fen SAC is designated for several of the same or similar QIs and is located nearer to the Proposed Development (~~3.66~~0.05 km from the Proposed Development) than The Murrough Wetlands SAC (~~11.15~~10.25 km from the Proposed Development)~~, it was concluded that~~. On this basis, the potential for AEoI ~~is~~of Annex I Coastal Habitat QIs at The Murrough Wetlands SAC is considered to be the same ~~or reduced for this site~~as, or less than, that for Buckroney-Brittas Dunes and Fen SAC. In Section ~~6.2.4~~ 6.2.3, it has been concluded that none of the potential effects on intertidal and subtidal benthic habitats would result in an AEoI of the QIs.

6.2.6.5 In addition, as reported in Section 6.2.1 (see Figure 6.2 to Figure 6.11), it is not anticipated that sediment plumes will extend to The Murrough Wetlands SAC under the most precautionary scenario, where no impact pathways exist for increased SSCs and associated deposition. Any accidental pollution, if it were to occur, would be minor, subject to rapid dispersal and dilution, and mitigated through the best practice measures outlined in Table 6.2. It is therefore not anticipated to reach or affect any Annex I Coastal Habitat QIs. The morphodynamic modelling presented in Section 6.2.1 (paragraphs 6.2.1.49 to 6.2.1.60) indicates that that no changes to wave climate, tidal regime, sediment transport pathways or seabed morphology are predicted to occur at the coastline or within designated Annex I Coastal Habitat QIs, therefore, no adverse impact pathway exists for changes to physical processes.

6.2.6.6 ~~6.2.6.4~~ **Therefore, ~~there is~~ no AEoI ~~for The~~of the Annex I Coastal Habitat QIs of The Murrough Wetlands SAC, as defined by the COs of the site, are identified as a result of any of the impacts considered above affecting intertidal and subtidal benthic habitats from Project Design Option 1.**

6.2.6.7 ~~6.2.6.5~~ **Based on the ~~increased~~representative potential risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

6.2.7 Cahore Polders and Dunes SAC

6.2.7.1 The ~~conservation objectives~~COs for Cahore Polders and Dunes SAC are to restore the conservation conditions of annual vegetation of drift lines, Embryonic shifting dunes, shifting dunes along the shoreline with *Ammophila arenaria* (white dunes), fixed coastal dunes with herbaceous vegetation (grey dunes) and humid dune slacks. Table 5.1 lists these COs and their corresponding attributes and targets.

6.2.7.2 There are ~~two~~three potential impacts on the intertidal and subtidal benthic habitats associated with the construction, operational and maintenance and decommissioning of the Proposed Development, which are presented in Table 6.3 and are assessed below ~~for each phase of the Proposed Development~~.

6.2.7.3 The magnitude of potential impacts is influenced by distance from the site of works for all three potential impact pathways to Annex I Coastal Habitats, namely:

- increased SSCs and associated deposition;
- accidental pollution; and
- changes to physical processes due to presence of operational infrastructure.

6.2.7.4 ~~6.2.7.3 With consideration that the impact severity is based on distance from the site of works, Magherabeg~~Buckroney-Brittas Dunes and Fen SAC is designated for several of the same or similar QIs and is located nearer to the Proposed Development (~~3.66~~0.05 km from the Proposed Development) than Cahore Polders and Dunes SAC (18.19 km from the Proposed Development)~~, it was concluded that~~. On this basis, the potential for AEoI ~~is~~of Annex I Coastal Habitat QIs at Cahore Polders and Dunes SAC is considered the same, or ~~reduced for this site~~less than, that for Buckroney-Brittas Dunes and Fen SAC. In Section ~~6.2.4~~ 6.2.3, it has been concluded that none of the potential effects on intertidal and subtidal benthic habitats would result in an AEoI of the QIs.

6.2.7.5 In addition, as reported in Section 6.2.1 (see Figure 6.2 to Figure 6.11), it is not anticipated that sediment plumes will extend to the Cahore Polders and Dunes SAC under the most precautionary scenario, where no impact pathways exist for increased SSCs and associated deposition. Any accidental pollution, if it were to occur, would be minor, subject to rapid dispersal and dilution, and mitigated through the best practice measures outlined in Table 6.2. It is therefore not anticipated to reach or affect any Annex I Coastal Habitat QIs. The morphodynamic modelling presented in Section 6.2.1 (paragraphs 6.2.1.49 to 6.2.1.60) indicates that that no changes to wave climate, tidal regime, sediment transport pathways or seabed morphology are predicted to occur at the coastline or within designated Annex I Coastal Habitat QIs, therefore, no adverse impact pathway exists for changes to physical processes.

6.2.7.6 ~~6.2.7.4~~ **Therefore, ~~there is~~ no AEoI ~~for~~of the Annex I Coastal Habitat QIs of Cahore Polders and Dunes SAC, as defined by the COs of the site, are identified as a result of any of the impacts considered above affecting intertidal and subtidal benthic habitats from Project Design Option 1.**

6.2.7.7 ~~6.2.7.5~~ **Based on the ~~increased~~representative potential risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

6.2.8 Blackwater Bank SAC

6.2.8.1 The ~~conservation objectives~~COs for Blackwater Bank SAC are to maintain the favourable conservation conditions of sandbanks which are slightly covered by sea water all the time in Blackwater Bank SAC. Table 5.1 lists the COs and their corresponding attributes and targets.

6.2.8.2 There are ~~two~~three potential impacts on the intertidal and subtidal benthic habitats associated with the construction, operational and maintenance and decommissioning of the Proposed Development, which are ~~presented~~detailed in Table 6.3 and ~~are~~ assessed ~~below~~ for each phase of the ~~Proposed~~ development~~.~~:

~~6.2.8.3 With consideration that the impact severity is based on distance from the site of works, Magherabeg Dunes SAC is designated for several of the same or similar QIs and is located nearer to the Proposed Development (3.66 km from the Proposed Development) than Blackwater Bank SAC (19.76 km from the Proposed Development), it was concluded that the potential for AEoI is the~~

~~same or reduced for this site. In Section 6.2.4 it has been concluded that none of the potential effects on intertidal and subtidal benthic habitats would result in an AEoI of the QIs.~~

- Elevated levels of SSCs and associated sediment deposition;
- Accidental release of pollutants; and
- Changes to physical processes.

6.2.8.3 With consideration that the magnitude of potential impacts is influenced by distance from the site of works for all three potential impact pathways to Annex I Habitats, and that, as reported in Section 6.2.1 (see Figure 6.2 to Figure 6.11), it is not anticipated that sediment plumes will extend to the Blackwater Bank SAC under the most precautionary scenario, no impact pathways exist for increased SSCs and associated deposition. Any accidental pollution would be minor, subject to rapid dispersal and dilution and would be mitigated through the best practice measures outlined in Table 6.2. As such, no impact pathway exists for accidental pollution. The morphodynamic modelling presented in Section 6.2.1 (paragraphs 6.2.1.49 to 6.2.1.60) indicates that there will be no changes to the nearshore wave climate, and sediment transport processes that support nearby designated sites will remain unaffected; therefore, no adverse impact pathway exists for changes to physical processes.

6.2.8.4 **Therefore, ~~there is~~ no AEoI ~~for~~of the Annex I Marine Habitat QIs of Blackwater Bank SAC, as defined by the COs of the site, are identified as a result of any of the impacts considered above affecting intertidal and subtidal benthic habitats from Project Design Option 1.**

6.2.8.5 **Based on the ~~increased~~representative potential risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

6.2.9 Summary of Stage 2 Appraisal for Sites Screened in for Annex I Coastal and Marine Habitat QIs

6.2.9.1 ~~Two~~Three potential impacts were assessed for impacts on Annex I Coastal and Marine Habitats resulting from construction, operational and maintenance and decommissioning of the Proposed Development, the results of this assessment can be seen in Table 6.4.

Table 6.4: Conclusion for the assessment of potential impacts on Sites Screened in for Annex I Coastal and Marine Habitat QIs

Potential impact	Differences between Project Design Option 1 and 2	Conclusion
Elevated levels of ~~suspended sediment concentrations~~SSCs and associated ~~sediment~~ deposition	For Project Design Option 1, there is a higher number of monopile foundations requiring installation however, there is not anticipated to be a higher risk of elevated levels of ~~suspended sediment concentrations~~SSCs and associated ~~sediment~~ deposition for Project Design Option 2. Therefore, Project Design Option 1 is considered representative of Project Design Option 2 in respect to elevated SSCs and associated deposition.	~~As both options present~~The suspended sediment plumes ~~that will disperse a significant distance outside all SAC boundaries, a conclusion of no AEoI is applicable to both~~associated with Project Design Option 1 and ~~2 for all SACs for increased suspended sediment concentrations~~Project Design Option 2 are predicted to disperse out with all SAC boundaries. It is concluded that neither Project Design Option would result in an AEoI for any SAC in relation to increased SSCs and associated ~~sediment~~ deposition.
Accidental release of pollutants	For Project Design Option 1, there is a slightly higher number of monopile foundations requiring ~~installation~~construction, operational and maintenance and decommissioning activities and therefore, there is a	As both Project Design Option 1 and 2 present avoidance by design and management measures which will be implemented to reduce the likelihood of accidental pollution events, ~~a conclusion of~~it is concluded that no AEoI ~~is~~

Potential impact	Differences between Project Design Option 1 and 2	Conclusion
	marginally higher risk of accidental pollution. Both Project Design options consider the same Factored in Measures (Table 6.2). Therefore, Project Design Option 1 is considered conservatively representative of Project Design Option 2 in respect to potential for accidental pollution.	~~applicable~~would occur for any SAC for both Project Design Option 1 and 2 ~~for all SACs for~~in relation to accidental pollution.
Changes to physical processes	Project Design Option 1 consists of a larger number of foundations to be installed – 55 monopile foundations in total (53 for WTGs and 2 for OSPs), whilst Project Design Option 2 comprises of 49 foundations in total (47 for WTGs and 2 for OSPs). Therefore, Project Design Option 1 is considered representative of Project Design Option 2 for assessing potential influences on habitat change in relation to tidal currents, wave climate, sediment transport and seabed morphology.	As both Project Design Option 1 and Project Design Option 2 are considered to have no measurable effect on the any of the SACs considered for Annex I Coastal or Marine Habitats, a conclusion of no AEoI is applicable for both Project Design Options for changes to physical processes

6.3 Baseline information to inform Stage 2 AA for Annex II Marine Mammal Species QIs

6.3.1.1 As outlined in Section 5.1, ~~the following designated sites have continued through the Stage 1 Screening Assessment to be assessed in Stage 2 as a likely significant effect~~40 European sites with corresponding Annex II marine mammal QIs have been screened in for Stage 2 AA, as a LSE could not be ruled out at Stage 1 (NIS Volume I: Supporting Information for Screening for Appropriate Assessment (Revised March 2026)). These sites are presented in Figure 6.~~4~~12Figure 6.~~4~~12 and comprise SACs designated for harbour porpoise (*Phocoena phocoena*), bottlenose dolphin (*Tursiops truncatus*), grey seal (*Halichoerus grypus*), and harbour seal (*Phoca vitulina*).

6.3.1.2 The boundary for the Proposed Development does not overlap any designated sites with marine mammal QIs, with the closest site comprising Blackwater Bank SAC, located approximately 19.13 km from the Proposed Development. However, given the high mobility of Annex II marine mammal species and their use of wide-ranging marine habitats beyond SAC boundaries, functional connectivity between the Proposed Development area and designated sites cannot be excluded. On this basis, the following SACs have been taken forward for assessment at Stage 2:

- Within Ireland:
  - Blackwater Bank SAC – harbour porpoise;
  - ~~Slaney River Valley SAC – harbour seal;~~
  - ~~Lambay~~Rockabill to Dalkey Island SAC – ~~grey seal and~~ harbour porpoise;
  - Codling Fault Zone SAC – harbour porpoise;
  - ~~Rockabill to Dalkey Island~~Slaney River Valley SAC – harbour ~~porpoise~~seal;
  - Carnsore Point SAC – harbour porpoise;

- Lambay Island SAC – grey seal and harbour porpoise;
- Saltee Islands SAC – grey seal;
- Hook Head SAC - harbour porpoise and bottlenose dolphin;
- Roaringwater Bay and Islands SAC – harbour porpoise;
- Kenmare River SAC – harbour porpoise;
- Blasket Islands SAC – harbour porpoise;
- Belgica Mound Province SAC – harbour porpoise;
- Bunduff Lough and Machair / Trawalua / Mullaghmore SAC – harbour porpoise;
- Inishmore Island SAC – harbour porpoise and bottlenose dolphin;
- Kilkieran Bay and Islands SAC – harbour porpoise; and
- West Connacht Coast SAC – harbour porpoise~~;~~.

- Transboundary sites within the UK:
  - West Wales Marine / Gorllewin Cymru Forol SAC – harbour porpoise;
  - North Anglesey Marine / Gogledd Môn Forol SAC – harbour porpoise;
  - Lleyn Peninsula and the Sarnau / Pen Llyn a'r Sarnau SAC – grey seal and bottlenose dolphin;
  - Cardigan Bay / Bae Ceredigion SAC – grey seal and bottlenose dolphin;
  - Pembrokeshire Marine / Sir Benfro Forol SAC – grey seal;
  - North Channel SAC – harbour porpoise; and
  - Bristol Channel Approaches / Dynesfeydd Môr Hafren SAC – harbour porpoise~~;~~.

  ~~– North Channel SAC – harbour porpoise;~~

- Transboundary sites within mainland Europe:
  - ~~Nord Bretagne DH (FR)~~Abers – Côtes des legends – harbour porpoise;
  - ~~Récifs et Lands de la Hague (FR) SAC~~Nord Bretagne DH – harbour porpoise;
  - ~~Anse~~Baie de ~~Vauville (FR) SAC~~Morlaix – harbour porpoise;
  - ~~Mers Celtiques – Talus du golfe de Gascogne (FR) SAC~~Ouessant-Molène – harbour porpoise;
  - ~~Tregor Goëlo (FR) SAC~~Côte de Granit rose-Sept-Iles – harbour porpoise;
  - ~~Banc et récifs~~Côtes de ~~Surtainville (FR) SAC~~Crozon – harbour porpoise;
  - ~~Baie~~Chaussée de ~~Morlaix (FR) SAC~~Sein – harbour porpoise;
  - ~~Ouessant-Molène (FR) SAC~~Tregor Goëlo – harbour porpoise;
  - ~~Cap d'Erquy-Cap Fréhel (FR) SAC~~Mers Celtiques – Talus du golfe de Gascogne – harbour porpoise;
  - ~~Chausey (FR) SAC~~Récifs et Lands de la Hague – harbour porpoise;
  - ~~Côte~~Baie de ~~Granit rose-Sept-Iles (FR) SAC~~Saint-Brieuc – Est – harbour porpoise;

  ~~– Abers – Côtes des legends (FR) SAC – harbour porpoise;~~

  - ~~Côtes~~Anse de ~~Crozon (FR) SAC~~Vauville – harbour porpoise;
  - ~~Baie de Saint-Brieuc – Est (FR) SAC~~Cap d'Erquy-Cap Fréhel – harbour porpoise;
  - ~~Chaussée~~Banc et récifs de ~~Sein (FR) SAC~~Surtainville – harbour porpoise;
  - Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard ~~(FR) SAC –~~ harbour porpoise;
  - ~~Baie du Mont Saint-Michel (FR) SAC~~Chausey – harbour porpoise~~; and~~
  - Estuaire de le Rance ~~(FR) SAC –~~ harbour porpoise~~.~~; and

~~6.3.1.2 The boundary for the Proposed Development does not overlap any of these designated sites, with the closest site comprising Blackwater Bank SAC at 19.76 km from the Proposed Development. All marine mammal species are highly mobile and so despite distance the above sites have been screened in due to potential LSE on the qualifying features caused by the Proposed Development.~~

~~The Stage 1 SISAA concluded that there was potential for LSE via underwater noise, vessel collision and changes in prey for harbour porpoise, bottlenose dolphin, harbour seal and grey seal, and EMF for harbour porpoise and bottlenose dolphin.~~

– Baie du Mont Saint-Michel – harbour porpoise.

6.3.1.3 NIS Volume I: Supporting Information for Screening for Appropriate Assessment (Revised March 2026) identified a number of pathways by which the Proposed Development construction, operational and maintenance and decommissioning activities could potentially result in LSE on Annex II marine mammal QIs of the SACs, which could not be excluded from further consideration on a precautionary basis (Table 5.1). Given the high mobility of marine mammals and their sensitivity to anthropogenic pressures, potential effects may occur through both direct interaction with project activities and indirect pathways, including changes to prey availability or habitat use.

6.3.1.4 ~~6.3.1.3~~ Underwater noise will be ~~produced~~generated by the Proposed Development primarily through piling activities ~~and geophysical surveys, with~~during construction, with additional contributions from UXO clearance, confirmatory site surveys, other seabed disturbance activities (i.e. dredging and trenching), and increased vessel movements ~~also partly contributing to the LSE potential from underwater noise~~. Underwater noise ~~from piling and other activities can~~has the potential to result in ~~individuals suffering~~ physical injury, ~~hearing~~auditory damage and behavioural effects (including disturbance or displacement), and represents a key pathway by which the Proposed Development may interact with Annex II marine mammal species.

6.3.1.5 ~~6.3.1.4 The~~ Potential ~~for LSE~~injury from vessel ~~collision~~activities is associated with ~~the movements of vessels for~~ construction, operational and maintenance, and decommissioning ~~activities, where the vessel pose a risk of injury or death to the marine mammals through physical collision, typically with the propeller.~~of the Proposed Development, which will involve increased vessel movements within the wider area and may increase the likelihood of interaction between vessels and marine mammals.

6.3.1.6 ~~6.3.1.5~~ There is potential for ~~LSE from an~~ accidental release of pollutants to occur from vessels and equipment associated with the construction, operational and maintenance and decommissioning phases of the Proposed Development, which ~~may~~could result in adverse effects on marine mammals. Pollutants may include diesel fuel, bentonite (from drilling activities), lubricants, grease and oils, anti-fouling biocides, and grout.

6.3.1.7 EMF associated with subsea export, inter-array and interconnector cables may be generated during the operational and maintenance phase of the Proposed Development. EMF is considered as a potential pressure pathway for Annex II cetaceans species, reflecting ongoing scientific discussion regarding the ability of some cetaceans to detect variations in magnetic fields (Normandeau *et al.,* 2011). While evidence of population-level effects remains limited, this pathway is retained on a precautionary basis for cetaceans and is not considered a relevant pressure pathway for Annex II seal species (Hanke *et al.*, 2013). Further justification and detail supporting species-specific marine mammal sensitivities for EMF is provided in Section 6.3.3 of the NIS Volume I: Supporting Information for Screening for Appropriate Assessment (Revised March 2026).

6.3.1.8 Indirect effects on marine mammals may occur as a result of changes in prey species distribution and abundance, potentially arising from underwater noise, vessel activity, EMF, accidental pollution or deterioration in habitat or water quality.

6.3.1.9 Overall, for the Annex II marine mammal QIs screened into the NIS, the following potential impact pathways are considered in relation to the COs of the relevant SACs and are evaluated through detailed Stage 2 assessment, either alone (Section 6.4) or in-combination (Section 7.4.2):

~~6.3.1.6 EMF induced effects (e.g. effects on navigation and other life-history dependant functions) may occur during the operational and maintenance phase of the Proposed Development if individuals are located within close proximity to the cabling.~~

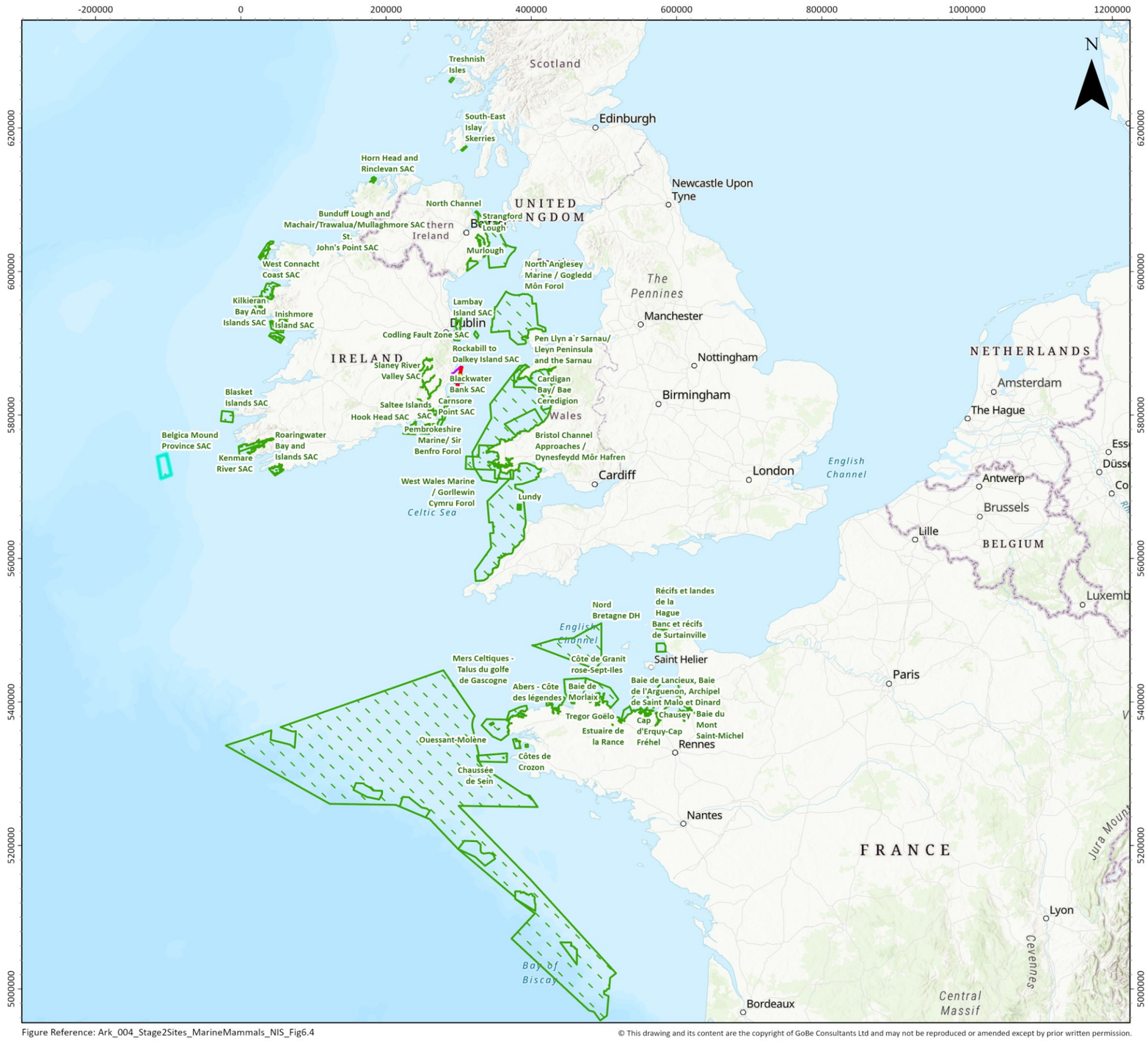
~~6.3.1.7 Changes in prey can comprise a change in species distribution and abundance and may be caused by accidental pollution and/ or an ensonified underwater noise environment and/ or as a result of increased collision risk with vessels and/ or prey species may be impacted by EMF induced effects.~~

~~6.3.1.8 Overall, the following impacts are therefore considered, with consideration of the COs of the qualifying interests of these SACs:~~

- Underwater noise from piling activities;
- Underwater noise from other activities (including UXO clearance, site surveys, dredging and trenching, and vessels);
- Injury from vessel ~~collision~~activities;
- Accidental pollution;
- EMF (only for sites with harbour porpoise and bottlenose dolphin ~~features~~QIs); and

~~• Accidental pollution; and~~

- Changes in prey.



sse Renewables

Arklow Bank Wind Park 2

Sites Assessed at Stage 2 (AA) for Marine Mammals

Legend

- ABWP2 Array Area
- ABWP2 Cable Corridor and Working Area
- ABWP1 WTGs
- ABWP1 Existing Met Mast
- ABWP1 Existing Export Cable
- ABWP1 Array Area
- Special Area of Conservation



Notes

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Coordinate System:
ETRS 1989 UTM Zone 30N

0 100 200 km

0 50 100 nm

Scale	Date	Drawn By	Checked By	Approved By
1:5,086,263 @ A3	09/04/2024	GB	EM	LK

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Figure Number 6.4

Figure Reference: Ark_004_Stage2Sites_MarineMammals_NIS_Fig6.4

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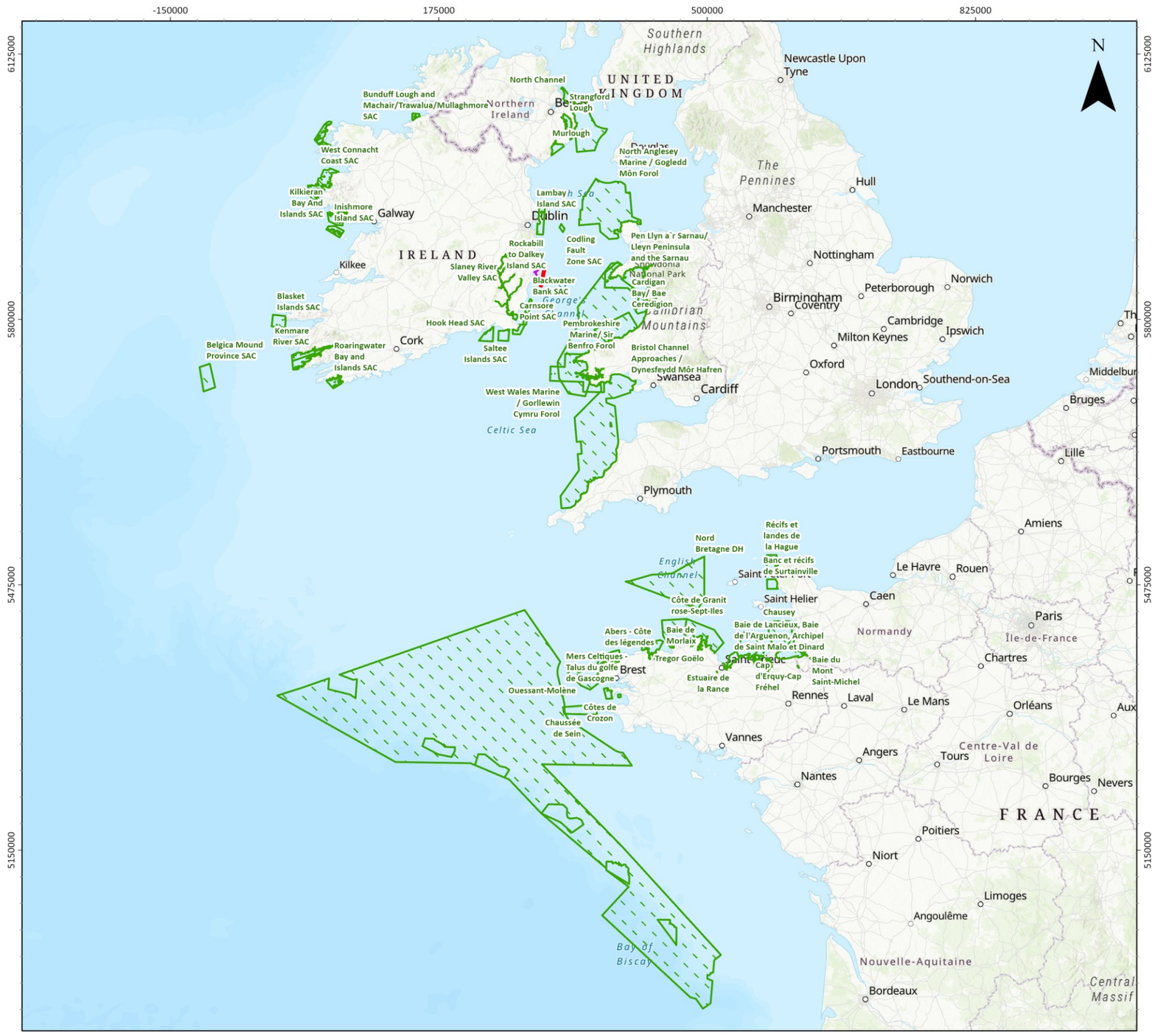

Figure Reference: Ark_Fig6.12_StageTwoSites_MarineMammals

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sse Renewables

Arklow Bank Wind Park 2

Sites Assessed at Stage 2 (AA) for Annex II Marine Mammals

Legend

- ABWP2 Array Area
- ABWP2 Cable Corridor and Working Area
- Special Area of Conservation (SAC)



Notes

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Coordinate System:
ETRS 1989 UTM Zone 30N

0 90 180 km

0 40 80 nm

Scale	Date	Drawn By	Checked By	Approved By
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Figure 6.412: Sites assessed at Stage 2 AA for Marine Mammals

6.3.2 ~~6.3.1~~ Baseline Environment

Site-specific surveys summary

~~6.3.1.1 A summary of the site-specific surveys undertaken to inform the Stage 2 AA on marine mammals is provided in Table 6.5.~~

6.3.2.1 The marine mammal baseline for the Proposed Development is informed by a comprehensive body of existing and site-specific survey data. A summary of the site-specific surveys used to inform the Annex II marine mammal baseline for this NIS is provided in Table 6.5. Detailed survey methodologies are presented in the monitoring reports referenced therein and in the Marine Mammal Technical Report (NIS Volume III, Appendix 11.2: Marine Mammal Technical Report (Revised March 2026)).

6.3.2.2 The baseline evidence includes historical boat-based visual surveys (2000-2009), a Passive Acoustic Monitoring (PAM) campaign (2002), and multiple phases of Digital Aerial Surveys (DAS; 2018 to 2020), together with Marine Mammal Observer (MMO) records collected during geophysical and geotechnical campaigns (2019 to 2020). These data underpin the characterisation of marine mammal presence, distribution, and relative abundance within and surrounding the Proposed Development area.

6.3.2.3 Since submission of the planning application in June 2024, additional site-specific data have since been collected to support updates to the EIAR and NIS in response to RFIs 9c and 9d. These include extended DAS covering during 2023 to 2025, and targeted land-based seal vantage point surveys undertaken between June to November 2025 to address limitations in aerial survey coverage of seal haul-out sites (Table 6.5). Additional nearshore and offshore geotechnical survey campaigns were undertaken in 2023 and 2024 including MMO coverage, with sighting reported by Gavin & Doherty Geosolutions Ltd (2023a; 2023b), Mizen Archaeology (2024) and XOcean (2024; Table 6.5).

Table 6.5: Summary of site-specific survey data for Marine Mammals

Data source	Overview of survey	Survey contractor	Date(s) of survey	Reference to further information
Acoustic monitoring	Static acoustic data logger	Coveney Wildlife Consulting Ltd (CWC)	August to September 2002	Coveney Wildlife Consulting Ltd (CWC) (2002); Appended to ~~EIAR~~NIS Volume III, Appendix 11.2: Marine Mammal Technical Report (Revised March 2026).
Historical boat-based visual survey	Visual boat-based survey	CWC	July 2000 to June 2005	CWC (2003; 2004; 2005); Appended to ~~EIAR~~NIS Volume III, Appendix 11.2: Marine Mammals Technical Report (Revised March 2026).
Historical boat-based visual survey	Visual boat-based survey	Fulmar Ecological Services	July 2005 to June 2006	Fulmar Ecological Services (2006); Appended to ~~EIAR~~NIS Volume III, Appendix 11.2: Marine Mammals Technical Report (Revised March 2026).
Historical boat-based visual survey	Visual boat-based survey	Cork Ecology	July 2006 to June 2009	Cork Ecology (2007; 2009; 2010); Appended to ~~EIAR~~NIS Volume III, Appendix 11.2: Marine Mammals Technical Report (Revised March 2026).

Data source	Overview of survey	Survey contractor	Date(s) of survey	Reference to further information
Baseline digital aerial survey (DAS)	DAS	HiDef Aerial Surveying Limited	March 2018 to February 2020 (excluding April 2019 plus April 2020)	HiDef (2020a; ~~b~~2020b); Appended to ~~EIAR~~NIS Volume III, Appendix 11.2: Marine Mammals Technical Report (Revised March 2026).
Baseline DAS	DAS	HiDef Aerial Surveying Limited	August 2023 to June 2024	NIS Volume III, Appendix 11.2: Marine Mammals Technical Report (Revised March 2026).
Baseline DAS	DAS	HiDef Aerial Surveying Limited	February 2025 to July 2025	NIS Volume III, Appendix 11.2: Marine Mammals Technical Report (Revised March 2026).
Marine Mammal Observer (MMO) Daily sightings data	Boat-based sightings during mitigation for geophysical survey campaign	Irish Whale and Dolphin Group (IWDG) Consulting	July to August 2019	IWDG Consulting (2019); Appended to ~~EIAR~~NIS Volume III Appendix 11.2: Marine Mammals Technical Report (Revised March 2026).
MMO Daily sightings data	Boat-based sightings during mitigation for geophysical survey campaign	Gavin & Doherty Geosolutions Ltd	July to August 2020	Gavin & Doherty Geosolutions Ltd (2020a); Appended to ~~EIAR~~NIS Volume III, Appendix 11.2: Marine Mammals Technical Report (Revised March 2026).
MMO Daily sightings data	Boat-based sightings during mitigation for ~~geophysical~~geo technical survey campaign	Gavin & Doherty Geosolutions Ltd	October to November 2020	Gavin & Doherty Geosolutions Ltd (2020b); Appended to ~~EIAR~~NIS Volume III, Appendix 11.2: Marine Mammals Technical Report (Revised March 2026).
MMO Daily sightings data	Boat-based sightings during mitigation for geotechnical nearshore and offshore survey campaigns	Gavin & Doherty Geosolutions Ltd	July to August 2023	Gavin & Doherty Geosolutions Ltd (2023a; ~~b~~2023b); Appended to ~~EIAR~~NIS Volume III, Appendix 11.2: Marine Mammals Technical Report (Revised March 2026).
MMO Daily sightings data	Boat-based sightings during mitigation for survey campaigns	Mizen Archaeology and XOcean	June to August 2024	Mizen Archaeology, (2024); XOcean, (2024); Appended to NIS Volume III, Appendix 11.2: Marine Mammals Technical Report (Revised March 2026).
Seal Vantage Point (VP) surveys	Land-based surveys from vantage points overlooking the proposed landfall and the	APEM Group	June 2025 to November 2025	NIS Volume III, Appendix 11.4: Seal Survey – 2025 Survey Report (RFI March 2026); NIS Volume III, Appendix 11.2: Marine Mammals Technical Report (Revised March 2026).

Data source	Overview of survey	Survey contractor	Date(s) of survey	Reference to further information
	surrounding 500 m buffer zone			

~~Boat-based visual surveys (historical)~~

~~6.3.1.2 These surveys were carried out as part of the marine mammal monitoring programme to support Arklow Bank Wind Park (ABWP1). They focused on three survey areas comprising: the Foreshore Lease Area, a 5 km wide survey area surrounding the bank and a survey area encompassing the whole of the ABWP1 cable route leading from the western edge of the bank area to the shore.~~

~~6.3.1.3 Monitoring surveys were conducted during the pre-construction phase (Years 1 to 3), construction phase (Year 4) and post-construction phase (Years 5 to 9) of the ABWP1 project. The surveys were conducted following an adaptation of the standard Joint Nature Conservation Committee (JNCC) European Seabirds at Sea (ESaS) methodology using line transects (Webb and Durinck, 1992). Further information with regards to the methodology can be found in the monitoring reports referenced in Table 6.5.~~

~~Acoustic Monitoring~~

~~6.3.1.4 The acoustic monitoring was designed to monitor harbour porpoise. The surveys used an acoustic data logger deployed to the northwest of the ABWP1 project area. Data was collected for 25 days between 1st August 2002 and 1st September 2002. Further information with regards to the methodology can be found in the monitoring reports referenced in Table 6.5.~~

~~Digital Aerial Survey (DAS)~~

~~6.3.1.5 These surveys were carried out to inform the baseline for the Proposed Development. Aerial digital methods are widely accepted as an appropriate methodology for collecting baseline data for offshore wind development, both in the UK and Ireland (see for example, DCCAE, 2018). Aerial surveys of seabirds and marine mammals commenced in March 2018 and continued monthly until February 2020 with an additional month (April 2020) added to cover a missed survey in April 2019 (due to adverse weather). The surveys were conducted by HiDef from an aircraft equipped with four HiDef Gen II cameras with sensors to set resolution of 2 cm ground sample distance (GSD). The transects followed the routes at a height of ~550 m above sea level (ASL) and the aircraft operational speed was 220 km per hour. Position data for the aircraft was recorded using a Garmin GPSMap 296 receiver with differential GPS to give 1 m accuracy and allowed recording updates at one second intervals to match to bird and marine mammal observations.~~

~~6.3.1.6 A total of 20 transects spaced ~2 km apart, were carried out across the aerial survey area. This encompassed the Array Area, and a minimum 4 km buffer area; matching the survey area covered by the historical boat-based surveys but extending further to the west in order to sample the inshore area up to the Wicklow coastline. Transects were flown to cover a total length of approximately 340 km in each month, and the four cameras captured information across a total width of 500 m. The requirement was to provide 10% coverage of the Aerial Survey Area and therefore data from two partial cameras (100 m strip width) were subsampled giving a total strip width of 200 m to achieve 10% coverage (~68 km² per month).~~

Annex ~~2~~II Marine Mammal Species

6.3.2.4 A detailed characterisation of the receiving marine mammal environment is provided in the Marine Mammal Technical Report (NIS Volume III, Appendix 11.2: Marine Mammals Technical Report). This NIS draws on the key findings of that technical report and of NIS Volume I: Supporting Information for Screening for Appropriate Assessment (Revised March 2026), presenting only the information necessary to inform the Stage 2 AA of Annex II marine mammal QIs.

6.3.2.5 Based on the available existing and site-specific data, seven marine mammal species are considered likely to occur regularly in the vicinity of the Proposed Development. Of these, four Annex II species are relevant to this NIS and are considered further:

~~6.3.1.7 A technical report has been prepared to provide a detailed characterisation of the receiving baseline (Volume III, Appendix 11.2: Marine Mammals Technical Report). A summary of the key findings is included below, and conclusions are based upon findings within the report and the EIAR, Volume II, Chapter 11: Marine Mammals.~~

~~6.3.1.8 A review of the data available has confirmed the likely presence of the following Annex 2 species within the vicinity of the Proposed Development:~~

- Harbour porpoise;
- Bottlenose dolphin;
- Grey seal; and
- Harbour seal.

6.3.2.6 ~~6.3.1.9 In~~ Table 6.6~~,~~ presents density estimates~~,~~ and reference population ~~assessments are provided for each~~information for the Annex II marine mammal species~~. It should be noted that the~~ considered in this NIS. Site-specific density estimates are ~~not~~used to characterise local occurrence within the Proposed Development area; however, these are not considered representative of animal densities ~~across~~at the wider spatial scale ~~for large scale impacts such as from~~relevant to certain impact pathways, such as underwater noise ~~caused by~~during piling or UXO~~.~~ detonation. Assessments therefore draw on appropriate Management Unit (MU) or regional population estimates to quantify potential exposure to impacts. This approach is precautionary and consistent with standard practice for highly mobile species, recognising that SACs are part of broader connected populations, with the Proposed Development being located within the following for each species:

- Harbour porpoise – Celtic and Irish Sea MU;
- Bottlenose dolphin – Irish Sea MU;
- Grey seal and harbour seal – East region of Republic of Ireland (RoI).

Table 6.6: Marine mammal density (animals/~~km~~km²) and population estimates

Species	Density (animals/km²)	Density source	Reference population	Reference population estimate	Reference population source
Harbour porpoise	0.38	Site-specific DAS	Celtic and Irish Seas Management Unit (MU)	62,517	Inter-Agency Marine Mammal Working Group (IAMMWG) (2023)
	0.2803	Gilles *et al.* (2023)			
	Grid-cell specific	Derived from ~~SCANS-III~~SCANS-IV density surfaces (~~Lacey~~Gilles *et al.*, ~~2022~~2025)			
Bottlenose dolphin	0.0201	Rogan *et al.* (~~2018a~~2018)	Irish Sea MU	293	IAMMWG (2023)
	0.2352	Gilles *et al.* (2023)			

Species	Density (animals/km²)	Density source	Reference population	Reference population estimate	Reference population source
	Grid-cell specific	Derived from ~~SCANS-~~ ~~III~~SCANS-IV density surfaces (~~Lacey~~Gilles *et al.*, ~~2022~~2025)			
Grey seal	0.08	Grid cell-specific average across the Array Area and Cable Corridor and Working Area extracted from Carter *et al.* (2020)	East region of Republic of Ireland (RoI)	1,662	Scaled ~~from~~ count data (Morris and Duck, 2019)
Harbour seal	0.0003	Grid cell-specific average across the Array Area and Cable Corridor and Working Area extracted from Carter *et al.* (2020)	East region of ~~Republic of Ireland~~RoI	182	Scaled ~~from~~ count data (Morris and Duck, 2019)

HARBOUR PORPOISE

6.3.2.7 ~~6.3.1.10~~ Harbour ~~porpoises are~~porpoise is listed under Annex II of the Habitats Directive ~~as a species of Community~~and is a qualifying interest~~. There are~~ of several SACs screened in for Stage 2 AA ~~where harbour porpoises are listed as a qualifying feature. Within Ireland this comprises Blackwater Bank SAC, Lambay Island SAC, Codling Fault Zone SAC, Rockabill to Dalkey Island SAC, Carnsore Point SAC, Hook Head SAC, Roaringwater Bay and Islands SAC, Kenmare River SAC, Blasket Islands SAC, Belgica Mound Province SAC, Bunduff Lough and Machair / Trawalua / Mullaghmore SAC, Inishmore Island SAC, Kilkieran Bay and Islands SAC and West Connacht Coast SAC where~~ (Table 5.1). It is the most abundant and widely distributed cetacean species in Irish waters (Gilles *et al.*, 2023; Rogan *et al.*, 2018). Within the Celtic and Irish Seas MU, abundance is estimated at 62,517 individuals (95% confidence interval (CI): 48,324 – 80,877; coefficient of variation (CV): 0.13) (Inter-Agency Marine Mammal Working Group (IAMMWG), 2023; Table 6.6). At a national scale, the species has ~~a~~an '~~favourable~~Inadequate (U1)' conservation status and considered to have a 'stable' population trend ~~(NPWS, 2019). There are a number of sites which have only recently been designated for harbour porpoise (Blackwater Bay SAC, Lambay Island SAC, Codling Fault Zone SAC, Carnsore Point SAC, Hook Head SAC, Kenmare River SAC, Belgica Mound Province SAC, Bunduff Lough and Machair / Trawalua / Mullaghmore SAC, Inishmore Island SAC, Kilkieran Bay and Islands SAC and West Connacht Coast SAC) and do not have conservation status or trends established. On a precautionary basis the assessment is based upon the trends and status of the nearest designated site within the same population community (MU) as the new designation.~~in Ireland, based on the most recent national assessment (NPWS, 2025f).

~~6.3.1.11 Based on the data within the sources (Volume III, Appendix 11.2 – Marine Mammals Technical Report) stated within~~ Table 6.6~~, harbour porpoise are the most frequently recorded marine mammal species within the survey area, and they are present all year round, with the highest densities present in the summer months.~~

6.3.2.8 Harbour porpoise was regularly recorded during the site-specific surveys, occurring year-round, with higher relative occurrence and density recorded during the summer months (April to September) (see NIS Volume III, Appendix 11.2: Marine Mammal Technical Report for further detail). Whilst site-specific density estimates provide valuable fine-scale information on local habitat use, the most recent large-scale density estimate derived from the Small Cetaceans in European Atlantic waters and the North Sea survey (SCANS-IV; Gilles *et al.,* 2023) of 0.2803 animals/km^2 is considered more appropriate for assessing potential effects that may extend beyond the boundary of the Proposed Development (Table 6.6).

6.3.2.9 In 2024, the harbour porpoise QI was incorporated into the designation of several existing SACs in Ireland. At the time of assessment, some of these sites have been assigned site-specific COs for harbour porpoise; however, such site-specific COs are not yet published for Bunduff Lough and Machait / Trawalua / Mullaghmore SAC (Table 5.1). In this case, a precautionary approach has been applied, whereby site integrity is assessed in functional terms, based on the maintenance of access to suitable habitat, avoidance of disturbance, and the conditions supporting species' use of the site (see Section 6.4.13 for site-specific rationale and application). A similar approach has been applied to the 18 transboundary European sites also designated for harbour porpoise where site-specific COs are not known or available, based on information provided within Natura 2000 Standard Data Forms (see Section 6.4.24; Table 5.1).

BOTTLENOSE DOLPHIN

6.3.2.10 ~~6.3.1.12~~ Bottlenose dolphins are ~~also~~ listed under Annex II of the Habitats Directive ~~as a species of Community~~and are a qualifying interest~~. There are several~~ of three SACs screened in for Stage 2 AA ~~where bottlenose dolphin are listed as a qualifying feature, though all are transboundary sites.~~, including Hook Head SAC within Irish waters and two transboundary Welsh SACs (Table 5.1). The species is widespread and abundant in Irish waters (Gilles *et al.*, 2023; Rogan *et al.*, 2018). Within the Irish Sea MU, abundance is estimated as 293 individuals (95% CI: 108 – 793; CV: 0.54) (IAMMWG, 2023; Table 6.6). At a national scale, the species has a 'favourable' conservation status and a 'stable' population trend in Ireland, based on the most recent national assessments (NPWS, ~~2019~~2025).

6.3.2.11 ~~6.3.1.13 Only one~~A single group of bottlenose dolphin was recorded during the site-specific surveys~~ which has confirmed their presence.~~, confirming occasional use of the Proposed Development area (HiDef, 2020a; NIS Volume III, Appendix 11.2: Marine Mammal Technical Report). Encounter rates were low and insufficient to derive a robust site-specific density estimate. Similarly, ObSERVE surveys recorded limited occurrences within the relevant stratum (stratum 5), with greater abundance recorded elsewhere around Ireland (particularly on the south and west coasts of Ireland; Rogan *et al.*, 2018). Consequently, the highest large-scale density estimate derived from SCANS-IV (Gilles *et al.*, 2023) of 0.2352 animals/km² is applied for assessment purposes (Table 6.6).

GREY SEAL

6.3.2.12 ~~6.3.1.14~~ Grey ~~seals are~~seal is listed under Annex II of the Habitats Directive ~~as a species of Community Interest. There are several SACs screened in for stage 2 AA where grey seal are listed as~~and is a qualifying ~~feature. Within Ireland this comprises of~~ interest of two Irish SACs (Lambay Island SAC and Saltee Islands SAC), as well as three transboundary Welsh SACs (Lleyn Peninsula and the Sarnau SAC; Pembrokeshire Marine SAC, and Cardigan Bay SAC) screened in for Stage AA assessment (Table 5.1). Grey seals are widely distributed around Ireland and

occur year-round (Morris and Duck, 2019). At a national scale, the species has a 'favourable' conservation status and an 'increasing' population trend in Ireland (NPWS, ~~2019~~2025f).

~~6.3.1.15 A total of 15 grey seals were recorded within the survey area across eight of the 25 site-specific DAS.~~

6.3.2.13 Telemetry data indicate connectivity of grey seals between east coast haul-outs and other regions, including Wales, southwest England, and southwest Scotland, supporting the potential for regional movement of individuals across the wider Irish and UK marine environment (Carter *et al.*, 2020; 2022). On this basis, all SACs within typical foraging ranges of 100 km from the Proposed Development have been included in the assessment.

6.3.2.14 As formal MUs have not been defined for seals in Irish waters, the relevant reference populations for this assessment are derived from the most recent national and regional aerial surveys of seals in Ireland conducted during the harbour seal moulting season in August 2017 and 2018 (Morris and Duck, 2019). This estimated a total of 3,698 grey seals nationally, of which 418 occurred at haul-outs in the east region of Ireland (western Irish Sea) (Morris and Duck, 2019). Applying correction factors for the proportion of the population hauled-out at the time of survey (up to 23.9%; Russell *et al.*, 2016), and scaling by the average observed proportion (25.15%; 95% CI: 25.45 – 29.07%; SCOS, 2022), results in an estimate of 1,662 individuals, which is used as the reference population for grey seals in this assessment (Table 6.6).

6.3.2.15 During site-specific surveys, grey seals were recorded infrequently within the Proposed Development area, with estimated abundance per survey ranging from a minimum of eight individuals to a maximum of 40 individuals across the survey period (see Marine Mammal Technical Report (NIS Volume III, Appendix 11.2: Marine Mammal Technical Report) for further detail). However, the application of site-specific density estimates are limited by high inter-survey variability, low consistency in seal detections and the exclusion of sightings that could not be attributed to species level. Therefore, the average modelled density derived from grid cells within the Array Area and Cable Corridor and Working Area is applied for assessment purposes and is estimated at 0.08 animals/km^2 (extracted from Carter *et al.*, 2020; Table 6.6).

HARBOUR SEAL

6.3.2.16 ~~6.3.1.16~~ Harbour ~~seals are~~seal is listed under Annex II of the Habitats Directive ~~as a species of Community~~and is a qualifying interest~~. There is~~ of one Irish SAC screened in for Stage 2 AA ~~where harbour seal are listed as a qualifying feature. Within Ireland this comprises of~~ (Slaney River Valley SAC; Table 5.1). Harbour seals occur at lower abundance than grey seals along the east coast of Ireland and have a more restricted distribution and foraging range (Morris and Duck, 2019; Carter *et al.*, 2022). At a national scale, the species ~~has~~have a 'favourable' conservation status and a 'stable' population trend in Ireland (NPWS, ~~2019~~2025f).

~~6.3.1.17 Harbour seal were recorded twice during the site-specific DAS which has confirmed their presence.~~

6.3.2.17 Harbour seals favour inshore bays, coves, islands, and estuaries for haul-out. Known haul-out locations include Lambay Island to the north of the Proposed Development and Wexford Harbour to the south (Duck and Morris, 2013; Morris and Duck, 2019). The closest known harbour seal haul-out site to the Proposed Development is at North Bull Island, north of Dublin Bay (Duck and Morris, 2013). Harbour seals typically forage within 50 km of haul-out sites (Carter *et al.*, 2022), and the Proposed Development lies beyond this typical foraging range, indicating that the area is likely used only infrequently.

6.3.2.18 The harbour seal population size of the East region of the Republic of Ireland has been scaled by using an estimated average proportion of harbour seals hauled-out at the time of survey of 72% (95% CI: 0.54 – 0.88) (Lonergan *et al.*, 2013), resulting in a reference population of 182 individuals for the assessment (Table 6.6).

6.3.2.19 Site-specific data indicate very low levels of harbour seal occurrence within the Proposed Development area, with two individuals recorded in August 2018 and a single individual in April 2024 during site-specific DAS. Therefore, encounter rates were insufficient to derive site-specific density estimate for harbour seal. The average modelled harbour seal density across grid cells within the Array Area and Cable Corridor and Working Area is applied for assessment purposes and is 0.0003 animals/km^2 (extracted from Carter *et al.*, 2020; Table 6.6).

6.3.3 ~~6.3.2~~ Avoidance through Design and Standard Project Environmental Protection Measures of the Proposed Development

~~6.3.2.1 The design of the Proposed Development is such that some potential impact can be avoided as seen by applying the design features and management measures relevant to Marine Mammal receptors which are presented in~~ Table 6.7~~.~~

6.3.3.1 The design of the Proposed Development incorporates a range of avoidance and management measures to reduce potential impacts on Annex II marine mammal QIs. These include standard project environmental protection measures and procedural controls based on industry best practice, applied across the construction, operational and maintenance, and decommissioning phases.

6.3.3.2 The factored-in measures relevant to Annex II marine mammals are presented in Table 6.7. These measures have been assumed to be implemented, and the assessment of potential effects on Annex II marine mammal QIs takes them into account (Section 6.4). Accordingly, the determination of magnitude and significance of potential impacts reflects the reduced risk these measures provide.

Table 6.7: Project design and environmental protection measures relevant for Annex II marine mammal receptors

Factored In Measure	Justification
~~Impact avoidance/ reduction through the implementation of an~~ Environmental Management Plan (EMP) providing the overarching framework for environment management during construction ~~and~~, operational ~~phase.~~ and maintenance, and decommissioning phases of the Proposed Development. The EMP ~~will include~~includes mitigation/monitoring measures and commitments made within the ~~EIAR~~NIS and a Marine Pollution Contingency Plan (MPCP) which will include key emergency contact details (e.g. EPA, Irish Coast Guard (IRCG)). An EMP is included in NIS Volume III, Appendix 25.1: Environmental Management Plan (Revised March 2026).	Measures will be adopted to ensure that the potential for release of pollutants from construction, operational and maintenance, and decommissioning is minimised. These mitigation measures are: Storage of chemicals in secure designated areas in line with appropriate regulations and guidelines, specifically: • The Safety, Health and Welfare at Work (Chemical Agents) Regulations 2001 (as amended) (Schedule 4, Part 5); • International Convention for the Prevention of Pollution from Ships (MARPOL) 1973 (as amended)~~.~~ (Annex II, and Annex III regulations); • International Convention for the Safety of Life at Sea (SOLAS) (Chapter VII); and • OSPAR Annex III: On the Prevention and Elimination of Pollution from Offshore Sources. Double skinning and labelling (direction of flow and contents) of pipes and clearly labelled storage tanks containing hazardous substances: • Storage of these substances in impenetrable bunds; • Working vessels shall handle all wastes in accordance with International Maritime Organisation (IMO)

Factored In Measure	Justification
	requirements and in accordance with the requirements of national legislation (i.e. Sea Pollution Acts 1991 to 1999; Sea Pollution (Miscellaneous Provisions) Act 2006) as applicable; • All waste and/or litter, including potential pollutants produced during construction, operational and maintenance, and decommissioning of the Proposed Development shall be stored and returned to shore for authorised disposal at suitable facilities; and • Vessel refuelling to take place in port or under permit from the ~~Irish Coast Guard (~~IRCG~~)~~. In this manner, accidental release of contaminants from vessels will be strictly controlled, thus providing protection for marine life across all phases of the Proposed Development. Any accidental pollution of the marine environment shall be immediately reported to the IRCG and to any other local authorities who are likely to be affected by such pollution.
Cables will be buried where possible and protected where not possible as set out in Section 4 of the NIS Volume I: Supporting Information for Screening for Appropriate Assessment (Revised March 2026).	Commitment to the burial of cables where possible and protected where not possible, as set out in Section 4 of NIS Volume I: Supporting Information for Screening for Appropriate Assessment (Revised March 2026). While burial of cables will not reduce the strength of potential EMF, it does increase the distance between the source of EMF (i.e. the operational cables) and marine mammal receptors, thereby potentially reducing the potential effect on those receptors.
~~Impact avoidance/ reduction through implementation of a~~ Marine Mammal Mitigation Plan (MMMP) detailing the piling methodology, duration of piling, soft-start procedures, maximum piling energy and details of mitigation and monitoring parameters (NIS Volume III, Appendix 25.2: Marine Mammal Mitigation Plan).	The implementation of a piling MMMP will mitigate for the risk of permanent auditory injury to marine mammals within a 'mitigation zone'. The mitigation zone is determined considering the potential for instantaneous auditory injury based on the initial hammer strike energy of ~~825kJ~~825 kJ (i.e. soft start hammer energy). The ~~soft start~~ramp-up and soft-start will provide an audible cue to allow marine mammals to flee the area before piling at increased hammer energy commences. ~~The soft start~~These measures will help to mitigate any potential for auditory injury. Acoustic Deterrent Devices (ADDs) will be used prior to the ~~soft start~~ramp-up and soft-start to ensure marine mammals are deterred.
~~Impact avoidance/ reduction through implementation of a~~ MMMP for UXO clearance detailing the clearance methodologies, and details of the mitigation and monitoring parameters (NIS Volume III, Appendix 25.2: Marine Mammal Mitigation Plan).	A UXO MMMP will be implemented during any UXO clearance required. The MMMP will include measures to ensure the risk of instantaneous Permanent Threshold Shift (PTS) to marine mammals is negligible. The exact mitigation measures contained with the UXO MMMP are yet to be determined because the number, size, condition,

Factored In Measure	Justification
	and location of UXO that may require clearance are currently unknown, but measures will be in line with the latest relevant guidance. Multiple measures are available and have been implemented elsewhere for UXO clearance, such as the use of ADDs and scarer charges to displace animals to beyond the instantaneous PTS impact range, or noise abatement techniques where appropriate.
The MMMP, details the survey equipment to be deployed, details of mitigation and monitoring parameters (NIS Volume III, Appendix 25.2: Marine Mammal Mitigation Plan).	Proposed mitigation has been described in the MMMP, and will be implemented during site surveys and will include measures to ensure the risk of PTS to marine mammals is negligible.
Rehabilitation Schedule (NIS Volume III, Appendix 4.1: Rehabilitation Schedule).	The Rehabilitation Schedule sets out the methodology and schedule for decommissioning of the Proposed Development. The Rehabilitation Schedule confirms that there will be no piling operations during decommissioning of the monopiles.
Environmental Vessel Management Plan (VMP) is informed by best practice guidance to minimise the risk to marine mammals from vessel activities (NIS Volume III, Appendix 25.10: Environmental Vessel Management Plan).	Implementation of an Environmental VMP sets out mandatory requirements for all contractors and vessels operating on behalf of the Developer, in order to: • Minimise the risk of collision and injury to marine wildlife; • Minimise the risk of disturbance to marine wildlife; • Define the operational procedures contractors must follow when undertaking activities in proximity to wildlife; and • Establish the procedures for reporting any vessel collisions with marine wildlife.
The Developer confirms and commits that it will not carry out any works in respect of the Proposed Development under the planning permission (if granted) at the same time as any activities the subject of the Foreshore Licence for Site Investigations (FS007339) being carried out.	The Developer was granted a Foreshore Licence (FS007339) for Site Investigations (associated with the Proposed Development) from the Minister for Housing, Local Government and Heritage in May 2022. This Foreshore Licence expires in 2027. The Developer confirms and commits that it will not carry out any works in respect of the Proposed Development under the planning permission (if granted) at the same time as any activities the subject of the Foreshore Licence for Site Investigations (FS007339) being carried out. As such there is no temporal overlap between the activities consented in this Foreshore Licence and the Proposed Development and there will be no potential for cumulative effects.
The Developer confirms and commits that it will not carry out any works in respect of the Proposed Development under the planning permission (if granted) at the same time as any	The Developer submitted a Foreshore Licence Application for Site Surveys to the Minister for Housing, Local Government and Heritage in April 2023 (FS007555) ~~and~~. This application ~~is pending determination.~~ was

Factored In Measure	Justification
activities the subject of the Foreshore Licence Application for Site Surveys FS007555 ~~(should~~ are being carried out.~~a licence be granted) are being carried~~	determined and granted on 04 July 2024 and is valid until 04 June 2029. The Developer confirms and commits that it will not carry out any works in respect of the Proposed Development under the planning permission (if granted) at the same time as any activities the subject of the Foreshore Licence Application for Site Surveys FS007555 (should a licence be granted) are being carried out. As such there is no temporal overlap between the activities proposed in the Foreshore Licence Application and the Proposed Development.
~~Impact avoidance/ reduction through implementation of an Environmental Vessel Management Plan (EVMP) (Volume III, Appendix 25.10).~~	~~Implementation of an EVMP in order to:~~ ~~• Minimise the risk of collision and injury to marine wildlife;~~ ~~• Minimise the risk of disturbance to marine wildlife;~~ ~~• Offer guidance to contractors conducting activities on behalf of the Developer in proximity to wildlife; and~~ ~~• Provide contractors with the procedures for reporting vessel collisions with marine wildlife.~~

6.3.4 ~~6.3.3~~ Impacts and Parameters Assessed

6.3.4.1 ~~6.3.3.1~~ Both Project Design Options identified in Table 6.8 have the potential to result in AEoI on European Sites screened in for Annex II marine mammal QIs.

Table 6.8: Project Design Options 1 and 2 considered for the assessment of potential impacts on European Sites Screened in for Annex II marine mammal QIs

Potential impact	Phase			Project Design Option Assessed (1 and 2)	Parameter Differences Between Project Design Option 1 and 2 (if any)
	C	O	D		
Injury and/or disturbance to marine mammals from underwater noise during piling	✓	X	X	Project Design Option 1 **Construction Phase:** Foundation installation: WTGs installed on monopile foundations: • Installation of ~~56~~53 WTGs with a pile ~~diametre~~diameter between 7 m and a maximum diameter of 11 m within the Array Area; • Maximum of one foundation installed at any one time (within any 24 hour period); • Maximum hammer energy up to ~~6,600 kJ, average hammer energy up to 4,400~~3,500 kJ and a strike rate of 30 strikes per minute; • Soft start energy of 825 kJ modelled with slow ramp up of energy for ~~30~~40 minutes; • Anticipated maximum duration of piling at ~~5~~3 hours and ~~10~~40 minutes ~~per pile with an average duration of 4 hours per pile and~~; • Total of ~~75~~71 days when piling may occur over a maximum construction period of ~~5~~4 years. ~~Offshore Substations Platforms (~~OSP~~)~~ installed on monopile foundations: • Installation of 2 OSPs with a pile ~~diametre~~diameter between 7 m and a maximum pile diameter of 14 m within the Array Area; • Maximum of one foundation installed at any one time (within any 24 hour period); • Maximum hammer energy up to ~~6,600 kJ and an average hammer energy up to 6,000~~3,500 kJ; • Soft start energy of 825 kJ modelled with slow ramp up of energy for ~~30~~40 minutes;	Within the construction phase Project Design Option 1 consists of a larger number of foundations to be installed ~~58~~ 55 monopile foundations in total (~~56~~53 for WTGs and 2 for OSPs), whilst Project Design Option 2 comprises of 49 foundations in total (47 for WTGs and 2 for OSPs). Therefore, Project Design Option 1 will have a marginally greater potential for UWN from piling activities. Therefore, overall Project Design Option 1 ~~has a higher potential for impact than~~is considered conservatively representative of Project Design Option 2 in respect of the potential for injury and/or disturbance to marine mammals from underwater noise during piling.

Potential impact	Phase C O D	Project Design Option Assessed (1 and 2)	Parameter Differences Between Project Design Option 1 and 2 (if any)
		• Average maximum duration of ~~5~~3 hours and ~~10~~40 minutes per pile; and • Total of 4 days when piling may occur over a maximum construction period of ~~5~~4 years. Project Design Option 2 **Construction Phase:** Foundation installation: WTGs installed on monopile foundations: • Installation of 47 WTGs with a pile ~~diametre~~diameter between 7 m and a maximum of 11 m within the Array Area; • Maximum of one foundation installed at any one time (within any 24 hour period); • Maximum hammer energy up to ~~6,600 kJ, average hammer energy up to 4,400~~3,500 kJ and a strike rate of 30 strikes per minute; • Soft start energy of 825 kJ modelled with slow ramp up of energy for ~~30~~40 minutes; • Anticipated maximum duration of piling at ~~5~~3 hours ~~10~~40 minutes ~~per pile with an average duration of 4 hours per pile~~; and • Total of 63 days when piling may occur over a maximum construction period of ~~5~~4 years. OSPs installed on monopile foundations: • Installation of 2 OSPs with a pile ~~diametre~~diameter between 7 m and a maximum of 14 m within the Array Area; • Maximum of one foundation installed at any one time (within any 24 hour period); • Maximum hammer energy up to ~~6,600~~3,500 kJ ~~and an average hammer energy up to 6,000kJ~~;	

Potential impact	Phase C O D	Project Design Option Assessed (1 and 2)	Parameter Differences Between Project Design Option 1 and 2 (if any)
		• Soft start energy of 825 kJ modelled with slow ramp up of energy for ~~30~~40 minutes; • Maximum duration of ~~5~~3 hours ~~10~~40 minutes per pile; and • Total of 4 days when piling may occur over a maximum construction period of ~~5~~4 years.	
Injury and/or disturbance to marine mammals from underwater noise during UXO clearance	✓ X X	Project Design Option 1 and 2 **Construction phase:** • The type, size, and number of possible UXO that may require clearance is currently unknown. • An illustrative assessment is presented using charge weights (TNT equivalent) ranging from 25 to 800 kg, with an additional donor weight of 0.5 kg, for high order detonation. A charge weight of 0.5 kg is used to provide an illustrative assessment of a low order (deflagration) detonation.	The parameters assessed are the same between Project Design Option 1 and 2. Therefore, Project Design Option 1 is considered representative of Project Design Option 2 in respect of the potential for injury and/or disturbance to marine mammals from underwater noise during UXO clearance.
~~Changes in electromagnetic fields (EMF) from subsea electrical cabling~~**Injury and/or disturbance to marine mammals from underwater noise during site surveys**	~~X~~ ✓ X ✓	Project Design Option 1 and 2 **Construction phase:** As the exact survey equipment to be deployed during confirmatory surveys has not yet been confirmed, the assessment has been based on equipment types and source levels anticipated to be used and considered representative of the range of available options. Injury and/or disturbance to marine mammals from underwater noise during site surveys: • Geophysical (non-impulsive sonar based) surveys including Multibeam Echosounder (MBES), Side scan sonar (SSS), Sub-bottom Profiler (SBP) and Ultra-short Baseline (USBL); • Geophysical surveys including seismic refraction and sparker; and • Geotechnical surveys including seismic cone penetration test (CPT), vibrocore, and grab sampling.	~~No differences in~~The parameters ~~for EMF for~~assessed are the same between Project Design Option 1 and 2. Therefore, Project Design Option 1 is considered representative of Project Design Option 2 in respect of the potential for injury and/or disturbance to marine mammals from underwater noise during site surveys.

Potential impact	Phase C O D	Project Design Option Assessed (1 and 2)	Parameter Differences Between Project Design Option 1 and 2 (if any)
		Operational and maintenance phase: Injury and/or disturbance to marine mammals from underwater noise during site surveys: ~~Presence of inter-array, OSP interconnector, and offshore export cables:~~ ~~• 66 kV inter-array cables between 110 – 122 km in length;~~ ~~• 220 kV OSP interconnector cables between 25 – 28 km in length;~~ ~~• 220 kV offshore export cables between 35 – 40 km in length;~~ • ~~Burial depth between 0-1.5 m for~~ Geophysical surveys (inter-array cables ~~and 0-2.5 m for OSP interconnector and offshore export cables~~) every six months for the first two years and annually thereafter; ~~• Up to 15% of inter-array cable routes, up to 50% of OSP interconnector cable routes, and 20% of Cable Corridor and Working Area requiring protection;~~ • Geophysical surveys (inter-connector cables) every six months for the first two years and annually thereafter; and • Geophysical surveys (export cables) every six months for the first two years and annually thereafter. ~~• Maximum three third party export cable crossings; and~~ ~~Operational phase up to 36.5 years.~~The exact equipment to be deployed during the geophysical site surveys has not yet been confirmed. Therefore, the assessment has been based on the equipment types and source levels assessed for the construction phase, which are considered representative of the range of equipment likely to be used. Injury and/or disturbance during operational and maintenance phase is anticipated to be similar in nature to the construction phase.	
Injury and/or disturbance to marine	✓ ✓ X	Project Design Option 1 and 2 **Construction phase:**	The parameters assessed are the same between Project Design Option 1 and 2. Therefore, Project Design Option 1 is considered representative of Project Design Option 2 in respect of the potential for

Potential impact	Phase C O D	Project Design Option Assessed (1 and 2)	Parameter Differences Between Project Design Option 1 and 2 (if any)
mammals from dredging and trenching		Injury and/or disturbance to marine mammals form dredging and trenching: • Backhoe dredging, grab or clamshell dredging for seabed lowering and feature clearance; • Mass/Controlled Flow Excavation or water injection dredging for seabed lowering and feature clearance; • Suction hopper dredging for seabed lowering and feature clearance; • Exit pits for horizontal directional drilling will be achieved with dredging and use of excavators; and • Burial of offshore export cables with the use of jet trenching, mechanical trenching and vertical injector. **Operational and maintenance phase:** Injury and/or disturbance to marine mammals form dredging and trenching: • Scour protection repair and maintenance for WTG and OSP foundations at all assets every five years will require specialist dredging vessel; ~~Presence of inter-array, OSP interconnector, and offshore export cables:~~ ~~• 66 kV inter-array cables between 110 – 122 km in length;~~ ~~• 220 kV OSP interconnector cables between 25 – 28 km in length;~~ ~~• 220 kV offshore export cables between 35 – 40 km in length;~~ ~~• Burial depth between 0-1.5 m for inter-array cables and 0-2.5 m for OSP interconnector and offshore export cables;~~ ~~• Up to 15% of inter-array cable routes, up to 50% of OSP interconnector cable routes, and 20% of Cable Corridor and Working Area requiring protection;~~ • ~~Maximum three third party export cable crossings~~Removal of excess seabed sediment and reburial of exposed cables; and	injury and/or disturbance to marine mammals from dredging and trenching.

Potential impact	Phase C O D	Project Design Option Assessed (1 and 2)	Parameter Differences Between Project Design Option 1 and 2 (if any)
		• ~~Operational phase up to 36.5~~Trenching for cable repair and reburial once every five years.	

Injury and/or disturbance to marine mammals from vessel activities	✓	✓	✓	Project Design Option 1 and 2 **Construction Phase:** Injury and/or disturbance to marine mammals from vessel activities during construction: • Maximum of ~~66~~69 installation vessels in the Array Area at any one time (including 12 installation vessels along the Cable Corridor and Working Area at any one time, and maximum of ~~seven~~7 installation vessels in the vicinity of the landfall at any one time); • A maximum of 4,150 vessel return trips over the construction phase and a maximum of 1,797 vessel return trips per year during the construction phase, comprised of jack-up vessels, tug/anchor handlers, cable installation vessels, guard vessels, survey vessels, crew transfer vessels, scour/cable protection installation vessels, pre-installation boulder clearance vessels, sandwave clearance vessels, UXO clearance vessels and other support vessels; and • Maximum construction schedule of 24 hours a day, 7 days a week for a maximum construction period of ~~5~~4 years. Within this period, offshore export cable installation may take place over a period of 12 months. **Operational and Maintenance phase:** Injury and/or disturbance to marine mammals from vessel activities during the operational and maintenance phase: • Maximum of 1,359 vessel round trips per year comprised of crew transfer vessels, jack-up vessels, cable repair vessels and other vessels, from local ports or transiting from a previously operational location; • Up to 30 operational and maintenance ~~(O&M)~~ vessels on site at any one time; and • Operational phase up to 36.5 years. **Decommissioning Phase:** Injury and/or disturbance during the decommissioning phase is anticipated to be similar in nature, but of lower magnitude, to the construction phase.	~~No differences in~~The parameters assessed are the same between Project Design Option 1 and 2. Therefore, Project Design Option 1 is considered representative of Project Design Option 2 in respect of the potential for injury and/or disturbance to marine mammals from vessel activities ~~for Project Design Option 1 and Project Design Option 2~~.

Potential impact	Phase			Project Design Option Assessed (1 and 2)	Parameter Differences Between Project Design Option 1 and 2 (if any)
	C	O	D		
Changes in EMF from subsea electrical cabling	X	✓	X	Project Design Option 1 and 2 ~~**Construction Phase:**~~ ~~Injury and/or disturbance to marine mammals from vessel activities during construction:~~ ~~• Maximum of 66 installation vessels in the Array Area at any one time (including 12 installation vessels along the Cable Corridor and Working Area at any one time, and maximum of 7 installation vessels in the vicinity of the landfall at any one time);~~ ~~• A maximum of 4,150 vessel return trips over the construction phase and a maximum of 1,797 vessel return trips per year during the construction phase, comprised of jack-up vessels, tug/anchor handlers, cable installation vessels, guard vessels, survey vessels, crew transfer vessels, scour/cable protection installation vessels, pre-installation boulder clearance vessels, sandwave clearance vessels, UXO clearance vessels and other support vessels; and~~ ~~• Maximum construction schedule of 24 hours a day, 7 days a week for a maximum construction period of 5 years. Within this period, offshore export cable installation may take place over a period of 12 months.~~ **Operational and Maintenance phase:** ~~Injury and/or disturbance to marine mammals from vessel activities during the operational and maintenance phase:~~ Presence of inter-array, OSP interconnector, and offshore export cables: • 66 kV inter-array cables between 110 – 122 km in length; • 0 kV (Fibre optic only) / 66 kV / 220 kV OSP interconnector cables between 25 – 28 km in length; • 220 kV offshore export cables between 35 – 40 km in length; • Burial depth between 0 - 1.5 m for inter-array cables and 0 - 2.5 m for OSP interconnector and offshore export cables;	The parameters assessed are the same between Project Design Option 1 and 2. Therefore, Project Design Option 1 is considered representative of Project Design Option 2 in respect of the potential for changes in EMF from subsea electrical cabling.

Potential impact	Phase C O D	Project Design Option Assessed (1 and 2)	Parameter Differences Between Project Design Option 1 and 2 (if any)
		• Up to ~~1,359 vessel round trips per year during the operational maintenance phase, comprised of crew transfer vessels, jack-up vessels, cable repair vessels and other vessels;~~15% of inter-array cable routes, up to 50% of OSP interconnector cable routes, and 20% of Cable Corridor and Working Area requiring protection; ~~• Up to 30 operational and maintenance (O&M) vessels on site at any one time; and~~ • Maximum three third party export cable crossings; and • Operational phase up to 36.5 years. ~~**Decommissioning Phase:**~~ ~~Injury and/or disturbance during the decommissioning phase is anticipated to be similar in nature, but of lower magnitude, to the construction phase.~~	

Potential impact	Phase C O D	Project Design Option Assessed (1 and 2)	Parameter Differences Between Project Design Option 1 and 2 (if any)
Changes in fish and shellfish community affecting prey resources	✓ ✓ ✓	Project Design Option 1 and 2 **Construction Phase:** • Temporary subtidal habitat loss/disturbance; • Increased ~~suspended sediment concentrations (~~SSC~~)~~ and associated ~~sediment~~ deposition; • Injury and/or disturbance to fish and shellfish from underwater noise and vibration during pile driving and cable installation; and • Accidental pollution. **Operational and maintenance phase:** • Temporary subtidal habitat loss/disturbance; • Increased SSC and associated sediment deposition; • Accidental pollution; • Long-term habitat loss as a result of the presence of foundation structures, scour protection, and cable protection; • Alteration of seabed habitats arising from changes in physical processes as a result of the presence of foundation structures, scour protection, and cable protection; and • Changes in ~~Electromagnetic Fields (~~EMF~~)~~ from subsea cabling. **Decommissioning Phase:** • Temporary subtidal habitat loss/disturbance; • Increased ~~suspended sediment concentrations (~~SSC~~)~~ and associated ~~sediment~~ deposition; and • Accidental pollution. ~~Project Design Option 2~~ ~~**Construction Phase:**~~ ~~• Temporary subtidal habitat loss/disturbance;~~	Within the construction phase Project Design Option 1 consists of a larger number of foundations to be installed – ~~58~~55 monopile foundations in total (~~56~~53 for WTGs and 2 for OSPs), whilst Project Design Option 2 comprises of 49 foundations in total (47 for WTGs and 2 for OSPs). Therefore, Project Design Option 1 will have a marginally greater potential for changes in fish and shellfish community affecting prey resource and is considered conservatively representative of Project Design Option 2. Within the Decommissioning Phase Project Design Option 1 will result in the deconstruction and removal of all ~~56~~53 WTG topsides and 2 OSP topsides, with both to be cut at seabed level, whilst Project Design Option 2 consists of the deconstruction and removal of all 47 WTG topsides and 2 OSP topsides , with both to be cut at seabed level. Therefore, Project Design Option 1 will have a marginally greater potential for changes in fish and shellfish community affecting prey resource and is considered conservatively representative of Project Design Option 2. Therefore, overall Project Design Option 1 ~~has a higher potential for impact than~~is considered conservatively representative of Project Design Option 2 in respect of the potential for changes in fish and shellfish community affecting prey resources.

Potential impact	Phase C O D	Project Design Option Assessed (1 and 2)	Parameter Differences Between Project Design Option 1 and 2 (if any)
		• ~~Increased suspended sediment concentrations (SSC) and associated sediment deposition;~~ • ~~Injury and/or disturbance to fish and shellfish from underwater noise and vibration during pile driving and cable installation; and~~ • ~~Accidental pollution.~~ **~~Operational and maintenance phase:~~** • ~~Temporary subtidal habitat loss/disturbance;~~ • ~~Increased SSC and associated sediment deposition;~~ • ~~Accidental pollution;~~ • ~~Long-term habitat loss as a result of the presence of foundation structures, scour protection, and cable protection;~~ • ~~Alteration of seabed habitats arising from changes in physical processes as a result of the presence of foundation structures, scour protection, and cable protection; and~~ • ~~Changes in Electromagnetic Fields (EMF) from subsea cabling.~~ **~~Decommissioning Phase:~~** • ~~Temporary subtidal habitat loss/disturbance;~~ • ~~Increased suspended sediment concentrations (SSC) and associated sediment deposition; and~~ • ~~Accidental pollution.~~	
~~Injury and/or disturbance to marine mammals from underwater noise during site surveys~~	~~✓~~ ~~✓~~ ~~X~~	~~Project Design Option 1~~ **~~Construction phase:~~** ~~The exact equipment to be deployed during the site surveys are yet to be confirmed, therefore examples of different survey equipment and expected source levels have been used for this assessment.~~ ~~Injury and/or disturbance to marine mammals from underwater noise during site surveys:~~	~~The parameters assessed are the same between Project Design Option 1 and 2~~

Potential impact	Phase C O D	Project Design Option Assessed (1 and 2)	Parameter Differences Between Project Design Option 1 and 2 (if any)
		• ~~Geophysical (non-impulsive sonar based) surveys including MultiBeam Echosounder (MBES), Side scan sonar (SSS), and Sub-bottom Profiler (SBP);~~ • ~~Geophysical surveys including seismic refraction and sparker; and~~ • ~~Geotechnical surveys including seismic cone penetration test (CPT), vibrocore, and grab sampling.~~ **~~Operational and maintenance phase:~~** ~~Injury and/or disturbance to marine mammals from underwater noise during site surveys:~~ • ~~Geophysical surveys (inter-array cables) every six months for the first two years and annually thereafter;~~ • ~~Geophysical surveys (inter-connector cables) every six months for the first two years and annually thereafter; and~~ • ~~Geophysical surveys (export cables) every six months for the first two years and annually thereafter.~~ ~~The exact equipment to be deployed during the geophysical site surveys is unknown. Therefore, it is assumed that the equipment described in the construction phase will be used for the purposes of this assessment. Injury and/or disturbance during operational and maintenance phase is anticipated to be similar in nature to the construction phase.~~	
		~~Project Design Option 2~~ **~~Construction phase:~~** ~~The exact equipment to be deployed during the site surveys are yet to be confirmed, therefore examples of different survey equipment and expected source levels have been used for this assessment.~~ ~~Injury and/or disturbance to marine mammals from underwater noise during site surveys:~~	

Potential impact	Phase C O D	Project Design Option Assessed (1 and 2)	Parameter Differences Between Project Design Option 1 and 2 (if any)
		• Geophysical (non-impulsive sonar based) surveys including MultiBeam Echosounder (MBES), Side scan sonar (SSS), and Sub-bottom Profiler (SBP); • Geophysical surveys including seismic refraction and sparker; and • Geotechnical surveys including seismic cone penetration test (CPT), vibrocore, and grab sampling. **Operational and maintenance phase** Injury and/or disturbance to marine mammals from underwater noise during site surveys: • Geophysical surveys (inter-array cables) every six months for the first two years and annually thereafter; • Geophysical surveys (inter-connector cables) every six months for the first two years and annually thereafter; and • Geophysical surveys (export cables) every six months for the first two years and annually thereafter. The exact equipment to be deployed during the geophysical site surveys is unknown. Therefore, it is assumed that the equipment described in the construction phase will be used for the purposes of this assessment. Injury and/or disturbance during operational and maintenance phase is anticipated to be similar in nature to the construction phase.	
Injury and/or disturbance to marine mammals from underwater noise during UXO clearance	✓ X X	Project Design Option 1 **Construction phase:** The type, size, and number of possible UXO that may require clearance is currently unknown. An illustrative assessment is presented using charge weights (TNT equivalent) ranging from 25 to 800 kg, with an additional donor weight of 0.5 kg, for high order detonation. A charge	The parameters assessed are the same between Project Design Option 1 and 2

Potential impact	Phase C O D	Project Design Option Assessed (1 and 2)	Parameter Differences Between Project Design Option 1 and 2 (if any)
		~~weight of 0.5 kg is used to provide an illustrative assessment of a low order (deflagration) detonation.~~	
		~~Project Design Option 2~~ ~~**Construction phase:**~~ ~~The type, size, and number of possible UXO that may require clearance is currently unknown.~~ ~~An illustrative assessment is presented using charge weights (TNT equivalent) ranging from 25 to 800 kg, with an additional donor weight of 0.5 kg, for high order detonation. A charge weight of 0.5 kg is used to provide an illustrative assessment of a low order (deflagration) detonation.~~	
Accidental pollution	✓ ✓ ✓	Project Design Option 1 **Construction phase:** Accidental pollution in the Array Area during construction from: • Installation of ~~56~~53 WTGs and 2 OSPs within the Array Area; • Installation of inter-array cables between 110 – 122 km in length, OSP interconnector cables between 25 – 28 km in length, and offshore export cables between 35 – 40 km in length; • Maximum of ~~66~~69 installation vessels in the Array Area at any one time (including 12 installation vessels along the offshore Cable Corridor and Working Area at any one time, and maximum of 7 installation vessels in the vicinity of the landfall at any one time; • A maximum of 4,150 vessel return trips over the construction phase and a maximum of 1,797 vessel return trips per year during the construction phase, comprised of jack-up vessels, tug/anchor handlers, cable installation vessels, guard vessels, survey vessels, crew transfer vessels, scour/cable protection installation vessels, pre-	Within the construction phase Project Design Option 1 consists of a larger number of foundations to be installed – ~~58~~55 monopile foundations in total (~~56~~53 for WTGs and 2 for OSPs), whilst Project Design Option 2 comprises of 49 foundations in total (47 for WTGs and 2 for OSPs). Therefore, Project Design Option 1 will have a marginally greater potential for accidental pollution. Within the Decommissioning Phase Project Design Option 1 will result in the deconstruction and removal of all ~~56~~53 WTG topsides and 2 OSP topsides, with both to be cut at seabed level, whilst Project Design Option 2 consists of the deconstruction and removal of all 47 WTG topsides and 2 OSP topsides, with both to be cut at seabed level. Therefore, Project Design Option 1 will have a marginally greater potential for accidental pollution. Therefore, overall Project Design Option 1 ~~has a higher potential for impact than~~is considered conservatively of Project Design Option 2~~.~~ in respect of the potential for accidental pollution.

Potential impact	Phase C O D	Project Design Option Assessed (1 and 2)	Parameter Differences Between Project Design Option 1 and 2 (if any)
		installation boulder clearance vessels, sandwave clearance vessels, UXO clearance vessels and other support vessels; and • A maximum of 294 helicopter return trips over the construction phase and a maximum of 118 helicopter return trips per year. **Operational and maintenance phase:** Accidental pollution in the Array Area during ~~O&M~~operational and maintenance from: • Up to 30 ~~O&M~~operational and maintenance vessels on site at any one time; • Up to 1,359 vessel round trips per year comprised of crew transfer vessels, jack-up vessels, cable repair vessels and other vessels, from local ports or transiting from a previously operational location; • A maximum of 485 helicopter return trips per year; • Presence of ~~56~~53 WTGs and 2 OSPs; and • Maintenance activities of ~~56~~53 WTGs and 2 OSPs. **Decommissioning phase:** Accidental pollution in the Array Area during decommissioning from: • Decommissioning of ~~56~~53 WTGs and 2 OSPs.	
		<u>Project Design Option 2</u> **Construction phase:** Accidental pollution in the Array Area during construction from: • Installation of 47 WTGs and 2 OSPs within the Array Area; • Installation of inter-array cables between 110 – 122 km in length, OSP interconnector cables between 25 – 28 km in length, and offshore export cables between 35 – 40 km in length; and	

Potential impact	Phase C O D	Project Design Option Assessed (1 and 2)	Parameter Differences Between Project Design Option 1 and 2 (if any)
		• Maximum of ~~66~~69 installation vessels in the Array Area at any one time (including 12 installation vessels along the offshore Cable Corridor and Working Area at any one time, and maximum of 7 installation vessels in the vicinity of the landfall at any one time. • A maximum of 4,150 vessel return trips over the construction phase and a maximum of 1,797 vessel return trips per year during the construction phase, comprised of jack-up vessels, tug/anchor handlers, cable installation vessels, guard vessels, survey vessels, crew transfer vessels, scour/cable protection installation vessels, pre-installation boulder clearance vessels, sandwave clearance vessels, UXO clearance vessels and other support vessels; and • A maximum of 294 helicopter return trips over the construction phase and a maximum of 118 helicopter return trips per year. **Operational and maintenance phase:** Accidental pollution in the Array Area during ~~O&M~~operational and maintenance from: • Up to 30 operational and maintenance vessels on site at any one time; • Maximum of 1,359 vessel round trips per year comprised of crew transfer vessels, jack-up vessels, cable repair vessels and other vessels, from local ports or transiting from a previously operational location; ~~• Up to 30 O&M vessels on site at any one time;~~ • Presence of 47 WTGs and 2 OSPs; and • Maintenance activities of 47 WTGs and 2 OSPs. **Decommissioning phase:** Accidental pollution in the Array Area during decommissioning from: • Decommissioning of 47 WTGs and 2 OSPs.	

6.4 Assessment of Proposed Development alone for Annex II Marine Mammal QIs

Sites within Ireland

6.4.1 Blackwater Bank SAC

Harbour porpoise

~~6.4.1.1 The conservation objectives for harbour porpoise at this designated site have yet to be provided as it has only recently been designated as a site with harbour porpoise as a qualifying interest. Therefore, on a precautionary basis, we will be basing our assessment on the conservation objectives for West Wales Marine SAC as it is the next closest designated site with the same QI of harbour porpoise. The COs are to maintain the favourable conservation condition of the feature, how this is defined is presented in Table 5.1.~~

6.4.1.1 The relevant Annex II marine mammal QI site-specific COs at Blackwater Bank SAC is to maintain the favourable conservation condition of the harbour porpoise QI, as defined by the following list of attributes, targets and technical clarifications (NPWS, 2024a):

- *Access to suitable habitat:* Species range within the site should not be restricted by artificial barriers to site use:
  - This target may be considered relevant to proposed activities or operations that will result in the permanent exclusion of harbour porpoise from part of its range within the site, or will permanently prevent access for the species to suitable habitat therein; and
  - It does not refer to short-term or temporary restriction of access or range.
- *Disturbance:* Human activities should occur at levels that do not adversely affect the harbour porpoise community at the site:
  - Proposed activities or operations should not introduce man-made energy (e.g. aerial or underwater noise, light or thermal energy) at levels that could result in a significant negative impact on individuals and/or the community of harbour porpoise within the site. This refers to the aquatic habitats used by the species in addition to important natural behaviours during the species' annual cycle;
  - This target also relates to proposed activities or operations that may result in the deterioration of key resources (e.g. water quality, feeding, etc.) upon which harbour porpoise depend. In the absence of complete knowledge on the species ecological requirements at this site, such considerations should be assessed where appropriate on a case-by-case basis; and
  - Proposed activities or operations should not cause death or injury to individuals to an extent that may ultimately affect the harbour porpoise community at the site.

6.4.1.2 There are ~~five key~~eight potential ~~impacts on~~impact pathways relevant to harbour porpoise associated with the construction, operational and maintenance, and decommissioning of the Proposed Development, ~~which are presented~~as identified in Table 6.8 and ~~are~~ assessed below for each phase of the Proposed Development.

INJURY AND/OR DISTURBANCE FROM UNDERWATER NOISE FROM PILING

6.4.1.3 Underwater noise has the potential to impact marine mammals if the sound frequency ~~is~~falls within their hearing range, and in particular, if the sound levels ~~are greater than~~exceed the relevant thresholds for the Functional Hearing Group (FHG) for which the species is categorised. With consideration of harbour porpoise, they are within the Very High Frequency

(VHF) ~~cetacean hearing group and have a~~FHG, with an estimated hearing range of 275 Hz to 160 kHz~~. The impacts can range from auditory injury, disturbance and displacement, to changes in behaviour including masking depending on the severity of the underwater noise.~~ (Southall *et al.*, 2019).

6.4.1.4 Exposure to impulsive underwater noise, such as pile driving, can result in a range of effects, from a reduction in hearing sensitivity which may be temporary (Temporary Threshold Shift; TTS) or permanent (PTS), to behavioural disturbance and displacement.

ASSESSMENT METHODOLOGY

6.4.1.5 Underwater noise levels generated during pile driving were predicted by Subacoustech Environmental Ltd using their Impulse Noise Sound Propagation and Impact Range Estimator (INSPIRE) model. Full details of the underwater noise modelling methodology and the resulting impact areas and ranges are provided in the Underwater Noise Assessment (NIS Volume III, Appendix 11.1: Underwater Noise Assessment (Revised March 2026)).

6.4.1.6 Where two Project Design Options are considered, Project Design Option 1 represents the scenario with the greatest potential for underwater noise generation, principally due to the greater number of monopile foundations and associated piling activity during the construction phase (Table 6.8). For all other effects on marine mammals, Project Design Option 1 and Project Design Option 2 have the same parameters. Accordingly, Project Design Option 1 parameters are used as the basis for the assessment. The assessment of Project Design Option 1 is conservatively representative of Project Design Option 2, and the conclusions of the assessment would not change, as Project Design Option 2 would not give rise to greater underwater noise or other effects.

6.4.1.7 Modelling included the prediction of impacts across five representative locations: WTG monopiles at three locations (North (N), Central (C), and Southwest (SW)) and two OSP monopile locations (North OSP (N-OSP), and South (S-OSP). All underwater noise modelling assumed maximum pile diameters to provide a conservative estimate of potential effects.

6.4.1.8 Two foundation scenarios were modelled across these locations:

- 11 m monopile foundations at the N, C and SW WTG locations, installed with a maximum blow energy of 3,500 kJ; and
- 14 m monopile foundations at the N-OSP and S-OSP location, installed with a maximum blow energy of 3,500 kJ.

6.4.1.9 For each foundation scenario, two mitigation scenarios were considered:

- Ramp-up mitigation scenario, commencing at 825 kJ and considered the base-case; and
- Extended ramp-up mitigation scenario, commencing at 400 kJ.

6.4.1.10 Both scenarios assume the same maximum hammer energy (3,500 kJ), but differ in soft-start energy levels. Further details of these mitigation scenarios are provided in the Marine Mammal Mitigation Plan (MMMP; NIS Volume III, Appendix 25.2: Marine Mammal Mitigation Plan).

6.4.1.11 The ramp-up mitigation scenario (the base-case) is presented for comparative purposes, to illustrate the base level of effect and therefore highlight the reduction in effect achieved through the extended ramp-up mitigation scenario. The extended ramp-up scenario represents additional mitigation committed by the Applicant in order to further reduce the potential significance of effects. As the extended ramp-up mitigation scenario has been committed to, all conclusions of this assessment are based on this scenario.

6.4.1.12 For each combination of location, foundation scenario, and mitigation scenario, predicted impacts were calculated using three density estimates (Table 6.6), including both site-specific and regional values. The broader regional density estimate was applied as the primary precautionary metric to evaluate potential exposure of Annex II marine mammal QIs.

6.4.1.13 There are no site-specific abundance estimates for the Blackwater Bank SAC. Therefore, quantitative assessments have been undertaken against the wider reference population. Similarly, the number of animals that may be impacted is representative of animals across the reference population scale, rather than the number of animals within Blackwater Bank SAC specifically. Using wider species reference populations (such as species-specific MU or other regional populations; Table 6.6) allows the assessment to quantify potential exposure while avoiding or relying on unsupported assumptions about discrete SAC-specific populations. The potential impact on individual SACs is further contextualised through spatial analysis, comparing the predicted impact ranges from activities such as underwater noise sources with the SAC boundary. This ensures that the assessment provides information on the proportion of animals likely to be affected within the SAC.

APPROACH TO PTS- AND TTS-ONSET

6.4.1.14 The PTS- and TTS-onset thresholds used to assess the potential for auditory impacts during pile driving are those presented in Southall *et al.* (2019) for impulsive noise, applied relative to each marine mammal QI FHG (Table 6.9). These thresholds form the basis for calculating impact ranges, defined as the areas around piling locations where noise levels exceed the PTS or TTS thresholds.

6.4.1.15 Two metrics were applied to quantify potential auditory impacts in accordance with current best practice; peak sound pressure level (SPL_{peak}) and cumulative sound exposure level (SEL_{cum}):

- Unweighted SPL_{peak} values were used to assess the potential for instantaneous PTS and, for context TTS (Table 6.9), as peak sound pressure-related damage is not frequency dependent and is therefore restricted to the audible frequency range of a species;
- SEL_{cum} thresholds were applied to account for accumulated sound exposure over the duration of a piling event, with sound energy weighted using species-specific auditory weighting curves (Southall *et al.*, 2019).

6.4.1.16 PTS-onset, applied using these metrics, represent the exposure level at which auditory injury may occur. PTS is therefore used in this assessment as the indicator of potential auditory injury, with calculated impact ranges showing the area around piling locations where PTS is predicted to occur. The number of individuals potentially exposed to auditory injury (PTS-onset) was estimated by combining modelled impact ranges with species density estimates, allowing the proportion of the relevant MU (Irish and Celtic Sea MU; Table 6.6) reference population impacted to be quantified. These estimates are precautionary, as they assume that all animals present within the PTS-onset impact ranges are affected, whereas empirical dose-response data (Donovan *et al.*, 2017) suggest that only approximately 18–19% of animals are likely to experience PTS at these exposure levels.

6.4.1.17 The TTS-onset thresholds presented in Southall *et al.* (2019) define the minimum exposure at which a temporary reduction in hearing sensitivity of approximately 6 dB is expected to occur. These thresholds are based on limited empirical data for impulsive noise sources such as pile driving, reflecting ethical constraints on inducing permanent auditory injury in experimental studies on marine mammals. For this reason, TTS-onset have been used primarily as a precautionary indictor to inform understanding of PTS-onset risk, with higher levels of TTS (e.g. 40 dB) considered indicative of possible PTS (Southall *et al.*, 2007).

6.4.1.18 As TTS-onset thresholds were developed principally as a means of predicting potential PTS, there is currently no established threshold at which TTS-onset would indicate biological significance, and their use is therefore likely to overestimate the spatial extent of ecologically relevant impacts. Consequently, it is not possible to undertake a quantitative assessment of TTS impacts for Annex II marine mammal QIs.

6.4.1.19 It is important to note that whilst TTS-onset thresholds are presented in Table 6.9 for context, TTS is not considered an auditory injury due to its temporary nature. Any potential effects associated with TTS are considered to be captured within the quantitative assessment of disturbance. Further reasoning and details are presented in NIS Volume III, Appendix 11.5: Temporary Threshold Shift (TTS) Position Paper - SMRU Consulting (RFI March 2026).

Table 6.9: Marine mammal PTS and TTS-onset thresholds for impulsive noise (Southall *et al.*, 2019)

Species	FHG	Cumulative PTS (SEL_{cum} dB re 1 μPa^2s weighted)	Instantaneous PTS (SPL_{peak} dB re 1 µPa unweighted)	Cumulative TTS (SEL_{cum} dB re 1 μPa^2s weighted)	Instantaneous TTS (SPL_{peak} dB re 1 µPa unweighted)
Harbour porpoise	Very High Frequency (VHF) cetacean	155	202	140	196
Dolphin species (bottlenose dolphin)	High Frequency (HF) cetacean	185	230	170	224
Seal species (in water) (grey seal, harbour seal)	Phocid (in water) (PCW)	185	218	170	212

BEHAVIOURAL DISTURBANCE FROM PILING ASSESSMENT METHODOLOGY

6.4.1.20 Disturbance from underwater noise during pile driving was assessed using a species-specific dose-response approach, consistent with current best practice. This method quantifies the probability of a behavioural response to a stressor or stimulus as a function of received sound exposure (Dunlop *et al.*, 2017), recognising that not all animals within an impact area will respond, unlike traditional methods of threshold-based assessments.

6.4.1.21 For the purpose of this assessment, the dose was defined as the received single-strike exposure level (SEL_{SS}; Southall, 2021). Modelled SEL_{SS} contours at 5 dB intervals generated by underwater noise modelling (see NIS Volume III, Appendix 11.1: Underwater Noise Assessment) were overlain on marine mammal species-specific density surfaces to quantify the number of individuals exposed to each sound level, and subsequently the number likely to experience behavioural disturbance based on the dose-response curve.

6.4.1.22 The predictions for the two foundation scenarios across the five modelling locations (N WTG, C WTG, SW WTG, N-OSP, and S-OSP) were presented separately in the Underwater Noise Assessment (NIS Volume III, Appendix 11.1: Underwater Noise Assessment). Disturbance from concurrent piling within the Proposed Development alone has not been assessed, as piling is limited to one installation per day (see Table 6.8). A precautionary approach has been taken in this impact assessment by using the regional population value density estimate where multiple estimates were available.

6.4.1.23 The dose-response function applied was developed by Graham *et al.* (2017b) for harbour porpoise, based on empirical data collected during the first six weeks of piling during Phase 1 of the Beatrice offshore windfarm. Following the development of this dose-response curve, additional data from the remaining piling events have been processed and showed that the

responses of harbour porpoises to piling noise diminishes over the construction period (Graham *et al.*, 2019). Therefore, the application of the dose-response curve from the initial piling event in this assessment can be considered precautionary.

CONSTRUCTION PHASE ASSESSMENT

AUDITORY INJURY (PTS)

6.4.1.24 Predicted impact areas and maximum ranges for auditory injury (PTS-onset) to harbour porpoise from pile driving during construction from the Proposed Development, under both mitigation piling scenarios (ramp-up (base-case) and extended ramp-up), are presented in Table 6.10.

6.4.1.25 For the ramp-up mitigation scenario, the maximum instantaneous PTS-onset impact range was 580 m for the installation of a 11 m monopile at the SW WTG location, which represents the piling location closest to Blackwater Bank SAC (Table 6.10). This equates to a maximum of one individual potentially experiencing auditory injury, representing <0.01% of the reference population of 62,517 within the Celtic and Irish Sea MU (IAMMWG, 2023), based on the SCANS-IV density estimate.

6.4.1.26 Using the cumulative PTS-onset thresholds, the maximum predicted impact range for the same installation was 1.5 km, equating to a maximum of one individual (<0.01% of the MU reference population; Table 6.10) based on both the site-specific DAS density estimate and SCANS-IV density estimate. Application of the modelled grid-specific SCANS-IV density estimate similarly predicted a maximum of one individual (<0.01% of the MU reference population) for both instantaneous and cumulative PTS-onset (Table 6.10).

6.4.1.27 In addition to the ramp-up mitigation scenario, the Applicant has committed to the implementation of an extended ramp-up mitigation scenario (see Section 6.4.1.10). With this additional mitigation in place, the maximum instantaneous PTS-onset impact range remained at 580 m at the SW WTG location, corresponding to a maximum of one individual (<0.01% of the MU reference population) across all density estimates (Table 6.10). Predicted cumulative PTS-onset impact ranges were reduced to <50 m at all piling locations, equating to a maximum of one individual experiencing auditory injury (<0.01% of the MU reference population) for all density estimates (Table 6.10).

6.4.1.28 Importantly, the maximum PTS-onset ranges under all modelling scenarios for harbour porpoise fall entirely within the 1,000 m R_{safe} distance to be implemented through the project-specific MMMP (NIS Volume III, Appendix 25.2: Marine Mammal Mitigation Plan). As a result, the extended ramp-up procedure and implemented mitigation measures will ensure that all marine mammals are displaced from the injury risk area prior to the onset of full piling energy. Consequently, no animals are expected to be exposed to sound levels capable of causing auditory injury (PTS).

6.4.1.29 Overall, predicted auditory injury to harbour porpoise from pile driving during construction is extremely limited in spatial extent and scale, with the SW WTG location representing the most precautionary and most relevant piling location in relation to Blackwater Bank SAC.

Table 6.10: Predicted impact range of PTS-onset from pile driving at the SW WTG array location with harbour porpoise densities estimates. For further information on densities used; see Table 6.6.

Piling Scenario	Piling location and Monopile diameter (m)		Density (animals/km²)	Area (km²)	Maximum range (m)	Number of animals[1,2]	Percentage of reference population[2] (%)
Instantaneous PTS-onset (unweighted SPL_{peak})							
Ramp-up mitigation scenario	SW WTG	11 m	0.38	0.89	580	<1	<0.01
			0.2803			<1	<0.01
			0.116527			<1	<0.01
Extended ramp-up mitigation scenario	SW WTG	11 m	0.38	0.9	580	<1	<0.01
			0.2803			<1	<0.01
			0.116527			<1	<0.01
Cumulative PTS-onset (weighted SEL_{cum})							
Ramp-up mitigation scenario	SW WTG	11 m	0.38	2.8	1,500	1	<0.01
			0.2803			1	<0.01

			0.116527			<1	<0.01
Extended ramp-up mitigation scenario	SW WTG	11 m	0.38	<0.01	<50	<1	<0.01
			0.2803			<1	<0.01
			0.116527			<1	<0.01

[1]The predicted number of individuals exposed to PTS-onset (both instantaneous and cumulative) from pile driving is fewer than one animal across all density scenarios. Importantly, the maximum PTS-onset impact range falls entirely within the 1,000 m Rsafe mitigation distance. With the implementation of the extended ramp-up mitigation procedure and associated MMMP measures (monitoring and soft-start procedures), marine mammals are expected to be displaced from the impact area prior to the onset of full hammer energy. Consequently, no animals are expected to be exposed to sound levels capable of causing auditory injury (PTS).

[2]The number of animals disturbed and the reference population are representative of the Celtic and Irish Sea MU population (IAMMWG, 2023). The number of animals disturbed is not representative of the numbers disturbed within the Blackwater Bank SAC.

6.4.1.30 Impact pile driving generates impulsive underwater noise, with most acoustic energy occurring between 30 – 500 Hz, peaking between 100 - 300 Hz, and with energy extending above 2 kHz (Kastelein *et al.*, 2015; Kastelein *et al.*, 2016). Studies indicate that auditory injury in harbour porpoise arising from piling noise is most likely to occur where the source frequencies overlap with species' peak hearing sensitivity, rather than across the whole hearing spectrum (Kastelein *et al.*, 2013a).

6.4.1.31 ~~6.4.1.4~~ With consideration of the risk and impacts of auditory injury, all species of cetaceans rely on ~~sonar~~acoustic cues for navigation, ~~finding~~ prey detection and communication (Southall *et al.*, 2007). The ecological consequences of PTS (a permanent and irreversible hearing impairment) are uncertain~~, although a loss of hearing could affect~~; however, potential effects could include impairment of key life functions such as communication, predator detection, foraging, mating and maternal fitness, ~~and could lead to a change in an animal's~~potentially influencing an individual's health or vital rates ~~(Erbe *et al.*, 2018). Relating a potential loss in hearing to a biologically significant response is challenging due to a paucity of empirical data, however a potential consequence of a disruption in key life functions is that the health of impacted animals would deteriorate~~ and potentially lead to reduced birth rate in females and mortality of individuals~~.~~ (Erbe *et al.*, 2018). Linking hearing impairment directly to biologically significant population-level effects remains challenging due to a paucity of empirical evidence.

6.4.1.32 ~~6.4.1.5 At a~~Despite harbour porpoises' potential sensitivity to auditory injury, a UK Department of Business, Energy, and Industrial Strategy (BEIS)-funded expert elicitation workshop ~~in 2018, experts discussed the nature, extent, and potentially consequences of PTS to marine mammal species in the UK (Booth and Heinis, 2018). Using the best and most recent data available on the effects of PTS on marine mammals, the experts~~ concluded that PTS ~~did not mean animals were deaf, and~~, when confined to a narrow frequency band, does not equate to deafness and is unlikely to result in biologically significant effects on survival and reproduction recognising that both the magnitude and frequency ~~band in which PTS occurs is~~range of any threshold shift are critical ~~to~~when assessing ~~the effect~~potential effects on vital rates~~.~~ (Booth *et al.*, 2019; Kastelein *et al.*, 2017). With consideration that TTS, by definition is temporary and reversible, therefore this is considered to pose a negligible risk to individual survivability or reproductive success.

6.4.1.33 ~~6.4.1.6 Exposure to loud underwater noises can lead to a reduction in hearing sensitivity which may be temporary (TTS) or permanent (PTS). PTS is defined by Southall *et al.* (2007) as a non-recoverable elevation of the hearing threshold of 6 dB. It has been assumed that PTS-onset occurs after TTS has grown to 40 dB, based on TTS growth rates obtained from scientific literature. Studies of auditory injury in relation to a typical piling sequence have suggested that hearing impairment caused by exposure to piling noise is likely to occur where the source frequencies overlap the range of peak sensitivity for the receptor species rather than across the whole frequency hearing spectrum (Kastelein *et al.*, 2013a). For piling noise, most energy is between ~30 – 500 Hz, with a peak between 100-300 Hz and energy extending above 2 kHz (Kastelein *et al.*, 2015; Kastelein *et al.*, 2016). Studies have shown~~Experimental and field studies demonstrate that exposure to impulsive pile driving noise ~~induces~~may induce TTS in harbour porpoise within a relatively narrow frequency band ~~in harbour porpoise~~ (Finneran, 2015), with statistically significant ~~TTS~~effects occurring at 4 and 8 kHz~~, respectively~~ (Kastelein *et al.*, 2016) and centred at 4 kHz (Kastelein *et al.*, 2012a; Kastelein *et al.*, 2012b; Kastelein *et al.*, 2013b; Kastelein *et al.*, 2017). ~~As a result, at an~~Drawing on the same expert elicitation workshop, it was ~~agreed~~concluded that any pile-driving-related threshold shifts ~~to hearing caused by pile driving~~ would manifest ~~in~~primarily within the ~~range of~~ 2 – 10 kHz ~~(Kastelein *et al.*, 2017). It was also agreed~~range, and that a PTS of 6 – 18 dB ~~in a narrow frequency~~within this band ~~in the 2 – 10 kHz region~~ is unlikely to significantly affect ~~the~~an individual's ability ~~of individuals~~ to survive and reproduce (Kastelein *et al.*, 2017).

~~6.4.1.7 Despite harbour porpoises' potential sensitivity to PTS and TTS, in Booth and Heins (2018) they concluded that the probability of PTS significantly affecting the survival and reproduction of~~

~~harbour porpoises is very low. With consideration that TTS is temporary, this poses an entirely negligible risk of impacting survivability and reproduction.~~

~~6.4.1.8 With regards to underwater noise produced by UXO clearance, there are two activities that produce noise, higher order detonation, and low-order clearance methods. It is unknown if there are UXO that require clearance at the time of this assessment, and therefore is unknown to what level of clearance will be carried out. Therefore, this assessment is based on high-order UXO clearance being carried out which is viewed as the worst-case scenario in terms of underwater noise generation.~~

~~6.4.1.9 The main underwater noise produced by high-order detonation is outside of the region of greatest sensitivity for harbour porpoise (Southall *et al.,* 2019), and there is a pronounced reduction in energy levels above ~5-10 kHz (von Beckmann *et al.*, 2015 and Salomons *et al.*, 2021). Due to this, with consideration of the above sensitivity, it is concluded that harbour porpoises have a low sensitivity to this effect.~~

~~6.4.1.10 With regards to underwater noise produced by geophysical surveys, exact surveys and equipment is yet to be decided, therefore as a precautionary approach we have considered all types of noise generation from the varied survey types. Surveys such as multibeam EchoSounder (MBES) and side scan sonar (SSS) produce sounds which are sonar based and impulsive. Surveys comprising of vibrocoring typically produce non-implusive sound. The equipments noise source levels is provided in~~ Table 6.~~9 and Table 6.10.~~

~~**and equipment, with indicative source levels.**~~

6.4.1.34 Furthermore, the Developer has committed to the implementation of the project-specific MMMP (NIS Volume III, Appendix 25.2: Marine Mammal Mitigation Plan) during piling activities in accordance best practice, including DAHG (2014) guidance, to minimise the risk of auditory injury (PTS) to marine mammals (Table 6.7).

6.4.1.35 In relation to the site-specific COs for Blackwater Bank SAC (Table 5.1), the potential effects of underwater noise associated with pile driving on harbour porpoise have been assessed with respect to the attributes of access to suitable habitat and disturbance.

6.4.1.36 Regarding access to suitable habitat attribute, pile driving activities and the associated underwater noise (which could potentially cause auditory injury) will be short-term and temporary in nature and will not result in permanent habitat exclusion. Predicted PTS-onset impact ranges (maximum of 1.5 km) are substantially smaller than the distance to Blackwater Bank SAC, which is located approximately 20.03 km from the closest piling location (WT43; Project Design Option 2), and therefore do not overlap the SAC boundary. As such, harbour porpoises within the SAC will not be exposed to levels of underwater noise capable of resulting in auditory injury. Any highly unlikely auditory injury to individuals occurring outside the SAC would not impede access to suitable habitat within the site.

6.4.1.37 Regarding the disturbance attribute, even in the highly unlikely event that an individual experienced PTS-onset, available evidence indicates that would be unlikely to significantly affect individual fitness (i.e. its ability to survive and reproduce; Kastelein *et al.*, 2017). Therefore, pile driving activities are not expected to introduce man-made energy at levels capable of causing significant negative effects on individual harbour porpoises or the wider community associated with, or connected to, Blackwater Bank SAC, nor is it expected to cause injury or mortality at levels capable of affecting site integrity.

6.4.1.38 **With consideration of the implementation of the extended ramp-up scenario and project-specific MMMP measures ensuring that no animals are within the area of predicted auditory injury (PTS-onset) ranges, the absence of overlap with the SAC (with the greatest predicted impact range of up to 580 m), and the negligible proportion of the wider MU potentially affected (<0.01%), it is therefore concluded there will be no AEoI of the harbour porpoise QI of the Blackwater Bank SAC, as defined by its site-specific COs, as a result of**

auditory injury due to underwater noise associated with piling for Project Design Option 1.

6.4.1.39 **Based on the representative risk of effect of Project Design Option 1, it can be is concluded that no AEoI would also apply to Project Design Option 2.**

BEHAVIOURAL DISTURBANCE

6.4.1.40 The number of harbour porpoise predicted to experience behavioural disturbance as a result of pile driving during construction is presented in Table 6.~~9: Underwater noise produced by geophysical survey techniques~~11. Disturbance was quantified using the dose-response relationship for impulsive noise developed by Graham *et al.* (2019) and expressed as a proportion of the relevant reference population (Table 6.6) for individual piling events at representative locations within the Proposed Development.

6.4.1.41 As the dose-response assessment is based on SEL_{ss}, only the maximum hammer energy has been considered in the disturbance assessment. SEL_{ss} applies to a single strike rather than cumulative exposure over time, and therefore is calculated using the highest energy strike. As the maximum hammer energy (3,500 kJ) is identical for both the ramp-up mitigation and extended ramp-up mitigation scenarios, therefore, predicted behavioural disturbance under the extended ramp-up mitigation scenario is equivalent to that of the ramp-up mitigation scenario assessment. For avoidance of doubt, the conclusion of the behavioural disturbance assessment is based on the extended ramp-up mitigation scenario, as it has been committed to by the Applicant.

6.4.1.42 Using the uniform density estimate of 0.2803 animals/km^2 from the wider SCANS-IV surveys, a maximum of 1,293 harbour porpoise (2.07% of the reference MU population) may experience behavioural disturbance as a result of pile driving of an 11 m monopile at the SW WTG location, which represents the piling location closest to Blackwater Bank SAC (Table 6.~~9: Underwater noise produced by geophysical survey techniques~~11). While this density estimate is considered more appropriate for large spatial scales than the site-specific DAS density, it assumes a uniform distribution of animals across the Irish Sea and is therefore precautionary.

Table 6.~~9: Underwater noise produced by geophysical survey techniques~~11: Predicted impact of disturbance to harbour porpoise from pile driving at SW WTG location using dose-response curves. For further information on densities used; see Table 6.6

~~Survey type~~Piling Scenario	~~Equipment type~~ ~~SEL~~Piling location and Monopile diameter (~~unweighted) (dB re 1µPa^{2}s @1~~ m)		~~SPL$_{rms}$ T90 (dB re 1µPa @1~~ ~~m~~Density (animals/km^2)	Number of animals disturbed[1]	~~SPL$_{pk}$ (dB re 1µPa @ 1 m~~Percentage of reference population[1] (%)
~~Non-impulsive sonar-based surveys / equipment~~ Ramp-up mitigation and extended ramp-up	SW WTG	11 m	0.38	1,753	2.80

mitigation scenario					
~~Multibeam EchoSounder (MBES)~~	~~Konsberg EM2040 or Reason Seabat 7125~~		~~N/A~~	~~213~~	~~N/A~~
~~Side scan sonar (SSS)~~	~~Edgetech FS4200 or Klein 5000~~	~~N/A~~	~~210~~0.2803	1,293	~~N/A~~2.07
~~Sub-bottom profiler (SBP)~~	~~Innomar SES Standard / Medium or Applied Acoustics AA251 or Edgetech 6205S~~	~~N/A~~	~~245~~0.116527	538	~~N/A~~0.86
~~**Impulsive surveys / equipment**~~[1] *The number of animals disturbed and the reference population are representative of the Celtic and Irish Sea MU population (IAMMWG, 2023). The number of animals disturbed is not representative of the numbers disturbed within the Blackwater Bank SAC.*					
~~Seismic refraction~~	~~TI sleeve 10CU~~		~~195~~	~~214~~	~~224~~
~~Sparker (2DUHRS and 3DUHRS)~~	~~Geosource 200 – 400~~		~~182~~	~~214~~	~~219~~

~~**geotechnical surveys and source levels**~~

~~**Table 6.10: Underwater noise produced by geotechnical survey techniques**~~

~~**Survey type**~~	~~**Source level (dB re 1µPa re 1 m (peak)**~~	~~**Source SEL (dB re 1 µPa²s re 1 m) (unweighted)**~~	~~**SPL rms T90**~~
~~Seismic Cone Penetration Test (CPT)~~[1]	~~220~~	~~189~~	~~203~~
~~Vibrocore~~	~~190~~	~~223~~[2]	~~187~~
~~Grab sample~~	~~N/A~~	~~N/A~~	~~N/A~~

[1]Equipment is pushed into the seabed and therefore would not result in a measurable noise source.

[2]Based on one hour of operation for a single core sample.

6.4.1.11 A study by Lucke *et al.* (2009) indicated that TTS could be induced in harbour porpoise at 350 m when exposed to an airgun impulse at a peak pressure of 200 dB_{pk-pk} re 1 µPa with corresponding SEL of 164.5 dB re $\mu Pa^2{}_s$) in shallow waters (~4 m), however this study is highly conservative as it assumes that the animal would remain stationary throughout the exposure. Evidence from other studies suggests that harbour porpoises exposed to such noise sources would likely move away from the source, and therefore leave the impact range of PTS-onset (Hermannsen *et al.*, 2015). Furthermore, it is expected that vessel presence will act as a deterrent to harbour porpoise, reducing the risk of auditory injury (Benhemma-Le Gall *et al.*, 2023). Therefore, it is highly unlikely that harbour porpoise will be present in the immediate vicinity at the start of any survey activity.

6.4.1.12 While PTS is a permanent effect which cannot be recovered from, the most likely response of a marine mammal to noise levels that could induce TTS is to flee the area (Southall *et al.*, 2007). Therefore, animals exposed to these noise levels that could induce TTS are likely to actively avoid hearing damage by moving away from the source.

6.4.1.43 The 120 dB SEL_{ss} re 1 μPa^2s to 150 dB SEL_{ss} re 1 μPa^2s disturbance contours are predicted to overlap with the Blackwater Bank SAC (Figure 6.13). However, the probability of an individual responding at these outer contours is relatively low, of 1.2-50.9%, indicating that at least half of the animals within the SAC would not respond to noise levels predicted within the site.

6.4.1.44 An additional approach for the assessment of potential behavioural disturbance of harbour porpoise from piling is the Effective Deterrence Range (EDR) (JNCC, 2025). EDRs provide an empirically-derived estimate of the spatial extent over which the bulk of the disturbance response by harbour porpoises will occur, though they do not correspond to complete avoidance and may overestimate the distances at which effects are consistently observed (JNCC, 2025; JNCC, 2020). For monopile installation without noise abatement systems, reported EDRs vary, with most studies indicating ranges of 15–20 km, with a weighted average of 17.4 km based on 14 studies (Brown *et al.,* 2025). A recent study included in the Brown *et al.* (2025) review was from Moray West, which observed an EDR of 9.4 km, highlighting that the 20 km EDR recommended by JNCC is precautionary. To note, the approach taken by JNCC (2025) to calculating EDRs is precautionary as they represent the maximum disturbance response typically recorded at the start of the piling campaign. The disturbance distance of harbour porpoise is predicted to decrease over the duration of the piling campaign, as evidence by Graham *et al.* (2019).

6.4.1.45 Blackwater Bank SAC is 19.70 km from the Proposed Development at its closest point to the Array Area, however the minimum distances to the nearest indicative piling locations are 20.11 km (WT53; Project Design Option 1) or 20.03 km (WT43; Project Design Option 2). These distances fall beyond the upper limit of published EDRs for unabated monopile installation (20 km; JNCC, 2025). As such, there is no overlap between the SAC and the EDR or the range over which the bulk of the harbour porpoise disturbance response is expected. Therefore, disturbance to harbour porpoise within the SAC is likely to be minimal as a result of foundation installation for the Proposed Development.

6.4.1.46 For a comparison across modelled piling locations, the highest predicted level of behavioural disturbance corresponds to the C WTG location, with a precautionary maximum of 1,908 harbour porpoises (3.05% of the reference MU population) predicted to experience behavioural disturbance under the highest population density assumptions. This estimate represents a conservative upper-bound and is therefore taken forward for the in-combination quantitative assessment (see Section 7.4.2).

6.4.1.47 Potential behavioural disturbance to Annex II marine mammal QIs arising from pile driving has been considered within the project-specific MMMP (NIS Volume III, Appendix 25.2: Marine

Mammal Mitigation Plan). While primarily designed to minimise the risk of auditory injury (PTS) to cetaceans from piling-related underwater noise, the MMMP will also act to reduce the magnitude and spatial extent of behavioural disturbance. Measures such as pre-piling monitoring, controlled ramp-up of piling activities and adherence to recognised best-practice noise management protocols will limit exposure of cetaceans to the highest sound levels and reduce the likelihood of strong avoidance or displacement responses. The implementation of the MMMP therefore provides an additional layer of precaution in relation to disturbance effects, ensuring that any behavioural responses that do occur are temporary and reversible in nature and do not undermine the relevant site-specific COs (Table 6.7).

6.4.1.48 Furthermore, iPCoD modelling was conducted to determine whether the level of disturbance is expected to result in population level impacts under either Project Design Option 1 or 2. The results of the iPCoD modelling show that there is no significant effect of disturbance resulting from pile driving at the Proposed Development to harbour porpoise, with the impacted population predicted to continue at a stable trajectory at 99.90-99.93% of the un-impacted population up to 24 years after piling has ceased. The outputs of the iPCoD modelling are considered precautionary and applicable to the revised Project Design Options, as the original assessment was based on a greater number of WTGs and greater piling parameters (e.g. maximum hammer energy of 6,000 kJ was modelled in iPCoD while 3,500 kJ is now the maximum). Consequently, the iPCoD modelling provides a representative and precautionary basis for evaluating population-level effects of pile driving under the current design (see NIS, Volume III, Appendix 11.3: Phase 1 Irish Offshore Windfarms: Cumulative iPCoD Modelling for full list of modelling limitations and assumptions).

6.4.1.49 With consideration of the risks and impacts of disturbance and behavioural change, harbour porpoises are particularly vulnerable to disturbance due to their small body size, high metabolic rate and limited capacity for energy storage, requiring frequent foraging to meet energetic demands (Rojano-Doñate *et al.*, 2018; Wisniewska *et al.*, 2016). As such, displacement from high-quality foraging habitat or reduced foraging efficiency has the potential to affect an individuals fitness if animals are unable to compensate. However, studies using Digital Acoustic Recording Tags (DTAGs) suggest that harbour porpoises may exhibit some resilience to short-term reductions in food intake and are capable of compensatory behavioural responses (Wisniewska *et al.*, 2016).

6.4.1.50 ~~6.4.1.13~~ Monitoring data collected during the construction of offshore windfarms have shown that harbour porpoise detections around the pile driving area often decline for several hours prior to the commencement of pile driving, likely due to increased other construction-related activity and the presence of vessels in advance of pile driving (Benhemma-Le Gall *et al.*, 2021; Benhemma-Le Gall *et al.*, 2023; Brandt *et al.*, 2018; Graham *et al.*, 2019). For example, during the installation campaigns of both Beatrice and Moray East offshore windfarms, ~~harbour porpoise~~ acoustic detections gradually declined by up to 33% ~~during~~in the 48-~~hour period prior to piling~~hours preceding pile driving (Benhemma-Le Gall *et al.*, 2023). ~~It is assumed that this is due to an increase in other construction-related activities and the presence of vessels in advance of pile driving which act as a deterrent to~~This pre-emptive displacement reduces the likelihood of harbour porpoise~~,~~ being present in the immediate vicinity of the piling location at the onset of the activity and therefore reducing the risk of auditory injury (Benhemma-Le Gall *et al.*, 2023). ~~Therefore, it is highly unlikely that harbour porpoise will be present in the immediate vicinity of the pile driving at the start of the activity. Consequently, the assessment of underwater noise in relation to pile driving, which assumes harbour porpoises will be present in the immediate vicinity during pile driving, is extremely precautionary.~~

~~6.4.1.14 With consideration of the risks and impacts of disturbance and behavioural change harbour porpoises are particularly vulnerable to disturbance because they are small cetaceans which makes them susceptible to heat loss and as a result, requires them to forage frequently in order to maintain a high metabolic rate with little energy remaining for fat storage (Rojano-Doñate *et*~~

~~*al.*, 2018; Wisniewska *et al.*, 2016). Therefore, there is a risk of changes to their overall fitness if they are displaced from high-quality foraging grounds or if their foraging efficiency is disturbed, and they are unable to find alternative suitable foraging grounds that will provide sufficient food to meet their metabolic needs. However, results from studies using Digital Acoustic Recording Tags (DTAGs) suggest that harbour porpoises are able to respond to short-term reductions in food intake and may have some resilience to disturbance (Wisniewska *et al.*, 2016).~~

6.4.1.51 ~~6.4.1.15 As established in Section 6.4.1.50, harbour porpoises are displaced by piling activities. However, the same studies further establishing that likelihood of displacement diminished~~While pile driving may result in temporary behavioural disturbance and displacement, evidence indicates that the magnitude of response typically diminishes over the construction period (Graham *et al.*, 2019), ~~which supports~~supporting the conclusion that ~~these~~disturbance effects are ~~temporary and~~ short-term and ~~therefore negligible.~~

~~6.4.1.16~~ reversible. Furthermore, ~~Recent~~ studies at two offshore windfarms in Scotland showed that detections of echolocation clicks~~, associated with echolocation,~~ and buzzing~~,~~ associated with prey capture~~, in~~ continued within the short range (2 km) ~~did not cease in response to~~of piling locations, suggesting that harbour porpoises were not completely displaced from the ~~piling~~affected area (Benhemma-Le Gall *et al.*, 2021). Furthermore, the study suggests that animals that experience displacement may be able to compensate for missed foraging opportunities and increased energy expenditure of fleeing the piling area as detections of both clicks and buzzing were positively related to the distance from the piling activity (Benhemma-Le Gall *et al.*, 2021) which could be due to an increase in foraging activities beyond the piling impact range.

~~6.4.1.17 At an~~ Expert elicitation ~~workshop in 2019, experts agreed~~further concluded that juvenile and adult survival ~~were~~is unlikely to be significantly affected by missed foraging opportunities as a result of piling-related disturbance ~~from piling~~ (Booth *et al.*, 2019).

~~6.4.1.18 Available guidance on assessing the significance of noise disturbance from UXO detonation against the conservation objectives of SACs with harbour porpoise as qualifying interests within England, Wales and Northern Ireland recommend an effective deterrence range (EDR) of 26 km for high-order detonations (JNCC, 2020). It should be noted that this EDR is based upon avoidance from piling, not UXO clearance, and the same guidance states that '*a one off explosion would probably only elicit a startle response and would not cause widespread and prolonged displacement*'. With consideration of the resilience of the species highlighted above, it is concluded that harbour porpoise are not sensitive to UXO clearance behavioural disturbance effects when considering the integrity of the designated site.~~

6.4.1.52 In relation to the site-specific COs for Blackwater Bank SAC (Table 5.1), the potential effects of underwater noise associated with pile driving on harbour porpoise have been assessed with respect to the attributes of access to suitable habitat and maintain human activities below levels which would adversely affect the harbour porpoise community at the site (disturbance).

6.4.1.53 While underwater noise generated from piling may result in temporary displacement of harbour porpoise, any behavioural response is expected to be limited to the period of piling, with individuals returning to affected areas within one to two days (Brandt *et al.*, 2016). In line with NPWS guidance (2024a), such temporary disturbance does not constitute a permanent barrier to habitat use of the site (due to the temporary nature of the activity) and will not permanently prevent harbour porpoises accessing suitable habitat within the SAC.

6.4.1.54 Some individuals within or associated to Blackwater Bank SAC may experience disturbance and temporary displacement as a result of pile driving. However, this is not predicted to result in mortality, injury, or significant negative effects on individual fitness or reproductive success for any life stage, nor is it expected to ultimately affect the harbour porpoise community at the site.

6.4.1.55 **With consideration of the precautionary nature of the assessment, the low proportion of the population predicted to exhibit a behavioural response (based on dose-response curves), the small overlap between published disturbance ranges (Brown *et al.,* 2025) and the SAC, the inclusion of mitigation measures, and the recoverable and temporary (although repeated) nature of behavioural disturbance, it is therefore concluded there will be no AEoI of the harbour porpoise QI of the Blackwater Bank SAC, as defined by its COs, as a result of behavioural disturbance due to underwater noise during pile driving for Project Design Option 1.**

6.4.1.56 **Based on the representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

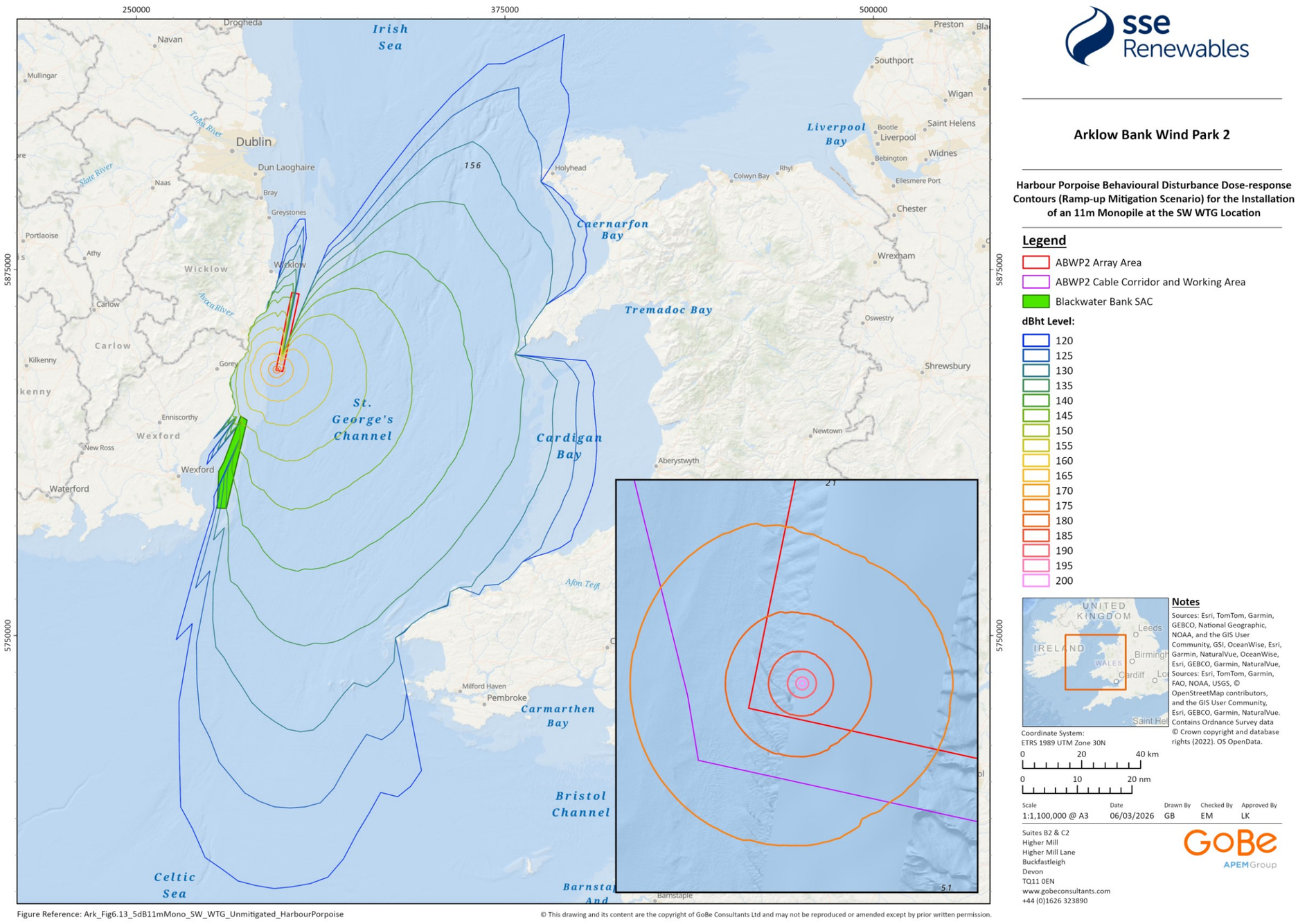


Figure 6.13: Behavioural disturbance dose-response contours (ramp-up mitigation scenario) for the installation of an 11 m monopile at the SW WTG location and Blackwater Bank SAC for harbour porpoise QI

INJURY AND/OR DISTURBANCE FROM UNDERWATER NOISE FROM UXO CLEARANCE

6.4.1.57 UXO items with a range of charge weights (or quantity of contained explosive) may be present within the boundaries of the Proposed Development. As such, there is potential for UXO clearance to be required prior to construction. Where UXO is identified, clearance may involve avoidance, relocation, or removal. However, in some cases, underwater detonation may be required where it is deemed unsafe or impracticable to remove or relocate the UXO.

6.4.1.58 UXO clearance can generate underwater noise through either high order detonation, whereby the main explosive charge detonates, or low order clearance (deflagration), whereby a donor or shaped charge initiates partial combustion of the explosive without full detonation. At the time of this assessment, the presence, type, location, and clearance method of any UXO within the Proposed Development are unknown. Therefore, this assessment considers high order detonation, as it represents the scenario with the greatest potential for underwater noise generation.

6.4.1.59 The number of UXO items that may require clearance and the duration of UXO clearance operations are currently unknown. Therefore, the UXO-related assessments presented herein are illustrative and precautionary, ensuring that the potential range of effects on Annex II marine mammal QIs during the construction phase of the Proposed Development is fully considered. If clearance is required, activities are expected to consist of a limited number of discrete, short-duration events.

6.4.1.60 The severity of the potential consequences of UXO detonation depends on several variables, including, but not limited to, the explosive charge weight and its proximity to the receptor. Potential effects of underwater detonation of UXOs on marine mammals include auditory injury from exposure to the acoustic shock wave, resulting in permanent auditory injury or loss in hearing sensitivity (PTS), or temporary loss in hearing sensitivity (TTS); and behavioural disturbance which could impact on feeding, mating, breeding, and/or resting activities (Ketten, 2004; Richardson *et al.,* 1995; von Benda-Beckmann *et al.*, 2015).

6.4.1.61 ~~6.4.1.19 The assessment has been informed by~~Underwater noise levels generated from UXO clearance were predicted by Subacoustech Environmental Ltd for the Underwater Noise Assessment ~~by Subacoustech (~~(NIS Volume III, Appendix 11.1~~) which includes the results of numerical modelling using the INSPIRE~~: Underwater Noise ~~model.~~Assessment). Full details of the underwater noise modelling and resulting impact ranges are detailed in NIS Volume III, Appendix 11.1: Underwater Noise Assessment.

~~CONSTRUCTION AND DECOMMISSIONING~~

~~6.4.1.20 Piling will only be carried out during the construction phase of the Proposed Development. Based on calculations and data presented in Table 6.11 it is calculated that the maximum instantaneous PTS-onset impact range was 750 m (11 m monopile in the south-west (SW) location), with other piling locations having a reduced range. Based on this calculation this equates to a maximum of one harbour porpoise experience auditory injury (based on worst-case-scenario densities). The cumulative PTS-onset thresholds maximum impact range is 10,000 m (11 m monopile in the SW, or 14 m monopile in the S-OSP). Based on this calculation this equates to a maximum of 68 animals experience auditory injury (based on worst-case-scenario densities).~~

UXO ASSESSMENT METHODOLOGY

6.4.1.62 A range of potential UXO explosive sizes was modelled to reflect the types of ordnance that could plausibly be encountered. Charge weights (TNT equivalent) of 25, 55, 120, 240, 525, 700, and 800 kg were assessed. In each case, it was assumed that maximum explosive charge was present and detonated, with an additional donor charge of 0.5 kg being included to initiate detonation.

6.4.1.63 Low order deflagration has also been assessed, which assumes that the donor or shaped charge (charge weight of 0.5 kg) detonates fully to initiate a burnout of the explosive but without the follow-up detonation of the UXO. No mitigation has been considered within the modelling.

6.4.1.64 UXO detonation was modelled as a single impulsive noise event, with SEL_{cum} equivalent to SEL_{ss}. Estimation of the source noise level for each charge weight has been carried out in accordance with the methodology of Soloway and Dahl (2014) and are presented in Table 6.12.

Table 6.12: Unweighted SPL_{peak} and SEL_{ss} source levels used for UXO modelling

Charge weight (kg; TNT equivalent)	SPL_{peak} source level (dB re 1 µPa at 1 m)	SEL_{ss} source level (dB re 1 $\mu Pa^2{}_s$ at 1 m)
0.5 (low order)	272.1	217.1
25 + donor	284.9	228.0
55 + donor	287.5	230.1
120 + donor	290.0	232.3
240 + donor	292.3	234.2
525 + donor	294.8	236.4
700 + donor	295.8	237.2
800 + donor	296.2	237.5

APPROACH TO PTS AND TTS-ONSET

6.4.1.65 The PTS-onset thresholds used to assess the potential for auditory injury to marine mammals during UXO clearance are those presented in Southall *et al.* (2019) for impulsive noise (Table 6.9) as it is currently advised by UK SNCBs (Natural England and the Marine Management Organisation) that these thresholds should be used for impact assessment from UXO detonation on marine mammals. This has been followed within this assessment as the most appropriate alternative given that Irish-specific guidance on UXO detonation does not exist. However, the suitability of these criteria is currently being discussed because there a lack of empirical evidence regarding UXO detonations using these metrics, particularly, the range-dependent characteristics of the peak sounds, and whether current propagation models can accurately predict the range at which these thresholds are reached.

6.4.1.66 Although TTS-onset thresholds for impulsive noise are also presented in Table 6.9, TTS is not considered as injury given its temporary nature. Therefore, any potential effects associated with TTS are considered to be captured within the quantitative assessment of disturbance.

BEHAVIOURAL DISTRUBANCE FROM UXO CLEARANCE ASSESSMENT METHODOLOGY

6.4.1.67 Both pile driving and explosive sound sources are categorised as impulsive noise; however, the number of pulses and overall duration of noise emission that drive behavioural response differ drastically between the two activities. Behavioural responses to a single UXO detonation are expected to comprise a brief startle response or short-term aversive behaviour, whereas pile driving involves a prolonged series of impulses that can result in sustained displacement from an area, enabling a dose-response to be quantified. As such, the empirically-derived dose-response curves used for assessment of behavioural disturbance for pile driving are not applicable to the assessment of UXO clearance.

6.4.1.68 There is currently no national guidance available on the appropriate methodology for assessing behavioural disturbance arising from UXO clearance. In the absence of Irish-specific guidance, available guidance from England, Wales, and Northern Ireland on assessing the significance of noise disturbance from UXO detonation in relation to the COs of SACs with harbour porpoise as QIs has been applied (JNCC, 2025). This guidance recommends the use of an EDR of 20 km for high-order detonations and an EDR of 5 km for low order UXO clearance.

HIGH ORDER CLEARANCE

6.4.1.69 The 20 km EDR assumes that all animals within this radius are potentially disturbed and has been applied to all marine mammal species for high order UXO detonations. This precautionary radius reflects the absence of species-specific quantitative disturbance metrics and limited empirical data on likelihood of behavioural responses to underwater explosions.

6.4.1.70 It is important to note that the behavioural disturbance from a single UXO detonation is expected to be brief and localised, reflecting the highly limited duration and frequency of the event (JNCC, 2020). Furthermore, there is no direct evidence to support the assumption that all marine mammal species will respond in the same way to a high order UXO clearance (Dähne *et al.*, 2013).

6.4.1.71 The recommended 20 km EDR is derived from the literature review by Majewska *et al.* (2025) and using data from van Geel *et al.* (2024) based on UXO detonations during construction of the East Anglia ONE OWF where a total of 81 high order UXO detonations recorded reduced harbour porpoise presence and acoustic activity up to a distance of 20 km from UXOs weighing between 101 and 250 kg NEQ. Majewska *et al.* (2025) recommended a high order UXO clearance EDR of 15-20 km, based on charge weights up to 263 kg, as that is the maximum charge weight cleared in the unpinning evidence base. However, given the remaining uncertainties in the empirical evidence, the UK SNCB's advice is to use the upper end of that range (i.e. 20 km).

6.4.1.72 In this assessment, the area encompassed by the 20 km EDR was reviewed with respect to the location of land relative to the Proposed Development. The 20 km EDR represents a radial distance at-sea, therefore, land mass within the radius is not considered in the calculation of area of potential disturbance. Assuming a high order detonation in the southeastern sector of the Array Area provides a precautionary scenario with minimal land overlap. Accounting for this, the maximum at-sea area within the 20 km EDR is 1,159.98 km², representing a slight

reduction compared to the total area within the 20 km EDR if fully at-sea. This 1,159.98 km² area has been used in the quantitative assessment of high order UXO clearance.

LOW ORDER CLEARANCE

6.4.1.73 For low order clearances, available guidance recommends the use of a reduced EDR of 5 km to define the area of potential disturbance around the source location (JNCC, 2025). This assumes that all marine mammal species within a radius of 78.54 km^2 are disturbed and reflects the substantially lower acoustic energy associated with low order clearance compared to high order detonation.

6.4.1.74 This recommended 5 km EDR is well-supported by evidence from sound measurement studies, which includes six studies comprising of 166 clearance events (Majewska *et al.,* 2025).

CONSTRUCTION PHASE ASSESSMENT

AUDITORY INJURY (PTS)

6.4.1.75 ~~6.4.1.21 With regards to UXO clearance,~~ Based on the modelling results presented in Table 6.~~12~~13Table 6.~~12~~13, the maximum PTS-onset ~~impact~~ range ~~is 14 km.~~for harbour porpoise resulting from high order UXO clearance is 14 km, based on the unweighted SPL_{peak} criterion and the largest charge weight modelled (800 kg plus donor). Using the regional SCANS-IV density estimate, this would result in up to ~~234~~173 harbour porpoise, (~~0.37~~representing 0.28% of the MU reference population) ~~experiencing PTS from a high-order detonation with the greatest charge weight~~being within PTS-onset range under the most precautionary scenario.

6.4.1.76 For low order clearance, the predicted PTS-onset ranges are substantially smaller, with a maximum range of 1.2 km (Table 6.~~12~~13). At this range, the number of harbour porpoises predicted to experience PTS is one individual (<0.01% of the MU reference population).

Table 6.11: PTS-onset from pile driving and disturbance at array locations with harbour porpoise densities estimates

Piling location and Monopile		Site specific DAS density estimate/ SCANS-IV density estimate (animals/km²)	Area (km²)	Maximum range (m)	Number of animals	% of reference population
Instantaneous PTS-onset (unweighted SPL_{peak})						
NW	7 m	0.38 / 0.2803	0.70	490	<1	<0.01
	11 m		0.73	500	<1	<0.01
C	7 m	0.38 / 0.2803	1.5	690	1 / <1	<0.01
	11 m		1.5	700	1 / <1	<0.01
SW	7 m	0.38 / 0.2803	1.6	740	1 / <1	<0.01
	11 m		1.6	750	1 / <1	<0.01
N-OSP	7 m	0.38 / 0.2803	1	570	<1	<0.01
	14 m		1	580	<1	<0.01

Piling location and Monopile		Site specific DAS density estimate/ SCANS-IV density estimate (animals/km²)	Area (km²)	Maximum range (m)	Number of animals	% of reference population
S-OSP	7 m	0.38 / 0.2803	1.4	670	1 / <1	<0.01
	14 m		1.4	680	1 / <1	<0.01
Cumulative PTS onset (weighted SEL_{cum})						
NW	7 m	0.38 / 0.2803	31	4,600	12 / 9	0.02 / 0.01
	11 m		31	4,600	12 / 9	0.02 / 0.01
C	7 m	0.38 / 0.2803	150	9,100	57 / 42	0.09 / 0.07
	11 m		150	9,100	57 / 42	0.09 / 0.07
SW	7 m	0.38 / 0.2803	180	10,000	68 / 50	0.11 / 0.08
	11 m		180	10,000	68 / 50	0.11 / 0.08

Piling location and Monopile		Site specific DAS density estimate/ SCANS-IV density estimate (animals/km²)	Area (km²)	Maximum range (m)	Number of animals	% of reference population
N-OSP	7 m	0.38 / 0.2803	49	5,400	19 / 14	0.03 / 0.02
	14 m		49	5,400	19 / 14	0.03 / 0.02
S-OSP	7 m	0.38 / 0.2803	170	10,000	65 / 48	0.10 / 0.08
	14 m		170	10,000	65 / 48	0.10 / 0.08
Predicted disturbance						
NW	7 m	0.38 / 0.2803	-	-	1,933 / 1,426	3.09 / 2.28
	11 m		-	-	1,951 / 1,439	3.12 / 2.30
C	7 m	0.38 / 0.2803	-	-	3,117 / 2,299	4.99 / 3.68
	11 m		-	-	3,111 / 2,295	4.98 / 3.67

Piling location and Monopile		Site specific DAS density estimate/ SCANS-IV density estimate (animals/km²)	Area (km²)	Maximum range (m)	Number of animals	% of reference population
SW	7 m	0.38 / 0.2803	-	-	3,363 / 2,481	5.38 / 3.97
	11 m		-	-	3,380 / 2,493	5.41 / 3.99
N-OSP	7 m	0.38 / 0.2803	-	-	2,174 / 1,604	3.48 / 2.57
	14 m		-	-	2,190 / 1,615	3.50 / 2.58
S-OSP	7 m	0.38 / 0.2803	-	-	3,335 / 2,460	5.33 / 3.93
	14 m		-	-	3,355 / 2,475	5.37 / 3.96

Table 6.~~12~~13: PTS-onset ranges and numbers of harbour porpoise modelled to be within range for all potential charge weights

Charge Weight (kg)	Maximum range (km)	~~Site specific DAS~~ Density ~~estimate/ SCANS-IV density estimate~~ (animals/km²)	Number of ~~animals~~animals[1]	~~%~~Percentage of reference ~~population~~population[1] (%)
PTS-onset (unweighted SPL_{peak})				
		0.38~~/ 0.2803~~	2~~/ 1~~	<~~0.01 / <~~0.01
0.5 (low order)	1.2	0.2803	2	<0.01
		0.116527	1	<0.01
		0.38	~~25 / 19~~26	0.04~~/ 0.03~~
25 + donor	4.6	0.2803	19	0.03
		0.116527	8	0.01
		0.38	43~~/ 32~~	0.07~~/ 0.05~~
55 + donor	6.0	0.2803	32	0.05
		0.116527	14	0.02
		0.38	73~~/ 54~~	0.12~~/ 0.09~~
120 +donor	7.8	0.2803	54	0.09
		0.116527	23	0.04
240 + donor	9.8	0.38	115~~/ 85~~	0.18~~/ 0.14~~

Charge Weight (kg)	Maximum range (km)	~~Site specific DAS~~ Density ~~estimate/ SCANS-IV density estimate~~ (animals/km²)	Number of ~~animals~~animals[1]	~~%~~Percentage of reference ~~population~~population[1] (%)
		0.2803	85	0.14
		0.116527	36	0.06
525 + donor	12.0	0.38	172~~ / 127~~	~~0.27 / 0.20~~0.28
		0.2803	127	0.20
		0.116527	53	0.08
700 + donor	14.0	0.38	234~~ / 173~~	0.37~~ / 0.28~~
		0.2803	173	0.28
		0.116527	72	0.11
800 + donor	14.0	0.38	234~~ / 173~~	0.37~~ / 0.28~~
		0.2803	173	0.28
		0.116527	72	0.11
PTS-onset (weighted SELss)				
0.5 (low order)	0.11	0.38~~ / 0.2803~~	<1	<0.01
~~25 + donor~~	~~0.57~~	0.2803	<1	<0.01
		0.116527	<1	<0.01

Charge Weight (kg)	Maximum range (km)	~~Site specific DAS~~ Density ~~estimate/ SCANS-IV density estimate~~ (animals/km²)	Number of ~~animals~~animals[1]	~~%~~Percentage of reference ~~population~~population[1] (%)
		0.38	~~1 /~~ <1	<0.01
~~55~~25 + donor	~~0.74~~0.57	0.2803	<1	<0.01
		0.116527	<1	<0.01
		0.38	1	<0.01
~~120~~55 + donor	~~0.95~~0.74	0.2803	<1	<0.01
		0.116527	<1	<0.01
120 +donor	0.95	0.38	2	<0.01
~~240 + donor~~	~~1.1~~	0.2803	1	<0.01
		0.116527	1	<0.01
		0.38	2	<0.01
~~525~~240 + donor	~~1.4~~1.1	0.2803	2	<0.01
		0.116527	1	<0.01
		0.38	3	<0.01
525 + donor	1.4	0.2803	2	<0.01
		0.116527	1	<0.01

Charge Weight (kg)	Maximum range (km)	~~Site specific DAS~~ Density ~~estimate/ SCANS-IV density estimate~~ (animals/km²)	Number of ~~animals~~animals[1]	~~%~~Percentage of reference ~~population~~population[1] (%)
		0.38	3~~/ 2~~	<0.01
700 + donor	1.5	0.2803	2	<0.01
		0.116527	1	<0.01
800 + donor	1.6	0.38	~~3 / 2~~4	<0.01
~~Disturbance~~				
~~High Order Clearance~~	~~26~~	~~0.38/~~ 0.2803	~~807/ 595~~3	~~1.29~~<0.01
~~Low Order Clearance~~	~~5~~	~~0.38/ 0.2803~~0.116527	~~30/ 22~~1	~~0.05~~<0.01

[1]The number of animals disturbed and the reference population are representative of the Celtic and Irish Sea MU population (IAMMWG, 2023). The number of animals disturbed is not representative of the numbers disturbed within the Blackwater Bank SAC.

6.4.1.77 The nearest boundary of the Blackwater Bank SAC is located approximately 19.13 km from the Proposed Development. As such, even under the largest charge weight modelled, the predicted PTS-onset ranges for both high-order and low-order UXO clearance do not overlap with the SAC. Therefore, no harbour porpoise within the SAC are predicted to experience auditory injury as a result of UXO clearance activities associated with the Proposed Development.

6.4.1.78 Interpretation of the modelling results should take account of the frequency characteristics of high-order UXO detonation. The dominant energy produced by high-order detonation occurs at low frequencies, which is outside the region of greatest hearing sensitivity for harbour porpoise (Southall *et al.,* 2019), with a pronounced reduction in energy levels above approximately 5-10 kHz (von Benda-Beckmann *et al.,* 2015; Salomons *et al.,* 2021). On this basis, harbour porpoise are considered to have a relatively low sensitivity to auditory injury from UXO detonation compared to low- and mid-frequency cetaceans.

6.4.1.79 Furthermore, the Developer has committed to the implementation of project-specific mitigation measures for UXO clearance activities, as set out within the MMMP (NIS Volume III, Appendix 25.2: Marine Mammal Mitigation Plan). These measures are designed to minimise the risk of

auditory injury (PTS) to cetaceans arising from UXO-related noise, and will, as a minimum, adhere to relevant international best practice, including DAHG (2014) guidance (Table 6.7).

6.4.1.80 In relation to the site-specific COs for Blackwater Bank SAC (Table 5.1), the potential effects of underwater noise associated with UXO clearance on harbour porpoise have been assessed with respect to the attributes of access to suitable habitat and disturbance.

6.4.1.81 As UXO clearance and the associated underwater noise (which could potentially cause auditory injury) will be a short-term and temporary event (i.e. a one-off explosion), it would not permanently prevent harbour porpoises from accessing suitable habitat within, or functionally connected to, the Blackwater Bank SAC site. Any potential effects would be limited in duration and would not result in long-term exclusion from the SAC or the wider supporting habitat.

6.4.1.82 Regarding the disturbance attribute, even in the highly unlikely event that an individual experienced PTS-onset, available evidence indicates that it would be unlikely to significantly affect individual fitness (i.e. its ability to survive and reproduce; Kastelein *et al.*, 2017). Therefore, any UXO clearance activities are not expected to introduce man-made energy at levels capable of causing significant negative effects on individual harbour porpoises or the wider community associated within, or connected to, Blackwater Bank SAC, nor is it expected to cause injury or mortality at levels capable of affecting site integrity.

6.4.1.83 ~~6.4.1.22~~ **With consideration of ~~low level of impact PTS has on harbour porpoise, and that the~~the limited spatial extent of** predicted **~~range of effect falls outside of~~auditory injury (PTS-onset) ranges, the absence of overlap with** the SAC **(with the** greatest **predicted** impact range **~~predicted~~of up to ~~be~~** 14 km**) ~~and that at most 0.37%~~, the implementation of mitigation measures, and the negligible proportion** of the wider **~~population may be impacted~~MU potentially affected (<0.05%) even under the most precautionary scenario, it is concluded there will be no AEoI ~~upon the integrity of~~of the harbour porpoise QI of the** Blackwater Bank SAC, as defined by **~~the~~its COs ~~of the site~~, as a result of auditory injury ~~from~~due to** underwater noise **~~impacting harbour porpoise from~~associated with UXO clearance for** Project Design **~~Option~~Options 1 and 2.**

BEHAVIOURAL DISTURBANCE

6.4.1.84 The number of harbour porpoises predicted to experience behavioural disturbance as a result of high order UXO detonation, based on the application of a 20 km EDR, is presented in Table 6.14. Using the uniform SCANS-IV density estimate of 0.2803 animals/km^2, it is estimated that up to 325 animals (0.52% of the MU reference population) could be disturbed under this highly precautionary scenario.

6.4.1.85 For low order clearance, application of the 5 km EDR results in an estimated 23 harbour porpoises potentially disturbed (representing 0.04% of the MU reference population) when using the SCANS-IV density (Table 6.14).

Table 6.14: Predicted impact of disturbance to harbour porpoise from UXO for both high order (20 km) and low order clearance (5 km) EDRs. For further information on densities used, see Table 6.6.

UXO Scenario	EDR	Density (animals/km^2)	Number of animals disturbed[1]	Percentage of the reference population[1] (%)

High Order Clearance	20 km^2	0.38	441	0.71
		0.2803	325	0.52
		0.116527	135	0.22
Low Order Clearance	5 km	0.38	30	0.05
		0.2803	23	0.04
		0.116527	10	0.02

[1]The number of animals disturbed and the reference population are representative of the Celtic and Irish Sea MU population (IAMMWG, 2023). The number of animals disturbed is not representative of the numbers disturbed within the Blackwater Bank SAC.

[2]Reduced EDR to account for land overlap within the nominal 20 km radius (effective area 1,159.98 km^2 rather than 1,256.31 km^2)

~~6.4.1.23 **Based on the increased risk of effect of Project Design Option 1, it can be reasonably assumed that the same conclusion of no AEoI would also apply to Project Design Option 2.**~~

6.4.1.86 The nearest boundary of Blackwater Bank SAC is located approximately 19.13 km southwest from the Proposed Development Cable Corridor and Working Area. As such, the precautionary 20 km EDR for high-order UXO clearance only marginally overlaps with the outer edge of the SAC if clearance was to occur at this southernmost outer edge point. At the majority of other locations within the Array Area or Cable Corridor and Working Area, the SAC lies outside the EDR and would not be expected to experience any behavioural response. Notwithstanding this potential spatial overlap, behavioural responses to UXO clearance are expected to be limited to a brief startle reaction, with any displacement with any displacement occurring over a very short duration (e.g. minutes to hours) (JNCC, 2020). There is no empirical evidence indicating that single explosive events result in prolonged exclusion from habitat or sustained disruption to foraging behaviour in harbour porpoise.

6.4.1.87 Potential behavioural disturbance to marine mammals arising from UXO clearance activities has been considered within the project-specific MMMP (NIS Volume III, Appendix 25.2: Marine Mammal Mitigation Plan). While primarily designed to minimise the risk of auditory injury (PTS) to cetaceans from UXO clearance underwater noise, the MMMP will also act to reduce the magnitude and spatial extent of behavioural disturbance. The application of mitigation measures, informed by international best practice including DAHG (2014), will reduce the likelihood, spatial extent and duration of any behavioural responses, such that any disturbance would be temporary, localised and not of a nature that could affect population-level processes (Table 6.7).

6.4.1.88 Any behavioural disturbance associated with UXO clearance is therefore expected to affect a small proportion of the MU population (≤1%), be highly localised in time, recoverable, and infrequent during the construction phase. Given the single-pulse nature of the activity, it is concluded that harbour porpoise are not sensitive to UXO clearance behavioural disturbance effects when considering the integrity of the designated site.

6.4.1.89 In relation to the COs for Blackwater Bank SAC (Table 5.1), the potential effects of underwater noise associated with UXO clearance on harbour porpoise have been assessed with respect to the attributes of access to suitable habitat and maintain human activities below levels which would adversely affect the harbour porpoise community at the site (disturbance).

6.4.1.90 Whilst underwater noise generated from UXO clearance may result in a short-term startle response and temporary displacement of some individuals within or associated with the SAC, such disturbance would be brief in duration and would not constitute a permanent barrier to habitat use of the site.

6.4.1.91 Any individuals disturbed by UXO clearance are not predicted to experience significant negative effects on fitness, survival, or reproductive success for any life stage, nor is the activity expected to result in injury or mortality at a scale capable of affecting the harbour porpoise community associated with Blackwater Bank SAC.

6.4.1.92 **With consideration of the precautionary nature of the assessment, the low proportion of the population predicted to be affected, the implementation of mitigation measures, the extremely short-term and recoverable nature of behavioural disturbance, and the limited frequency of UXO clearance events, it is concluded there will be no AEoI of the harbour porpoise QI of the Blackwater Bank SAC, as defined by its COs, as a result of behavioural disturbance due to underwater noise during UXO clearance for Project Design Options 1 and 2.**

INJURY AND/OR DISTURBANCE FROM UNDERWATER NOISE DURING SITE SURVEYS

6.4.1.93 To support each phase of the Proposed Development, a number of confirmatory site surveys will be undertaken ahead of offshore infrastructure installation, and at intervals throughout the operational and maintenance phase (see Section 4.3.2 and Table 4.16 in NIS Volume I, Supporting Information for Screening for Appropriate Assessment Report).

6.4.1.94 As the precise scope and specification of survey activities has not yet been finalised, a precautionary approach has been adopted. This assessment therefore considers a representative range of geophysical and geotechnical survey equipment that may be reasonably employed, encompassing both impulsive and non-impulsive sound sources.

6.4.1.95 Geophysical survey techniques may include: multibeam echosounder (MBES), side scan sonar (SSS), sub-bottom profilers (SBP), ultra-short baseline (USBL) positioning systems, seismic refraction and sparker surveys that typically produce sonar-based or non-impulsive sound sources. Geotechnical surveys may include composite borehole drilling with associated down-hole testing (including seismic cone penetration testing (CPT)), vibrocore sampling and grab sampling, noting that some activities (e.g. grab sampling) are not expected to generate measurable underwater noise.

6.4.1.96 Indicative source levels for representative geophysical and geotechnical survey equipment are presented in Table 6.15 and Table 6.16. Predicted underwater noise propagation and associated impact ranges generated from site surveys were modelled by Seiche Ltd., with full details of methodology, assumptions, and outputs provided in the Subsea Noise Assessment (Seiche Ltd., 2022).

and equipment, with indicative source levels.

Table 6.15: Expected geophysical survey and equipment, with indicative source levels

Survey type	Equipment type	SEL (unweighted) (dB re 1µPa²s @1 m)	SPL_{rms} T90 (dB re 1µPa at 1 m)	SPL_{pk} (dB re 1µPa at 1 m)
Non-impulsive sonar-based surveys / equipment				
Multibeam echosounder (MBES)	Konsberg EM2040 or Reason Seabat 7125	N/A	213	N/A
Side scan sonar (SSS)	Edgetech FS4200 or Klein 5000	N/A	210	N/A
Sub-bottom profiler (SBP)	Innomar SES Standard / Medium or Applied Acoustics AA251 or Edgetech 6205S	N/A	245	N/A
Ultra-short baseline (USBL) positioning equipment	Sonardyne Compatt 6 8300-3111	202	184	202
Impulsive surveys / equipment				
Seismic refraction	TI sleeve 10CU	195	214	224
Sparker (2DUHRS and 3DUHRS)	Geosource 200 – 400	182	214	219

geotechnical surveys and source levels

~~6.4.1.24 With regards to behavioural changes caused by underwater noise, per our assessment in Table 6.11 total of up to 3,380 harbour porpoise (5.41% of the population) may experience disturbance during the Proposed Development's construction phase based on the highest population density estimates, which we consider to be highly precautionary. Other sources of disturbance (UXO clearance and surveys) are anticipated to result in less disturbance than the piling.~~

Table 6.16: Expected geotechnical survey techniques and source levels

Survey type	Source level (dB re 1µPa at 1 m (peak)	Source SEL (dB re 1 µPa²s at 1 m) (unweighted)	SPL_{rms} T90 (dB re 1µPa at 1 m)
Seismic Cone Penetration Test (CPT)[1]	220	189	203
Vibrocore	190	223[2]	187
Grab sample	N/A	N/A	N/A

[1]Equipment is pushed into the seabed and therefore would not result in a measurable noise source.

[2]Based on one hour of operation for a single core sample.

CONSTRUCTION PHASE ASSESSMENT

6.4.1.97 The Subsea Noise Assessment (Seiche Ltd., 2022) concluded that PTS-onset ranges from site surveys are limited to relatively small distances from the sound source and vary by survey type and marine mammal FHG, with harbour porpoise (VHF cetaceans) representing the most sensitive receptor.

6.4.1.98 While PTS is a permanent effect which cannot be recovered from, the most likely response of a marine mammal to noise levels that could induce TTS is to flee the area (Southall *et al.,* 2007). Therefore, animals exposed to these noise levels that could induce TTS are likely to actively avoid hearing damage by moving away from the source. Like the other underwater noise assessments, whilst the TTS impact ranges are presented here, the implications of TTS are considered alongside behavioural disturbance, reflecting its temporary and recoverable nature and its relevance to short-term changes in behaviour rather than long-term population level effects.

6.4.1.99 Predicted maximum PTS- and TTS-onset distances are summarised in Table 6.17. The largest predicted cumulative PTS-onset range for harbour porpoise is 517 m for SBP surveys. Other survey activities have smaller ranges, mostly tens of metres or less. The largest predicted cumulative TTS range for harbour porpoise is 3.15 km for SBP surveys, with all other survey activities associated with substantially smaller TTS-onset ranges (Table 6.17; Seiche Ltd., 2022).

Table 6.17: Predicted maximum impact ranges for harbour porpoise from proposed site surveys (Seiche Ltd., 2022)

Survey category	Equipment type	Noise type	Effect	PTS Maximum predicted range (m)	TTS Maximum predicted range (m)
Geophysical	MBES	Non-impulsive	Cumulative	25	33
Geophysical	SSS	Non-impulsive	Cumulative	25	97
Geophysical	SBP	Non-impulsive	Cumulative	517	3,150
Geophysical	USBL positioning equipment	Non-impulsive	Cumulative	1.7[1]	50[2]
Geophysical	Seismic refraction	Impulsive	Instantaneous	22	40
			Cumulative	130	1,524
Geophysical	Sparker (2DUHRS and 3DUHRS)	Impulsive	Instantaneous	N/A[3]	32
			Cumulative	14	68
Geotechnical	Seismic CPT	Impulsive	Instantaneous	15	33
			Cumulative	62	856
Geotechnical	Vibrocore	Non-impulsive	Cumulative	2	607

Survey category	Equipment type	Noise type	Effect	PTS Maximum predicted range (m)	TTS Maximum predicted range (m)

[1]USBL was not included in the Subsea Noise Assessment (Seiche Ltd., 2022) however, CSA Ocean Sciences Inc. (2020) estimated that the maximum distance to the weighted Level A threshold (cumulative PTS) is 1.7 m for VHF cetaceans (harbour porpoise).

[2]Based on maximum distance to all FHG Level B threshold (SPL_{rms}; CSA Ocen Sciences Inc., 2020).

[3]Instaneous PTS thresholds are not exceeded for any FHG for the sparker surveys.

6.4.1.100 The closest distance between the Proposed Development and Blackwater Bank SAC is approximately 19.13 km, substantially greater than all predicted PTS- and TTS-onset ranges for all survey activities (Table 6.17). As such, no risk of auditory injury to harbour porpoise within the SAC is predicted.

6.4.1.101 Furthermore, the Developer has committed to the implementation of project-specific mitigation measures for site surveys, as set out within the MMMP (NIS Volume III, Appendix 25.5 (Revised March 2026)). These measures are designed to minimise the risk of auditory injury (PTS; and in turn disturbance) to cetaceans arising from site survey noise. The mitigation strategy will, as a minimum, adhere to international best practice, including DAHG (2014) guidance (Table 6.7).

6.4.1.102 A study by Lucke *et al.* (2009) indicated that TTS could be induced in harbour porpoise at 350 m when exposed to an airgun impulse at a peak pressure of 200 dB_{pk-pk} re 1 µPa with corresponding SEL of 164.5 dB re $\mu Pa^2{}_s$) in shallow waters (~4 m), however this study is highly conservative as it assumes that the animal would remain stationary throughout the exposure. Evidence from other studies suggests that harbour porpoises exposed to such noise sources would likely move away from the source, and therefore leave the impact range of PTS-onset (Hermannsen *et al.,* 2015). Furthermore, it is expected that vessel presence will act as a deterrent to harbour porpoise, reducing the risk of auditory injury (Benhemma-Le Gall *et al*., 2023). Therefore, it is highly unlikely that harbour porpoise will be present in the immediate vicinity at the start of any survey activity.

6.4.1.103 Behavioural disturbance thresholds applied in the Subsea Noise Assessment (Seiche Ltd., 2022) are 140 dB re 1 µPa (rms) for mild disturbance and 160 dB re 1 µPa (rms) for strong disturbance from impulsive sound sources, and 120 dB re 1 µPa (rms) for disturbance from non-impulsive sound sources.

6.4.1.104 Predicted behavioural disturbance ranges vary by survey type and sound source. For non-impulsive geophysical survey sound sources (MBES, SSS, SBP), disturbance could occur at distances of up to approximately 4.95 km for SBP sources for all marine mammal FHG. USBL were not included in the Subsea Noise Assessment (Seiche Ltd., 2022) however, CSA Ocean Sciences Inc. (2020) estimated that the maximum distance to the Level B threshold (disturbance) is 50 m for all marine mammal FHG. For impulsive geophysical sound sources, disturbance could occur out to 700 m for a sparker and out to 1.32 km for seismic refraction were predicted (Seiche Ltd., 2022). For geotechnical surveys, the predicted disturbance could occur out to 10 km for vibrocore surveys and 1.5 km for seismic CPT surveys for strong disturbance (Seiche Ltd., 2022).

6.4.1.105 While some predicted disturbance ranges extend beyond the boundary of the Proposed Development, the closest distance to the Blackwater Bank SAC (19.13 km away) remains

substantially greater than predicted disturbance ranges, and any behavioural responses are expected to be short-term and reversible in nature.

6.4.1.106 In relation to the Blackwater Bank SAC site-specific COs (Table 5.1), site surveys will not result in permanent or long-term restriction of access to suitable habitat, nor introduce underwater noise at levels that would cause injury or sustained disturbance to the harbour porpoise community.

6.4.1.107 ~~6.4.1.25~~ **With consideration of the ~~low proportion of the population to be impacted and the recoverable and short-term (although repeated) nature of the impact~~very limited spatial extent of predicted auditory injury and behavioural disturbance ranges, the absence of overlap with the SAC (with the greatest predicted impact range up to 4.95 km), and the implementation of mitigation measures, it is concluded there will be no AEoI ~~upon the integrity of~~of the harbour porpoise QI of the Blackwater Bank SAC, as defined by ~~the~~its COs ~~of the site~~, as a result of auditory injury or behavioural disturbance ~~from~~due to underwater noise ~~impacting harbour porpoise from~~associated with site surveys during the construction phase for Project Design ~~Option~~Options 1 and 2.**

~~6.4.1.26 Based on the increased risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.~~

OPERATIONAL AND MAINTENANCE PHASE ASSESSMENT

6.4.1.108 Routine geophysical surveys of inter-array, inter-connector, and export cables will occur every six months during the first two years and annually thereafter throughout the operational and maintenance phase of the Proposed Development (Table 6.8).

6.4.1.109 As the exact equipment is not yet confirmed, an assessment has been undertaken for the site survey equipment and source levels as per Table 6.15 and Table 6.16. Therefore, the predicted impact ranges of auditory injury (PTS), TTS and behavioural disturbance from site surveys during the operational and maintenance phase are expected to be similar to the results of the Subsea Noise Assessment (Seiche Ltd., 2022; CSA Ocean Sciences Inc, 2020) conducted for confirmatory site surveys during the pre-construction phase. as part of the FLA.

6.4.1.110 **With consideration of the limited spatial extent of predicted auditory injury and behavioural disturbance, the absence of overlap with Blackwater Bank SAC, the implementation of mitigation measures, and the temporary nature of any effects, it is concluded that there will be no AEoI of the harbour porpoise QI of the Blackwater Bank SAC, as defined by its COs, from underwater noise arising from site surveys during the operational and maintenance phase for Project Design Option 1 and 2.**

INJURY AND/OR DISTURBANCE FROM UNDERWATER NOISE DURING DREDGING AND TRENCHING

6.4.1.111 As part of seabed preparation for construction, seabed lowering and feature clearance may be required through dredging activities (Table 6.8). Additional dredging may also be required during the operational and maintenance phase for scour protection repair and maintenance of WTG and OSP foundations, and for maintenance of inter-array cables, interconnector cables and offshore export cables. Trenching will also be required during the offshore export cable installation; with the majority of the cable route expected to be buried using jet trenching techniques.

6.4.1.112 Activities of relevance are those that generate underwater non-impulsive noise, including backhoe dredging, grab or clamshell dredging, mass flow excavation, water injection dredging, suction hopper dredging, jet trenching, mechanical trenching and vertical injector tools.

6.4.1.113 Underwater noise levels generated from non-impulsive construction activities, including dredging and trenching, were predicted by Subacoustech Environmental Ltd. The assessment draws on the source levels assumed for the relevant equipment, as presented in Table 6.18. Source levels for TSHD are taken from McQueen *et al.* (2019). Full details of the modelling methodology, assumptions and resulting impact ranges are detailed in the Underwater Noise Assessment (NIS Volume III, Appendix 11.1: Underwater Noise Assessment).

Table 6.18: Estimated source levels for dredging and trenching

Activity	SPL_{pk} (dB re 1µPa at 1 m)
Dredging (backhoe)	165
Dredging (suction)	186
TSHD	186
Trenching	172

~~6.4.1.27 There are no piling activities proposed for the operational and maintenance phase of the Proposed Development. Any underwater noise produced will be due to vessel movements which is assessed in Section 6.4.1.128 to 0.~~

~~6.4.1.28 **There is no potential for AEoI from underwater noise in the operational and maintenance phase of the Proposed Development on this site and feature, as defined by the COs of the site, for both Project Design Option 1 and 2.**~~

CONSTRUCTION PHASE ASSESSMENT

6.4.1.114 NIS Volume III, Appendix 11.1: Underwater Noise Assessment (Revised March 2026) concluded that for non-impulsive construction activities, including dredging and trenching, cumulative PTS could only occur at very short distances from the sound source. For trenching, backhoe dredging and suction dredging, predicted cumulative PTS-onset ranges for harbour porpoise (VHF cetacean FHG; Southall *et al.*, 2019) are less than 50 m. The same assessment concluded that cumulative TTS could occur at distances of up to 250 m from the source for suction dredging, with TTS-onset ranges for trenching up to 820 m and backhoe dredging remaining below 50 m for harbour porpoise.

6.4.1.115 Dredging and trenching activities produce continuous, non-impulsive underwater noise and are not expected to result in auditory injury (PTS) in marine mammals, based on observed thresholds for exposure to continuous noise. The dominant energy from these activities typically occurs below 1 kHz (Todd *et al.*, 2015), which lies outside the peak hearing sensitivity range of harbour porpoise (VHF cetaceans). As a result, the potential for PTS (or TTS) to occur from these construction activities is expected to have little relevance to individual fitness, survival or reproductive success, as the hearing sensitivity of these receptors is relatively poor below 1 kHz (Southall *et al.,* 2019).

6.4.1.116 The presence of vessels associated with non-piling related construction activities is expected to act as a deterrent to harbour porpoise prior to the commencement of dredging or trenching

activities (Brandt *et al.*, 2018), further reducing the likelihood that individuals would remain in close proximity to the sound source at the onset of dredging or trenching. In combination with the very limited spatial extent of predicted PTS-onset ranges and the relatively low sensitivity of harbour porpoise to low-frequency noise, dredging and trenching are therefore considered unlikely to result in auditory effects of relevance to individual fitness or population-level parameters.

6.4.1.117 Information on marine mammal sensitivity to dredging and trenching noise is limited, with available studies focusing primarily on the impact of behavioural disturbance from dredging. These studies have confirmed that dredging activities can result in short-term displacement and avoidance behaviour in marine mammals (e.g. Culloch *et al.*, 2016; Pirotta *et al.*, 2013). However, it is often difficult to distinguish the effects of underwater noise from disturbance associated with vessel presence required to undertake the activity (Todd *et al.*, 2015).

6.4.1.118 Dredging activities have been shown to result in temporary displacement of harbour porpoise within a radius of up to 5 km around the dredging location (Verboom, 2014). Diederichs *et al.* (2010) noted there was short term avoidance (around 3 hours) at distances of up to 600 m from a TSHD, with no evidence of long-term displacement. Modelling of dredging associated with port expansion predicted disturbance ranges of approximately 400 m, with more precautionary assumptions extending avoidance of harbour porpoise up to 5 km (McQueen *et al.* 2020).

6.4.1.119 There are currently no empirical data describing harbour porpoise responses specifically to trenching activities. In the absence of such data, it is assumed that behavioural responses and deterrence distances would be similar to those associated with dredging, and therefore limited to within 5 km. Should behavioural disturbance occur, it is expected to be short-term and reversible, with animals returning to the area following cessation of activities.

6.4.1.120 The closest distance between dredging and trenching activities and the boundary of the Blackwater Bank SAC is approximately 19.13 km. This distance substantially exceeds the maximum predicted ranges for PTS-onset, TTS-onset and behavioural disturbance (5 km) associated with dredging and trenching.

6.4.1.121 In relation to the Blackwater Bank SAC COs (Table 5.1), dredging and trenching during construction will not result in permanent or long-term restriction of access to suitable habitat within the SAC, nor introduce underwater noise at levels that would cause injury or sustained disturbance to the harbour porpoise community associated with the site.

6.4.1.122 **With consideration of the very limited spatial extent of predicted auditory injury and behavioural disturbance associated with dredging and trenching activities, the absence of overlap with the Blackwater Bank SAC (with the greatest predicted disturbance impact range of up to 5 km), and the temporary, localised and reversible nature of any behavioural disturbance, it is concluded that there will be no AEoI of the harbour porpoise QI of the Blackwater Bank SAC, as defined by its COs, as a result of underwater noise arising from dredging and trenching activities during the construction phase for Project Design Options 1 and 2.**

OPERATIONAL AND MAINTENANCE PHASE ASSESSMENT

6.4.1.123 During the operational and maintenance phase, dredging and trenching may be required intermittently for scour protection repair and maintenance of foundations and cables. These activities are expected to be localised, short-term and less frequent than those undertaken during the construction phase.

6.4.1.124 Based on the predicted underwater noise modelling presented in the Underwater Noise Assessment (NIS Volume III, Appendix 11.1: Underwater Noise Assessment (Revised March 2026)), the predicted ranges for PTS-onset, TTS-onset and behavioural disturbance during operation and maintenance are expected to be comparable to those assessed for the construction phase, assuming similar equipment and methods are anticipated to be used.

6.4.1.125 The closest distance between dredging and trenching activities during the operational and maintenance phase and the boundary of the Blackwater Bank SAC is approximately 19.13 km. This distance substantially exceeds the maximum predicted ranges for auditory injury (PTS), TTS, and behavioural disturbance associated with dredging and trenching activities.

6.4.1.126 In relation to the Blackwater Bank SAC COs (Table 5.1), dredging and trenching during the operational and maintenance phase will not result in permanent or long-term restriction of access to suitable habitat within the SAC, nor introduce underwater noise at levels that would cause injury or sustained disturbance to the harbour porpoise community.

6.4.1.127 **With consideration of the limited, infrequent and localised nature of dredging and trenching during the operational and maintenance phase, the very limited spatial extent of predicted auditory injury and disturbance ranges, and the absence of any overlap with the Blackwater Bank SAC, it is concluded that there will be no AEoI of the harbour porpoise QI of the Blackwater Bank SAC, as defined by its COs, as a result of underwater noise arising from dredging and trenching during the operational and maintenance phase for Project Design Options 1 and 2.**

INJURY AND / OR DISTURBANCE FROM VESSEL MOVEMENTS

6.4.1.128 ~~6.4.1.29 There will be~~ Increased vessel ~~movements~~movement compared to baseline levels during all phases of the Proposed Development~~, which can~~ has the potential to result in a range of impacts such as, injury and/ or mortality from vessel ~~collision~~activities, or disturbance though presence and the generation of associated underwater noise.

6.4.1.129 Project-related vessel numbers and movements used as inputs to this assessment are derived from Section 4.2.9 of the SISAA (NIS Volume I: Supporting Information for Screening for Appropriate Assessment (Revised March 2026)). This includes the anticipated vessel types, maximum concurrent vessel presence, and indicative return trip estimates, which form the basis for evaluating potential injury and disturbance risks to Annex II marine mammal QIs from vessel activities across the relevant phases of the Proposed Development.

6.4.1.130 ~~6.4.1.30~~ The area surrounding the Proposed Development experiences a relatively low level of vessel traffic due to the presence of the shallow Arklow Bank sandbank, with higher traffic in the coastal areas and immediate surrounding waters (see EIAR Volume II, Chapter 15: Shipping and Navigation (Revised March 2026)).

6.4.1.131 ~~6.4.1.31~~ The shipping and navigation baseline study (NIS Volume III, Appendix 15.1: Navigational Risk Assessment (Revised March 2026)) recorded ~~29 days of~~ vessel traffic ~~data~~over 29 days between 7 July and 14 August 2023. ~~There was an~~On average ~~of~~, 36 to 37 unique vessels per day were recorded within the shipping and navigation Study Area (which is defined as the Array Area and a 10 nm buffer)~~.~~, with a maximum of 59 vessels on the busiest day ~~recorded 59 unique vessels within the shipping and navigation Study Area. The main~~. Vessel types ~~within the shipping and navigation Study Area were~~were predominantly cargo ~~vessels~~ (40%), recreational ~~vessels~~ (31%) and fishing ~~vessels~~ (10%).

INJURY FROM VESSEL ACTIVITIES

6.4.1.132 ~~6.4.1.32~~ During construction of the ~~windfarm~~Proposed Development, a potential source of impact from increased vessel activity is physical trauma from collision with a boat or ship. In general, three consequences of injury from vessel ~~collision~~activities are defined:

- Direct ~~(~~effects: injuries or mortality to the ~~animals~~individual that are the immediate result of collision~~),~~;
- Long-term ~~(a~~effects: decrease in the fitness of the animal over time~~),~~; and ~~population consequences (Schoeman et al., 2020). With regards to~~
- Population-level consequences: depending on mortality rates (Schoeman *et al*., 2020).

6.4.1.133 Direct injuries from vessel strikes, both fatal and non-fatal ~~injuries~~, between marine mammals and vessels have been documented (Laist *et al*., 2001; Vanderlaan *et al*., 2008; Cates *et al*., 2017~~). Fatal collisions have been evidenced via carcasses washing up on beaches (Laist et al., 2001~~; Peltier *et al*., 2019~~); carcasses caught on vessel bows (Laist et al., 2001; Peltier et al., 2019); and floating carcasses which have strong~~. Evidence of ship strike~~, such as~~ includes propeller cuts, significant bruising, oedema, internal bleeding radiating from a specific impact site, fractures and ship paint marks (Jensen and Silber, 2003; Douglas *et al*., 2008). Fatalities from ship strikes~~, however, often go unreported~~ are likely underreported (Authier *et al.,* 2014)~~. For~~, while non-fatal injuries~~, evidence of~~ are widely observed in animals ~~which have survived ship strikes with non-fatal injuries from~~that survive collisions with propellers has been widely documented (Wells *et al.,* 2008; Luksenburg, 2014).

6.4.1.134 ~~6.4.1.33~~ Although many ~~species of~~ marine mammals ~~are able to~~can detect and avoid approaching vessels, it is unclear why some individuals do not always move out of the vessel's path ~~of an approaching vessel~~ (Schoeman *et al*., 2020)~~, although it has been suggested that~~. This may occur because animals are engaged in behaviours such as resting, foraging, nursing, ~~and~~or socialising ~~could distract animals from detecting the risk posed by vessels~~, which can reduce vigilance (Dukas, 2002)~~. It is also possible that~~ or because animals ~~do not hear vessels when they are~~ near the surface~~.~~ are unable to hear the vessel approaching. As a result, collisions ~~between cetaceans and vessels, however,~~do not occur, or are not necessarily lethal ~~on~~, in all occasions where vessels are present.

6.4.1.135 ~~6.4.1.34~~ Whilst a broad range of vessel types have been involved in collisions with marine mammals (Laist *et al*., 2001), larger vessels travelling at higher speeds ~~pose a higher risk because of the potential for a~~generate stronger strike ~~impact~~impacts and therefore pose a greater risk of serious injury or death to marine mammals (Schoeman *et al*., 2020). For example, a study by Laist *et al.* (2001) found that in 89% of collisions in which the whale was killed or seriously injured vessels were travelling at speeds ~~of 14 kn (~~above 7 m/s~~)~~ or more, and the vessel exceeded a length of 80 m. ~~Therefore,~~Conversely, smaller vessels with greater manoeuvrability, or larger vessels travelling at ~~7 m/s or faster are those most likely to cause~~lower speeds, present a much lower collision risk of death or serious injury to marine mammals (Laist *et al*., 2001).

6.4.1.136 ~~6.4.1.35~~ Harbour porpoises are relatively small ~~and~~, highly mobile, and given observed responses to noise, are expected to detect vessels in close proximity and largely avoid collision~~. Several studies have shown that harbour porpoise typically avoid vessels~~ (Benhemma-Le Gall *et al.,* 2021; ~~Benhemma-Le Gall et al., 2023~~; Brandt *et al*., 2018; Heinänen and Skov, 2015). However, there is a lack of information on the frequency of marine mammal vessel collisions ~~with marine mammals~~and stranding data in Irish waters~~, and there is a lack of evidence from marine mammals stranded in the Irish Sea~~ to suggest that injury from vessel ~~collisions~~activities is a significant

cause of marine mammal mortality~~.~~ in ~~the UK~~this region. For example, the Cetacean Strandings Investigation Programme (CSIP) ~~documents the annual number of reported strandings and the cause of death for those individuals examined at post-mortem. Based on the most recent CSIP report, post-mortems were conducted on 69 out of the 532 reported~~reported that of the 532 harbour porpoise strandings in the UK in 2018~~. A cause of death was established in 60 examined individuals and, of these,~~ only one individual was confirmed to have died from physical trauma due to vessel strike ~~and two individuals had died from physical trauma of an unknown cause, which could have been due to vessel strike (CSIP, 2019). It is not considered that vessel collisions to be a significant cause of mortality within the Irish Sea.~~out of 60 examined post mortems (CSIP, 2019).

~~6.4.1.36 Overall, the assessment concludes that there is a high likelihood that harbour porpoise will avoid vessels and therefore collision risk is viewed as negligible, although they have a high sensitivity to the impact should it occur.~~

~~6.4.1.37 With consideration to behavioural impacts from the presence of the noise generated by vessel movements, harbour porpoises are particularly sensitive to high frequency noise, and it is well documented that they typically avoid vessels (e.g. Culloch et al., 2016; Benhemma-Le Gall et al., 2021). During the construction of Beatrice and Moray East offshore windfarms in the Moray Firth, harbour porpoise occurrence decreased with increasing vessel presence, with the magnitude of decrease depending on the distance to the vessel (Benhemma-Le Gall et al., 2021). As such, the probability of harbour porpoise occurrence at a mean vessel distance of 2 km decreased by up to 95% to 0.02 for the highest vessel intensity (Benhemma-Le Gall et al., 2021). At a mean vessel distance of 3 km, the probability decreased by up to 57% to 0.16 for the highest vessel intensity, and no apparent response was observed at 4 km (Benhemma-Le Gall et al., 2021).~~

~~6.4.1.38 In a large-scale study of harbour porpoise density in UK waters, increased vessel activity was generally associated with lower harbour porpoise densities (Heinänen and Skov, 2015). Furthermore, Wisniewska et al., (2018) collected telemetry data to study the change in foraging rates of harbour porpoise in response to vessel noise in highly trafficked coastal waters in the inner Danish waters and Belt seas. The results show that occasional high-noise levels coincided with vigorous fluking, bottom diving, interrupted foraging and even cessation of echolocation, leading to significantly fewer prey capture attempts at received levels greater than 96 dB re 1 µPa (16 kHz third-octave band) (Wisniewska et al., 2018).~~

~~6.4.1.39 The studies discussed above evidence some changes in harbour porpoise behaviour and presence as a result of disturbance from vessel activity. Behavioural responses include increased fluking, interrupted foraging, change to vocalisations, prolonged dives and directed movement away from the sound source (Oakley et al., 2017; Wisniewska et al., 2018). Several studies have also evidenced an increase in vessel presence correlates with a decrease in harbour porpoise presence (Benhemma-Le Gall et al., 2021; Benhemma-Le Gall et al., 2023; Brandt et al., 2018). However, harbour porpoises occur widely throughout the Irish Sea (Berrow et al., 2010; Rogan et al., 2018a; Wall et al., 2013) and therefore it is assumed (since they have a requirement to feed regularly) that there is suitable foraging habitat across their range. Therefore, relatively short-term localised disturbance within the vicinity of the Proposed Development is unlikely to lead to any population-level effects on harbour porpoise. As a result, it is concluded that harbour porpoises are considered to be of reasonable adaptability, limited tolerance and have high recoverability. As such, they are generally not sensitive to impacts from vessel movements.~~ ~~**Therefore there is no potential for AEoI on the Blackwater Bank SAC, as defined by the COs of the site, as a result of injury or disturbance as a result of vessel movements.**~~

6.4.1.137 ~~6.4.1.40~~ During the construction phase, ~~a maximum of 66~~up to 69 installation vessels ~~will~~may be present within the Proposed Development at any one time, resulting in a maximum of 4,150 vessel return trips over the ~~five-year~~four-year construction period, and a maximum of 1,797 vessel return trips per year. A similar number of vessels are anticipated for the decommissioning phase.

6.4.1.138 ~~6.4.1.41~~ The majority of vessels used during the construction ~~phase~~and decommissioning phases are likely to be large vessels that will either be travelling considerably slower than 7 m/s ~~(the key risk is when this speed is exceeded with large vessels)~~ or will be stationary for significant periods of time. Therefore, the actual increase in vessel traffic moving within the Proposed Development and to/from port will ~~occur~~be intermittent over short periods of the offshore construction activity.

6.4.1.139 Smaller vessels involved in construction and decommissioning activities (i.e. tug/anchor handlers, guard vessels, survey vessels, and crew transfer vessels) are able to move to avoid marine mammals (when detected), even when an animal is close and the vessel is going at high speed, due to better manoeuvrability compared to larger vessels (Schoeman *et al.*, 2020). In contrast, large vessels, such as jack-up vessels, have low manoeuvrability and may require larger distances to avoid an animal, but travel at slower speeds.

6.4.1.140 In addition, the ~~factored-in~~mitigation measures (see Table 6.7) which includes an Environmental VMP (~~EVMP~~NIS Volume III, Appendix 25.10: Environmental Vessel Management Plan), will ensure that vessel traffic will move along predictable routes, which is known to be a key aspect in minimising the potential risks imposed by vessel traffic (Nowacek *et al.*, 2001; Lusseau, 2003; 2006). The ~~EVMP~~Environmental VMP also sets out a Code of Conduct to minimise interactions with marine mammals and to define how vessels should behave in the presence of them.

~~6.4.1.42 It is also anticipated that noise produced by the vessels will be detectable by harbour porpoise and therefore enable avoidance.~~

~~6.4.1.43 **It is concluded that there is no potential for AEoI upon the integrity of Blackwater Bank SAC, as defined by the COs of the site, as a result of injury from vessel collision impacting harbour porpoise from Project Design Option 1.**~~

~~6.4.1.44 **Based on the increased risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**~~

6.4.1.141 It is also likely that the noise emissions from vessels involved in the construction and decommissioning phases will be detectable by marine mammals and therefore will deter animals from the areas of potential impact. Whilst construction and decommissioning of the Proposed Development will lead to an uplift in vessel activity, vessel movements will be largely restricted to within the Array Area or along the Cable Corridor and Working Area and will follow existing shipping routes to/from ports. Due to the volume of pre-existing vessel traffic around the Irish Sea, the introduction of additional vessels during the construction and decommissioning phases of the Proposed Development is not considered to be a novel impact for marine mammals present within the vicinity of the Proposed Development. Therefore, it is not expected that vessel activities during the construction or decommissioning phase would increase the risk of injury due to vessel activities. It is also anticipated that noise produced by the vessels will be detectable by harbour porpoise and therefore enable avoidance.

6.4.1.142 With consideration of the mobility of harbour porpoises, the nature of construction and decommissioning vessel traffic, and the implementation of Environmental VMP measures, vessel movements are not expected to result in permanent exclusion from suitable habitat, injury, or

population-level effects. **It is therefore concluded that there will be no AEoI of the harbour porpoise QI of the Blackwater Bank SAC, as defined by its COs, as a result of injury from vessel activities associated with the construction and decommissioning phase for Project Design Options 1 and 2.**

OPERARTIONAL AND MAINTENANCE PHASE ASSESSMENT

6.4.1.143 During the operational and maintenance phase, a maximum of 30 vessels will be present within the Proposed Development at any one time, resulting in a maximum of 1,359 vessel return trips per year. Vessels that will be used during the operational and maintenance phase (up to 36.5 years) include crew transfer vessels, jack-up vessels, cable repair vessels.

6.4.1.144 As with construction activities, most vessels associated with the Proposed Development during the operational and maintenance phase are expected to travel at relatively low speeds within the Proposed Development, with larger vessels either stationary or operating at slow speeds during maintenance activities. Smaller, more manoeuvrable vessels (e.g. crew transfer vessels) will be able to alter course to avoid marine mammals when detected. For the reasons outlined in the section above, harbour porpoise are, therefore, expected to detect and avoid vessels, resulting in a low likelihood of collision.

6.4.1.145 The continued implementation of mitigation measures, including the Environmental VMP (NIS Volume III, Appendix 25.10: Environmental Vessel Management Plan; Table 6.7), will ensure predictable vessel routing and adherence to appropriate vessel management procedures, further reducing collision risk. Given the lower vessel numbers relative to construction, the absence of novel vessel activity, and the high baseline levels of vessel traffic in the Irish Sea, vessel movements during operational and maintenance are not expected to materially increase collision risk for harbour porpoise.

6.4.1.146 In relation to the site-specific COs for Blackwater Bank SAC (Table 5.1), vessel movements during the operational and maintenance phase will not result in permanent or long-term restriction of access to suitable habitat within the SAC, as vessel activity will be intermittent, transitory, and of lower intensity than during construction.

6.4.1.147 Given the relatively low vessel numbers, slow vessel speeds and continued application of Environmental VMP measures, vessel movements during operational and maintenance phase will not result in permanent habitat exclusion, injury, or population-level effects. **It is therefore concluded that there will be no AEoI of the harbour porpoise QI of the Blackwater Bank SAC, as defined by its COs, as a result of injury from vessel activities associated with the operational and maintenance phase for Project Design Options 1 and 2.**

VESSEL DISTURBANCE

6.4.1.148 With consideration to behavioural impacts from the presence of underwater noise generated by vessel movements, harbour porpoises are particularly sensitive to high frequency noise and typically avoid vessels (Culloch *et al.*, 2016; Benhemma-Le Gall *et al.*, 2021). Several studies have also evidenced reduced harbour porpoise occurrence with increasing vessel presence (Benhemma-Le Gall *et al.*, 2021; 2023; Brandt *et al.*, 2018; Heinänen and Skov, 2015). Evidence also shows some changes in harbour porpoise foraging behaviour as a result of high vessel traffic in coastal waters including increased fluking, altered vocalisations, prolonged dives (Wisniewska *et al.*, 2018) and directed movement away from the sound source (Oakley *et al.*, 2017).

6.4.1.149 Displacement and reduced foraging near vessels are considered generally to be short-term and reversible. Harbour porpoises occur widely across the Irish Sea (Berrow *et al.,* 2010; Rogan *et al.,* 2018; Wall *et al.,* 2013), suggesting suitable foraging habitat remains available across their range (since they have a requirement to feed regularly). Behavioural disturbance from occasional vessels is therefore unlikely to result in population-level effects.

CONSTRUCTION AND DECOMMISSIONING PHASE ASSESSMENT

6.4.1.150 During the construction phase, up to 69 installation vessels may be present within the Proposed Development at any one time, resulting in a maximum of 4,150 vessel return trips over the four-year construction period, and a maximum of 1,797 vessel return trips per year. A similar number of vessels are anticipated for the decommissioning phase.

6.4.1.151 ~~6.4.1.45~~ With consideration of disturbance and displacement, the coastal areas and immediate surrounding waters of the Proposed Development are already subject to high levels of vessel traffic. ~~With consideration of this~~Therefore, it is concluded that it is unlikely there will be a significant change in the level of disturbance that harbour porpoise naturally present are subject to. ~~In addition to this,~~

6.4.1.152 Heinänen and Skov (2015) suggested that harbour porpoise density was significantly lower in areas with vessel transit rates of greater than 20,000 vessels/year (80 per day within an area of 5 km^2). Comparatively, construction and decommissioning traffic will be intermittent, with vessel traffic in the Proposed Development ~~Study~~Array Area ~~averages~~plus a 10 nautical mile (nm) buffer averaging 36 vessels per day~~. The EVMP will serve to ensure that vessels follow predictable routes in addition to setting out how they should behave in the presence of the species~~. It is concluded that any disturbance above current baseline levels of activity will only result in a short-term and temporary effect on behaviour.

6.4.1.153 ~~6.4.1.46 The proposed~~The implementation of ~~a EVMP will reduce the risk of vessel disturbance by controlling the speed and movement of vessels~~Environmental VMP (NIS Volume III, Appendix 25.10: Environmental Vessel Management Plan; Table 6.7) measures will ensure that vessels follow predictable routes and controlled speeds, resulting in slower moving vessels travelling more predictable routes which are less likely to cause disturbance. ~~This is supported by~~ Vessel simulation modelling ~~by Findlay et al. (2023) which predicted that, when animals were exposed to vessels at a given distance with both a 20% and a 50% reduction in speed, all potential noise impacts were reduced. At a 20% reduction in speed, the vessel noise swath halved, reducing the average number of animals exposed by 50% and therefore~~shows that slowing vessels by 20-50% reduces source noise (by 5 dB for 20% and 18 dB for 50%) and reducing the number of animals exposed, therefore decreasing the likelihood of animals that are likely to be disturbed (Findlay *et al.*, 2023). ~~In addition, the study demonstrated that moderate slowdowns strongly reduce vessel source levels, with a 20% reduction in speed decreasing mean source levels by 6 dB and a 50% speed reduction by 18 dB (Findlay et al., 2023).~~

6.4.1.154 In relation to the site-specific COs for Blackwater Bank SAC (Table 5.1), vessel movements associated with the construction and decommissioning phase will not result in long-term displacement or interference with key behaviours that will lead to any population-level effects on harbour porpoise.

6.4.1.155 ~~6.4.1.47 **Therefore, it is**~~**With consideration of the temporary and reversible nature of behavioural responses, the localised extent of the disturbance expected, and the implementation of Environmental VMP measures to reduce risk, it is therefore concluded**

that there will be no AEoI ~~upon the integrity of~~of the harbour porpoise QI of the Blackwater Bank SAC, as defined by ~~the~~its COs ~~of the site~~, as a result of disturbance from vessel ~~movement impacting harbour porpoise from~~activities associated with the construction and decommissioning phase for Project Design ~~Option~~Options 1 and 2.

~~6.4.1.48 Based on the increased risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.~~

OPERATIONAL AND MAINTENANCE PHASE ASSESSMENT

6.4.1.156 ~~6.4.1.49~~ During the operational and maintenance phase, a maximum of ~~22~~30 vessels will be present within the ~~Array Area~~Proposed Development at any one time, resulting in a maximum of ~~1,294~~1,359 vessel return trips per year. ~~With consideration that this is a significant reduction in the number of vessels present in comparison to the construction and decommissioning phase, it is concluded that based on the assessment for that phase, there is no potential for a significant effect.~~

6.4.1.157 Vessel activity during the operational and maintenance phase represents a reduction in both vessel numbers and intensity compared to the construction and decommissioning phases. As during construction, vessel movements will be subject to the Environmental VMP (NIS Volume III, Appendix 25.10: Environmental Vessel Management Plan; Table 6.7), ensuring predictable routing, controlled speeds and adherence to mitigation measures designed to minimise disturbance to marine mammals.

6.4.1.158 With consideration of the relatively low vessel numbers, and similarly mitigated with the implementation of Environmental VMP measures, and evidence that behavioural responses to vessel presence are temporary and localised, any disturbance to harbour porpoise during the operational and maintenance phase is expected to be short-term and fully reversible, with animals returning to the area following any displacement from vessel passage.

6.4.1.159 ~~6.4.1.50 **Therefore, it is**~~ In relation to the site-specific COs for Blackwater Bank SAC (Table 5.1), vessel movements associated with the operational and maintenance phase will not result in long-term displacement, restriction of access to supporting habitat, or effects on the harbour porpoise community. **It is therefore concluded that there ~~are~~will be no AEoI ~~upon the integrity of~~of the harbour porpoise QI of the Blackwater Bank SAC, as defined by ~~the~~its COs ~~of the site~~, as a result of disturbance ~~or collision risk~~ from vessel ~~movement impacting harbour porpoise from Project Design Option 1 in this~~activities associated with the operational and maintenance phase~~.~~**

~~6.4.1.51~~ **for ~~Based on the increased risk of effect of~~ Project Design ~~Option~~Options 1~~, it is concluded that no AEoI would also apply to Project Design Option~~ and 2.**

CHANGES IN EMF FROM SUBSEA CABLING

6.4.1.160 ~~6.4.1.52 The conduction of electricity through~~The operation of subsea power cables ~~has the potential for emit~~generates localised EMF, which ~~has the potential to affect the sensory mechanisms of harbour porpoise~~are strongest immediately adjacent to the inter-array, export, and OSP interconnector cables and attenuate rapidly with distance from the buried cable (CMACS, 2003; ~~Copping, 2018;~~ Normandeau *et al.,* 2011)~~, though the effects are not well understood. This impact may only occur~~. Any EMF generation occurs during the operational and

maintenance phase of the Proposed Development when ~~there is~~ power ~~generation occurring~~is being transmitted (Table 6.8).

OPERATIONAL AND MAINTENANCE PHASE ASSESSMENT

~~6.4.1.53 Anthropogenic sources of EMF are primarily subsea cables used for power generation and telecommunications or submarine communications (Normandeau et al., 2011). Therefore, the presence and operation of between 110 and 122 km of 66 kV inter-array cables, between 35 and 40 km of 220 kV offshore export cables, and between 25 and 28 km of 220 kV OSP interconnector cables during the lifetime of the Proposed Development may lead to localised EMF effects on marine mammals.~~

~~6.4.1.54 Submarine cables can cause three different types of EMFs: electrical l fields, magnetic (B) fields, and induced electric (iE) fields. E-fields are measured in volts per metre (V/m) and are generated by the voltage of the cable. B-fields are measured in microtesla (µT) or milligauss (mG) where 1 µT = 10 mG and are generated by the current of the power through the cable. They attenuate both horizontally and vertically away from the cable, with field strength directly related to the power of the current passing through the cable, rather than being specifically related to the voltage. iE-fields are measured in V/m and are generated by the fluctuation of the B-fields (in AC transmission) or by the motion of the seawater (or an organism) through the B-field. Therefore, they are dependent on the strength of the B-field, thus the strength of the iE-field is directly related to the B-field, which is strongest closest to the cable, attenuating horizontally and vertically away from it.~~

~~6.4.1.55 EMFs also occur naturally in the marine environment from a variety of sources including background levels from the Earth's magnetic field, and very small fields generated by electrical currents moving through organisms (Tricas and Gill, 2011). The Earth's static B-field is present in both terrestrial and aquatic environments and lies in the range 25 to 65 µT (Hutchison et al., 2018). The B-field strength of the Irish Sea is approximately 49 µT (National Oceanic and Atmospheric Administration (NOAA), 2020).~~

~~6.4.1.56 Measurements of EMF for subsea cables associated with offshore windfarms vary, with the strength of the B-field generated generally related to the wind speed captured by the turbines. A variety of design and installation factors affect EMF levels in the vicinity of the cables such as current flow, distance between cables, cable insulation, number of conductors, configuration of cable and burial depth. For example, EMFs produced by inter-array cables are smaller than those of export and OSP interconnector cables as they are lower powered in comparison. Furthermore, the B-fields generated by High Voltage Alternating Current (HVAC) and High Voltage Direct Current (HVDC) cables are significantly different, with HVDC cables typically generating much larger EMFs than HVAC cables (Tricas and Gill, 2011). The transmission system used for the Proposed Development will only comprise HVAC.~~

~~6.4.1.57 CMACS (2003) reported that for a 132 kV three-phase AC cable with perfect shielding, the predicted B-field in close proximity to the cable was 1.6 µT and the respective iE-field was 91.25 µV/m above the cable if buried to 1 m depth, which reduced to 10 µV m-1 8 m from the cable. Gill et al. (2009) measured iE-fields of 30 µV/m and 110 µV/m at two different offshore windfarm cables (both three-phase AC, 36 kV, 100 A) close to the cables and B-fields of 0.23 µT and 6.5 µT, respectively. Continental Shelf Associates (CSA, 2019) compared offshore windfarm subsea cables and found EMF levels directly over live AC undersea power cables associated with offshore wind energy projects ranged between 5 to 15 mG (0.5 to 1.5 µT) for inter-array cables~~

and 10 to 40 mG (1 to 4 µT) for export cables, at heights of 1 m above the seabed. At lateral distances of between 3 m and 7.5 m from the cable, B-fields greatly reduced to <0.1 to 7 mG (<0.01 to 0.7 µT) for inter-array cables, and <0.1 to 12 mG (<0.01 to 1.2 µT) for export cables, at heights of 1 m above the seabed. Measurements of the iE-fields directly over live AC undersea power cables in the same study ranged between 0.1 to 1.2 mV/m for the inter-array cables and 0.2 to 2.0 mV/m for export cables, at heights of 1 m above the seabed (CSA, 2019). At lateral distances of between 3 m and 7.5 m, iE-fields reduced to between 0.01 to 0.9 m V/m for inter-array cables and 0.02 to 1.1 mV/m for export cables at heights of 1 m above the seabed.

6.4.1.58 The strength of the B-field (and consequently, iE-fields) decreases rapidly horizontally and vertically with distance from source (Normandeau et al., 2011). Burial of cables, in particular, can therefore reduce the strength of the B- and iE-fields. However, it is unlikely that cables can be buried to sufficient depths that will reduce the magnitude of the B-field, and hence the sediment-seawater interface iE-field, to the extent that these fields could not be detected by certain marine organisms on or close to the seabed (Gill et al., 2005). A study conducted by CSA (2019) found that inter-array and export cables buried between depths of 1 m to 2 m reduces the magnetic field at the seabed surface four-fold. For cables that are unburied and instead protected by thick concrete mattresses or rock berms, the field levels were found to be similar to buried cables.

6.4.1.59 Overall, based on the above assessment it is concluded that any potential impact will be highly localised, with strength dissipating rapidly with distance from the buried cables.

6.4.1.161 6.4.1.60 There is evidence to suggest that some species of cetacean may be able to detect variations in magnetic fields, therefore it is plausible that they are magneto-sensitive (Normandeau *et al.*, 2011). Kirschvink *et al.* (1986) suggested that species that were sensitive to changes in the Earth's magnetic field and that are likely to be present within the Proposed Development include harbour porpoise. However, the majority of these have had a theoretical evidence base, coming to differing conclusions regarding species' sensitivity to changes in electric and magnetic fields (Normandeau *et al.*, 2011). The only evidence of electro-sensitivity in marine mammals to date is reported in Guiana dolphin (*Sotalia guianensis*) as they have been shown to possess an electroreceptive system which is used to detect electrical stimuli (Czech-Damal *et al.*, 2013).

6.4.1.162 6.4.1.61 Potential responses of cetaceans from EMF could include avoidance behaviour, disruption in orientation, and effects on feeding or social interaction (Normandeau *et al.*, 2011), although it is important to note that these responses are all currently hypothetical. Whilst subsea cables could create a very localised change in the geomagnetic field (Taormina *et al.*, 2018), modelling studies of EMF from cables suggests that the likelihood of such a change affecting a large enough area to elicit a significant ~~course~~behavioural alteration would be low (Normandeau *et al.*, 2011).

6.4.1.163 Given there is no overlap of the Array Area and Cable Corridor and Working Area with the Blackwater Bank SAC, any EMF generated from subsea cables is far beyond the range that could affect harbour porpoise at the designated site, and unlikely to result in meaningful population-level impacts on the community at this site.

6.4.1.164 **Considering the highly localised, theoretical nature of the impact, and the recoverable behaviour of marine mammals, it is therefore concluded that there will be no AEoI of the harbour porpoise QI of the Blackwater Bank SAC, as defined by its COs, as a result of EMF from subsea cables for Project Design Options 1 and 2.**

6.4.1.62 With consideration that the evidence of impact is only theoretical, and the highly localised nature of potential impacts, and the effects are recoverable, it is concluded that any EMF effects, if there are any at all, are entirely negligible of impacting this QI.

6.4.1.63 **Therefore, it is concluded that there would be no AEoI upon the integrity of Blackwater Bank SAC, as defined by the COs of the site, from EMF impacting harbour porpoise from Project Design Option 1 in this phase.**

6.4.1.64 **Based on the increased risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

CHANGES IN FISH AND SHELLFISH COMMUNITY AFFECTING PREY RESOURCES

6.4.1.165 Potential impacts to prey resources arising from the Proposed Development are expected to be largely restricted to the boundaries of the Proposed Development due to the localised footprint of seabed disturbance, the temporary nature of construction activities, and the limited spatial extent of predicted underwater noise and sediment dispersion effects. As such, any indirect effects on harbour porpoise via changes in prey availability would be limited to individuals foraging within, or close proximity to the Proposed Development.

6.4.1.166 6.4.1.65 Harbour porpoise are generalist feeders, with a diet primarily dependent oncomprising whiting, (*Merlangius merlangus*), Atlantic herring (*Clupea harengus*) and poor cod for food ((*Trisopterus minutus*; Hernandez-Milian *et al.*, 2011). This demonstrates a varied diet and ability to adapt to changes in availability of prey types where needed and so we view harbour porpoise as generalist feeders.dietary flexibility allows harbour porpoise to adapt to localised or temporary changes in prey availability, reducing the likelihood that small-scale changes in prey abundance would affect the species at a site level. Annex II migratory fish QIs that may also contribute to Annex II marine mammal QI prey resources are assessed separately in Section 6.6, which provides an overview of relevant receptor groups, their ecological characteristics, and applicable noise sensitivity thresholds.

CONSTRUCTION AND DECOMMISSIONING PHASE ASSESSMENT

6.4.1.167 As detailed within the EIAR Volume II, Chapter 10: Fish, Shellfish and Sea Turtle Ecology (Revised March 2026), potential impacts on marine mammal prey species during the construction and decommissioning phase of the Proposed Development include (Table 6.8):

- 6.4.1.66 Potential impacts on prey species comprise of Temporary habitat loss / disturbance,;
- Increased SSC and associated deposition,;
- Injury and/ or disturbance as a result of underwater noise and vibration during pile driving and cable installation activities,; and
- Accidental pollution.

6.4.1.168 Potential impacts on prey species during the decommissioning phase are expected to be similar to, or less than, those during the construction phase.

6.4.1.169 6.4.1.67 With regardsregard to temporary habitat loss/disturbance and increased SSC and associated deposition, only a proportionsubset of harbour porpoises prey species are(particularly sedentary species or those reliant on spawning grounds) may be vulnerable to these effects. The only consideration for the wider more mobile species is if their spawning grounds are affected. The baseline assessment concludes that the mainWhere vulnerable species may be affected,

any impacts are expected to be highly localised, affecting only a small proportion of their wider nursery grounds (<0.01% of the habitats present within the Western Irish Fish, Shellfish and Sea Turtle Ecology Study Area covering an area of 13,748 km^2 from Co. Wexford to Co. Down), and therefore considered to be fully recoverable following cessation of construction and decommissioning activities. Baseline assessments indicate that the key spawning areas for ~~the majority of~~ fish and shellfish within the vicinity of the Proposed Development do not overlap with the ZoI ~~for harbour porpoises and therefore, it is concluded that any effects, if there are any at all, are entirely negligible for potential to impact a harbour porpoises ability to forage. Furthermore, of the species that are vulnerable to these impacts, these impacts only have potential to impact on a highly localised basis, and it is calculated that it will impact <1% of the habitats present. This consideration, and the highly recoverable nature of the species and temporary nature of the works, it is concluded this impact has no potential of AEoI through changes in prey.~~relevant to harbour porpoise. As a result, the effects on mobile prey species (which comprise the majority of the harbour porpoise diet) are considered negligible, and no meaningful impact on harbour porpoise foraging ability is anticipated.

6.4.1.170 Harbour porpoise are wide-ranging, mobile predators capable of adjusting their foraging effort over tens to hundreds of kilometres. Their generalist diet and flexible foraging ecology mean that small-scale, short-term reductions in local prey abundance are well within their natural capacity to accommodate. Accordingly, such impacts are not considered capable of influencing the site-specific COs relating to prey availability or habitat quality for the harbour porpoise QI.

6.4.1.171 ~~6.4.1.68~~ With regards to underwater noise and vibration, this impact can have a range of effects ~~comprising~~on prey ranging from behavioural changes~~, TTS,~~ to recoverable injury ~~and~~or mortality, with the extent of impact dependent on the prey species group. Underwater noise modelling from the Underwater Noise Assessment (NIS Volume III, Appendix 11.1: Underwater Noise Assessment (Revised March 2026)) shows the following distances (i.e. using unweighted SPL_{peak} criteria (Popper *et al.,* 2014); see Table 6.2438 and Table 6.2539 for full details):

~~6.4.1.69 Table 6.13 clarifies the various risk and impact thresholds based on scientific evidence.~~

Table 6.13: Mortality, potential injury, TTS, behaviour criteria for various fish groupings in relation to underwater noise (Popper *et al.* 2014)

			Impairment	
Fish grouping	**Mortality and potential mortal injury**	**Recoverable injury**	**Temporary Threshold Shift**	**Behaviour**
Pile driving noise				
No swim bladder (particle motion detection)	>219 dB SEL_{cum} or >213 dB SPL_{peak}	>216 dB SEL_{cum} or >213 dB SPL_{peak}	>186 dB SEL_{cum}	(N) High (I) Moderate (F) Low
Swim bladder is not involved in hearing (particle motion detection)	>210 dB SEL_{cum} or >207 dB SPL_{peak}	>203 dB SEL_{cum} or >207 dB SPL_{peak}	>186 dB SEL_{cum}	(N) High (I) Moderate (F) Low
Swim bladder is involved in hearing (primarily pressure detection)	>207 dB SEL_{cum} or >207 dB SPL_{peak}	>203 dB SEL_{cum} or >207 dB SPL_{peak}	>186 dB SEL_{cum}	(N) High (I) High (F) Moderate
Vessel noise or other continuous sources of noise				
No swim bladder (particle motion detection)	(N) Low (I) Low (F) Low	(N) Low (I) Low (F) Low	(N) Moderate (I) Low (F) Low	(N) Moderate (I) Moderate (F) Low
Swim bladder is not involved in hearing (particle motion detection)	(N) Low (I) Low (F) Low	(N) Low (I) Low (F) Low	(N) Moderate (I) Low (F) Low	(N) Moderate (I) Moderate (F) Low

		Impairment		
Fish grouping	**Mortality and potential mortal injury**	**Recoverable injury**	**Temporary Threshold Shift**	**Behaviour**
Swim bladder is involved in hearing (primarily pressure detection)	(N) Low (I) Low (F) Low	170 dB SPL_{rms} for 48 hrs	158 dB SPL_{rms} for 12 hours	(N) High (I) Moderate (F) Low

Notes: peak and rms sound pressure levels dB re 1 µPa; SEL dB re 1 µPa2·s. All criteria are presented as sound pressure even for fish without swim bladders since no data for particle motion exist. Relative risk (high, moderate, low) is given for animals at three distances from the source defined in relative terms as near (N; tens of metres from source), intermediate (I; hundreds of metres from source), and far (F; thousands of metres from source).

~~6.4.1.70 With regards to TTS and behaviour, it is concluded that this level of impact on prey would not result in a significant change in prey with consideration of the temporary and recoverable nature of the effect.~~

- ~~6.4.1.71 With consideration of~~Fish species ~~with no swim bladder the modelling indicates this~~ without swim bladders (threshold ~~may be exceeded up to 130~~213 dB): 120 m away from the sound source at the SW site, covering an area of up to ~~0.05~~0.04 km^2~~. At the other WTG foundation sites modelled, the maximum distance range was 90-120 m (0.03-0.04 km^2). For the two OSP foundation sites modelled, the maximum distance range was 110-120 m (0.03-0.04 km^2). This is the distance at which underwater noise and vibration may cause mortality or a recoverable injury to fish with no swim bladder. This is further reduced for fleeing species.~~; and
- ~~6.4.1.72 With consideration of~~Fish species with swim bladders both involved and not involved in hearing~~, modelling indicates this~~ (threshold ~~may be exceeded up to 340~~207 dB): 280 m away from the sound source at the SW site, covering an area of ~~up to 0.33 km^2. At the other WTG foundation sites modelled, the maximum distance range varied between 230-310 m (0.16-0.3 km^2) based on location on piling type. For the two OSP foundation sites modelled, the maximum distance range was 207-310 m (0.22-0.29 km^2). This is the distance at which underwater noise and vibration may cause mortality or a recoverable injury to fish that have a swim bladder that is not involved in hearing.~~0.22 km^2.

~~6.4.1.73 With consideration of species with swim bladders that are involved in hearing, modelling indicates this threshold may be exceeded up to 330 m away from the sound source at the SW site, covering an area of up to 0.33 km^2. At the other WTG foundation sites modelled, the maximum distance range was 230 – 310 m (0.16 – 0.3 km^2). For the two OSP foundation sites modelled, the maximum distance range was 207 – 310 m (0.22 – 0.29 km^2). This is the distance at which underwater noise and vibration may cause mortality or a recoverable injury to fish that have a swim bladder that is involved in hearing.~~

6.4.1.172 These distances represent the maximum extent of potential recoverable injury or mortality to prey species and are highly localised relative to the wider foraging area available to harbour porpoise. As such, these effects are not expected to result in a meaningful reduction in prey availability or accessibility for harbour porpoise.

6.4.1.173 ~~6.4.1.74~~ With ~~regards~~regard to accidental pollution, ~~this~~the risk is considered ~~as a~~ negligible ~~risk based on~~due to avoidance through design ~~of the Proposed Development. The EVMP, EMP and MPCP will be implemented reducing the risk~~ and implementation of mitigation measures, including the Environmental VMP (NIS Volume III, Appendix 25.10: Environmental Vessel Management Plan), EMP and MPCP (Table 6.7). These measures reduce the likelihood of accidental pollution such that any effects, if ~~there are any at all, are~~they were to occur, would be entirely negligible.

6.4.1.174 ~~6.4.1.75 It is concluded,~~ **With consideration of the highly localised and temporary nature of the impacts ~~above, low sensitivity, and generalist diets of the qualifying interest, there is no potential for AEoI upon the integrity of~~described above, the implementation of mitigation measures and resulting limited spatial extent of potential effects on prey species, and the generalist foraging strategy of harbour porpoise, it is concluded there will be no AEoI of the harbour porpoise QI of the Blackwater Bank SAC, as defined ~~by the~~its COs ~~of the site~~, as a result of changes in prey ~~impacting harbour porpoise from~~resources during the construction and decommissioning phase for Project Design Option 1 ~~in this phase~~.**

6.4.1.175 **Based on the representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

OPERATIONAL AND MAINTENANCE PHASE ASSESSMENT

6.4.1.176 During the operational and maintenance phase, the majority of potential effects on fish and shellfish communities that may influence harbour porpoise prey resources (including temporary habitat disturbance, increased SSC and associated deposition, and accidental pollution) have already been assessed for the construction phase (see Sections 6.4.1.169 to 6.4.1.173). These effects are temporary, localised and reversible, and are not predicted to result in any meaningful change in prey availability or accessibility for harbour porpoise.

6.4.1.177 Therefore, the operational and maintenance phase assessment focuses on those pathways that differ from those listed in the construction phase, namely (Table 6.8):

- Long-term habitat loss as a result of the presence of foundation structures, scour protection, and cable protection;
- Alteration of seabed habitats arising from changes in physical processes as a result of the presence of foundation structures, scour protection, and cable protection; and
- Changes in EMF from subsea cabling.

6.4.1.178 In regards to long-term habitat change, the presence of wind turbine foundations, OSP structures, scour protection and cable protection will result in small-scale and permanent alteration of seabed habitats within the footprint of the structures. These changes will be highly localised and will affect only a very small proportion of the available benthic habitat within the wider foraging range of harbour porpoise.

6.4.1.179 Habitat alteration associated with these structures may result in localised changes in fish and shellfish assemblages, however, any loss of soft sediment habitat will be minimal in extent and is not predicted to result in a net reduction in prey availability at a scale relevant to harbour porpoise.

6.4.1.180 Subsea power cables associated with the Proposed Development will emit localised EMF during operation. The range over which fish and shellfish species can detect electric or magnetic fields from offshore windfarm subsea cables is very limited and is likely to be restricted to distances of metres from the cable (CSA, 2019).

6.4.1.181 EMF exposure may result in minor behavioural responses in some prey species, such as short-term avoidance or changes in swimming behaviour; however, there is little evidence to suggest that EMF results in injury, mortality, or reduced survival of fish or shellfish (CSA, 2019). Pelagic prey species are considered unlikely to be exposed to EMF due to their position in the water column, while demersal species would only be affected in close proximity to the cable route. Any EMF-related effects on prey species are therefore expected to be highly localised and confined to the immediate vicinity of subsea cables, with no measurable effect on prey availability or distribution at a scale relevant to harbour porpoise foraging.

6.4.1.182 With consideration that operational-phase effects on prey resources are limited to highly localised habitat change and very small-scale, theoretical EMF-related behavioural responses, and that the majority of prey-related impact pathways have already been assessed as not giving rise to AEoI during construction, it is concluded that there will be no reduction in prey availability, prey accessibility or prey distribution relevant to harbour porpoise. **Therefore, there will be no AEoI on the harbour porpoise QI of the Blackwater Bank SAC, as defined by its COs, as a result of changes in prey resources associated with the operational and maintenance phase for Project Design Option 1.**

6.4.1.183 ~~6.4.1.76~~ **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

ACCIDENTAL POLLUTION

6.4.1.184 ~~6.4.1.77~~ There is ~~the~~ potential for ~~an~~ accidental release of pollutants ~~to occur~~ from vessels and equipment associated with the construction, operational and maintenance, and

decommissioning phases of the Proposed Development~~, which may result in adverse effects on marine mammals~~. Pollutants may include diesel fuel, bentonite (from drilling activities), lubricants, grease and oils, anti-fouling biocides, and grout.

6.4.1.185 ~~6.4.1.78~~ In the event of an accidental spill, ~~given the density and distribution of marine mammals in the Marine Mammal Study Area, it is possible that individuals could come into contact with~~harbour porpoise could be exposed to contaminants~~.~~ through either direct or indirect pathways:

- ~~6.4.1.79~~ Direct impacts include ingestion, inhalation, and absorption. All of which may result in physiological responses with health and long-term survival and/or reproduction consequences, the most serious of which could be damage to the respiratory system (Helm *et al.*, 2015)~~.~~; and
- ~~6.4.1.80~~ Indirect impacts include short- and long-term reductions in food availability, disruption to social bonds, reduced reproduction, and/or cumulative effects on individuals, populations, and the ecosystem (Helm *et al.*, 2015).

6.4.1.186 ~~6.4.1.81~~ However, harbour porpoise are ~~at risk from oil pollution in the marine environment because they lack the ability to leave the water to avoid oil. They are however~~ highly mobile and wide ranging, therefore any contact with a spill would be expected to be brief. Cetaceans are also capable of detecting and avoiding surface oil slicks, ~~for example, experiments with captive bottlenose dolphins have shown that they can visually discriminate between oil and uncontaminated water and avoid oil on the surface of the water~~as demonstrated in experimental studies (Geraci and St. Aubin, 1984).

~~6.4.1.82~~ While ~~However,~~ harbour porpoise must surface periodically to breathe, potentially bringing them into contact with ~~floating oil and volatile toxic components. The more extensive the slick, the more likely that an animal will surface within it~~surface pollutants, the likelihood of sustained exposure is dependent on spill magnitude, extent and duration (Geraci and St. Aubin, 1980~~). While oil does not readily penetrate cetacean skin, exposure could affect mucus membranes, eyes, and other external soft tissue areas, potentially resulting in mortality (~~; Helm *et al.*, 2015).

~~6.4.1.83 Overall, accidental pollution has the potential to cause LSE on harbour porpoise features.~~

CONSTRUCTION AND DECOMMISSIONING PHASE ASSESSMENT

6.4.1.187 ~~6.4.1.84~~ The installation and removal of ~~the~~ offshore infrastructure for the Proposed Development may lead to the accidental release of pollutants through spills and leaks from vessels and equipment~~. The project design parameters for Project Design Option 1 during the construction phase are outlined in~~ Table 6.8 ~~and include the installation of 56 WTGs, two OSPs, between 110 and 122 km of inter-array cables, between 25 and 28 km of interconnector cables, and between 35 and 40 km offshore export cables. There will also be up to 4,150 vessel round trips and 294 helicopter round trips during the construction phase (including activities at the landfall site~~ (Table 6.8).

~~6.4.1.85 The~~ Potential ~~impact to marine mammals from accidental pollution~~impacts during the decommissioning phase ~~is~~are expected to be ~~the same~~similar to, or less than, those during the construction phase.

6.4.1.188 ~~6.4.1.86~~ The magnitude of ~~the impact of~~any accidental pollution ~~will be dependent on the quantities of potential pollutants carried by construction vessels and within equipment.~~event would depend on the type and quantity of material released, with the release of ~~a large inventory of~~ fuel ~~oil~~ from a construction vessel ~~is, however,~~ considered to represent the ~~greatest~~largest potential ~~accidental pollution event from~~spill scenario during installation activities. In the event of an accidental spill from vessels, equipment or from construction and decommissioning activities, ~~the spill~~pollutants would be subject to immediate dilution and rapid ~~dispersal~~dispersion within the marine environment (Marappan *et al.,* 2022).

6.4.1.87 Considering avoidance through design and management (see Table 6.7), the likelihood of accidental release is considered extremely low. The measures in the EMP include storage of chemicals in secure designated areas on vessels in line with appropriate regulations and guidelines, and double skinning of any tanks and pipes containing hazardous substances. All chemicals used will be subject to a chemical risk assessment to ensure risks are understood and minimised. The EMP also includes a MPCP which will contain key emergency contact details and response procedures in the event of a spill of any magnitude to ensure minimal impact. Complying with these procedures will also reduce the magnitude of any spill. Adherence to the avoidance design and management measures outlined in Table 6.7, including the EMP and MPCP will significantly reduce the likelihood of an accidental pollution incident occurring, and the magnitude of its impact.

6.4.1.189 The likelihood of accidental pollution is considered extremely low due to avoidance through design and management measures (Table 6.7). These include the secure storage and handling of chemicals and hazardous material, double-skinned tanks and pipework where appropriate, chemical risk assessments, and the implementation of an EMP and MPCP. The MPCP sets out emergency response procedures to minimise the scale and duration of any spill should one occur.

6.4.1.190 6.4.1.88 **Given the inherent low likelihood of an accidental pollution event from vessel activity and other activities, as well as the proposed avoidance/ impacts reductionthe highly localised nature of any potential exposure, and the mitigation measures (as set out in Table 6.7), it is concluded that there iswill be no potential for AEoI from accidental pollution onof the harbour porpoise QI of the Blackwater Bank SAC, as defined by theits COs of the site, impacting harbour porpoise from, as a result of accidental pollution associated with the construction and decommissioning phase for Project Design Option 1.**

6.4.1.191 6.4.1.89 **Based on the increasedrepresentative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

OPERATIONAL AND MAINTENANCE PHASE ASSESSMENT

6.4.1.90 There is the potential for the accidental release of pollutants during this phase of the Proposed Development as a result of the presence of offshore infrastructure, associated equipment, and vessel movements. The project design parameters for Project Design Option 1 during the operational and maintenance phase are outlined in Table 6.8. This includes synthetic compound, for example from antifouling biocides, heavy metal, and hydrocarbon contamination as a result of the presence of 56 WTGs and two OSPs as well as from maintenance activities. There will also be up to 1,294 vessel round trips and 485 helicopter round trips per year during this phase of the proposed development.

6.4.1.91 The assessment for this phase is the same as for the construction phase, with the same avoidance by design and management measures being implemented to reduce the risk to negligible levels (see Table 6.7 and Section 0). **It is concluded that the potential for AEoI upon the integrity of Blackwater Bank SAC, as defined by the COs of the site, from accidental pollution impacting harbour porpoise from Project Design Option 1 is entirely negligible.**

6.4.1.192 During the operational and maintenance phase, there remains a potential for accidental release of pollutants as a result of the presence of offshore infrastructure, associated equipment, and vessel movements (Table 6.8).

6.4.1.193 The pathways, likelihood and consequences of accidental pollution during this phase are consistent with those assessed for the construction phase. The same avoidance through design and management measures, including the EMP and MPCP (Table 6.7), will be implemented throughout operation and maintenance.

6.4.1.194 **On this basis, it is concluded that there will be no AEoI of the harbour porpoise QI of the Blackwater Bank SAC, as defined by its COs, as a result of accidental pollution during the operational and maintenance phase for Project Design Option 1.**

6.4.1.195 **Based on the representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

6.4.2 Rockabill to Dalkey Island SAC

Harbour porpoise

6.4.2.1 The relevant Annex II marine mammal QI site-specific COs at Rockabill to Dalkey Island SAC is to maintain the favourable conservation condition of the harbour porpoise QI, as defined by the list of attributes and targets set out in Table 5.1 (NPWS, 2013c).

6.4.2.2 Eight potential impacts pathways relevant to harbour porpoise have been identified in relation to the construction, operation and maintenance, and decommissioning of the Proposed Development (Table 6.8). These pathways have been assessed in detail for Blackwater Bank SAC which is also designated for the same Annex II marine mammal QI and is located approximately 19.13 km from the Proposed Development, compared to approximately 35.66 km for Rockabill to Dalkey Island SAC.

6.4.2.3 As the severity and likelihood of all relevant impact pathways are intrinsically distance-dependent, Blackwater Bank SAC represents the closest designated site for harbour porpoise from the Proposed Development. The assessment presented in Section 6.4.1 therefore provides a conservative basis for evaluation and concluded that none of the identified impact pathways would result in an AEoI of Blackwater Bank SAC, with respect to the harbour porpoise QI.

6.4.2.4 Given that the Rockabill to Dalkey Island SAC supports the same Annex II marine mammal QI and lies substantially further from the Proposed Development, the magnitude of effects at Rockabill to Dalkey Island SAC is concluded to be no greater than, and in practice less than, those associated for Blackwater Bank SAC. **It is therefore concluded that there will be no AEoI of the harbour porpoise QI of the Rockabill to Dalkey Island SAC, as defined by its COs, as a result of any of the impacts considered for Project Design Option 1 across any phase.**

6.4.2.5 **Based on the representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

6.4.3 Codling Fault Zone SAC

Harbour porpoise

6.4.3.1 The relevant Annex II marine mammal QI site-specific COs at Codling Fault Zone SAC is to maintain the favourable conservation condition of the harbour porpoise QI, as defined by the list of attributes and targets set out in Table 5.1 (NPWS, 2025a).

6.4.3.2 Eight potential impact pathways relevant to harbour porpoise have been identified in relation to the construction, operation and maintenance, and decommissioning of the Proposed Development (Table 6.8). These pathways have been assessed in detail for Blackwater Bank SAC which is also designated for the same Annex II marine mammal QI and is located approximately 19.13 km from the Proposed Development, compared to approximately 43.90 km for Codling Fault Zone SAC.

6.4.3.3 As the severity and likelihood of all relevant impact pathways are intrinsically distance-dependent, Blackwater Bank SAC represents the closest designated site for harbour porpoise from the Proposed Development. The assessment presented in Section 6.4.1 therefore provides a conservative basis for evaluation and concluded that none of the identified impact

pathways would result in an AEoI of Blackwater Bank SAC, with respect to the harbour porpoise QI.

6.4.3.4 Given that the Codling Fault Zone SAC supports the same Annex II marine mammal QI and lies substantially further from the Proposed Development, the magnitude of effects at Codling Fault Zone SAC is concluded to be no greater than, and in practice less than, those assessed for Blackwater Bank SAC. **It is therefore concluded that there will be no AEoI of the harbour porpoise QI of the Codling Fault Zone SAC, as defined by its COs, as a result of any of the impacts considered for Project Design Option 1 across any phase.**

6.4.3.5 ~~6.4.1.92~~ **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

6.4.4 ~~6.4.2~~ Slaney River Valley SAC

Harbour seal

~~6.4.2.1 The conservation objectives for harbour seal at this designated site is to maintain the favourable conservation condition of the feature, how this is defined is presented in Table 5.1.~~

6.4.4.1 The relevant Annex II marine mammal QI site-specific COs at Slaney River SAC is to maintain the favourable conservation condition of the harbour seal, as defined by the following list of attributes and targets (NPWS, 2011a):

- *Access to suitable habitat:* Species range within the site should not be restricted by artificial barriers to site use;
  - This target may be considered relevant to proposed activities or operations that will result in the permanent exclusion of harbour seal from part of its range within the site, or will permanently prevent access for the species to suitable habitat therein; and
  - It does not refer to short-term or temporary restriction of access or range.
- *Breeding behaviour:* The breeding sites should be maintained in a natural condition;
  - This target is relevant to proposed activities or operations that will result in significant interference with or disturbance of (a) breeding behaviour by harbour seal within the site and/or (b) aquatic/terrestrial/intertidal habitat used during the annual breeding season.
  - Operations or activities that cause displacement of individuals from a breeding site or alteration of natural breeding behaviour, and that may result in higher mortality or reduced reproductive success, would be regarded as significant and should therefore be avoided.
- *Moulting behaviour:* The moult haul-out sites should be maintained in a natural condition;
  - This target is relevant to proposed activities or operations that will result in significant interference with or disturbance of (a) moulting behaviour by harbour seal within the site and/or (b) aquatic/terrestrial/intertidal habitat used during the annual moult.
  - Operations or activities that cause displacement of individuals from a moult haul-out site or alteration of natural moulting behaviour to an extent that may ultimately interfere with key ecological functions would be regarded as significant and should therefore be avoided.
- *Resting behaviour:* The resting haul-out sites should be maintained in a natural condition;
  - This target is to proposed activities or operations that will result in significant interference with or disturbance of (a) resting behaviour by harbour seal within the site and/or (b) aquatic/terrestrial/intertidal habitat used for resting.

  - Operations or activities that cause displacement of individuals from a resting haul-out site to an extent that may ultimately interfere with key ecological functions would be regarded as significant and should therefore be avoided.

- *Disturbance:* Human activities should occur at levels that do not adversely affect the harbour seal population at the site:
  - Proposed activities or operations should not introduce man-made energy (e.g. aerial or underwater noise, light or thermal energy) at levels that could result in a significant negative impact on individuals and/or the population of harbour seal within the site. This refers to the aquatic habitats used by the species in addition to important natural behaviours during the species' annual cycle;
  - This target also relates to proposed activities or operations that may result in the deterioration of key resources (e.g. water quality, feeding, etc.) upon which harbour seals depend. In the absence of complete knowledge on the species ecological requirements at this site, such considerations should be assessed where appropriate on a case-by-case basis.

6.4.4.2 ~~6.4.2.2~~ There are ~~four key~~seven potential impacts ~~on~~pathways relevant to harbour seal associated with the construction, operational and maintenance, and decommissioning of the Proposed Development, ~~which are presented~~as identified in Table 6.8 and are assessed below for each phase of the Proposed Development.

INJURY AND/OR DISTURBANCE FROM UNDERWATER NOISE FROM PILING

~~6.4.2.3 Underwater noise has the potential to impact marine mammals if the frequency is within their hearing range, and in particular if the sound levels are greater than the relevant thresholds. With consideration of harbour seals, they are within the Phocid (in water, PCW) hearing group with a hearing range of 50 hz to 86 kHz. The impacts can range from auditory injury, disturbance and displacement, to changes in behaviour including masking depending on the severity of the underwater noise. The sources of underwater noise within this assessment are piling, UXO clearance, and pre-construction geophysical surveys. Noise disturbance from vessel movements and presence is assessed in the vessel movements assessment (Section 0 to 0).~~

~~6.4.2.4 Exposure to loud underwater noises can lead to a reduction in hearing sensitivity which may be temporary (TTS) or permanent (PTS). PTS is defined by Southall *et al.* (2007) as a non-recoverable elevation of the hearing threshold of 6 dB. It has been assumed that PTS-onset occurs after TTS has grown to 40 dB, based on TTS growth rates obtained from scientific literature.~~

~~6.4.2.5 Any threshold shifts in hearing caused by pile driving would manifest in the range of 2 – 10 kHz (Kastelein *et al.*, 2017). At a BEIS-funded export elicitation workshop in 2018, experts concluded that the probability of PTS significantly affecting the survival and reproduction of grey and harbour seals was very low, assuming a 6 dB PTS in the 2 – 10 kHz range (Booth and Heinis, 2018). This was further supported by conclusions found in the study of tagged seals during the construction of the Lincs offshore windfarm which concluded that neither the survival or fitness of individuals is affected or that seals are not developing PTS despite predictions of exposure that indicate that they should be.~~

~~6.4.2.6 With regards to underwater noise produced by UXO clearance, there are two activities that produce noise, higher order detonation, and low-order clearance methods. It is unknown if there are UXO that require clearance at the time of this assessment, and therefore is unknown to what level of clearance will be carried out. Therefore, this assessment is based on high-order UXO clearance being carried out which is viewed as the worst-case scenario in terms of underwater noise generation.~~

6.4.2.7 The main underwater noise produced by high-order detonation is outside of the region of greatest sensitivity for seal species (Southall *et al.,* 2019), and there is a pronounced reduction in energy levels above ~5-10 kHz (von Beckmann *et al.,* 2015 and Salomons *et al.,* 2021). Due to this, with consideration of the above sensitivity, it is concluded that harbour seals have a low sensitivity to this effect.

6.4.2.8 With regards to underwater noise produced by geophysical surveys, exact surveys and equipment is yet to be decided, therefore as a precautionary approach we have considered all types of noise generation from the varied survey types. Surveys such as multibeam EchoSounder (MBES) and side scan sonar (SSS) produce sounds which are sonar based and impulsive. Surveys comprising of vibrocoring typically produce non-implusive sound. The equipment's noise source levels is provided in Table 6.9 and Table 6.10.

6.4.2.9 Very limited information exists on the impacts of site surveys (geophysical and geotechnical) to marine mammals, with most available studies investigating the use of seismic airguns and focused on cetaceans, not seals. With consideration that seals have a lower sensitivity to underwater noise compared to cetaceans, we will consider studies on cetaceans on a precautionary basis, assuming that any predicted impact would be reduced with the species low sensitivity.

6.4.2.10 A study by Lucke *et al.* (2009) indicated that TTS could be induced in harbour porpoise at 350 m when exposed to an airgun impulse at a peak pressure of 200 dB_{pk-pk} re 1 µPa with corresponding SEL of 164.5 dB re $\mu Pa^2{}_s$) in shallow waters (~4 m), however this study is highly conservative as it assumes that the animal would remain stationary throughout the exposure. Evidence from other studies suggests that harbour porpoises exposed to such noise sources would likely move away from the source, and therefore leave the impact range of PTS-onset (Hermannsen *et al.,* 2015).

6.4.2.11 Furthermore, it is expected that vessel presence will act as a deterrent to harbour porpoise, reducing the risk of auditory injury (Benhemma-Le Gall *et al.*, 2023). Therefore, it is highly unlikely that harbour porpoise will be present in the immediate vicinity at the start of any survey activity. The same can be applied to harbour seal which we view would be highly unlikely to be present within the immediate vicinity, and with consideration of their reduced sensitive, conclude this is a negligible risk for injury.

6.4.2.12 While PTS is a permanent effect which cannot be recovered from, the most likely response of a marine mammal to noise levels that could induce TTS is to flee the area (Southall et al., 2007). Therefore, animals exposed to these noise levels that could induce TTS are likely to actively avoid hearing damage by moving away from the source.

6.4.4.3 Seals use sound both in air and water for communication, predator avoidance, and reproductive interactions, and are less dependent on hearing for foraging than cetaceans (Deecke *et al.*, 2002). Seals have very well developed tactile sensory systems that are used for foraging, but in certain conditions they may also listen to sounds produced by vocalising fish whilst hunting for prey (Dehnhardt *et al.,* 2001; Shulte-Pelkum *et al.*, 2007).

6.4.4.4 With consideration of harbour seals, they are within the Phocid Carnivore in Water (PCW) FHG with a hearing range of 50 Hz to 86 kHz (Southall *et al.*, 2019). Underwater noise-generating activities associated with the Proposed Development therefore have the potential to result in auditory injury, behavioural disturbance or temporary displacement, depending on noise level, duration and proximity.

6.4.4.5 For each mitigated piling scenario (see Section 6.4.1.12), predicted impacts were informed by a single modelled average at-sea density estimate across the Array Area and Cable Corridor and Working Area (0.0003 animals/km^2; Table 6.6) and using the thresholds for impulsive noise outlined in Table 6.9. Full details of the underwater noise modelling methodology and the resulting impact areas and ranges are detailed in the Underwater Noise Assessment (NIS Volume III, Appendix 11.1: Underwater Noise Assessment (Revised March 2026)).

AUDITORY INJURY (PTS)

6.4.4.6 Predicted impact areas and maximum ranges for auditory injury (PTS-onset) to harbour seals from pile driving during construction from the Proposed Development, across both mitigated piling scenarios (ramp-up mitigation scenario and extended ramp-up mitigation scenario), are presented in Table 6.19Table 6.19: Predicted impact range of PTS-onset from pile driving at the SW WTG array location with harbour seal density estimates. For further information on densities used; see .

6.4.4.7 For the ramp-up mitigation scenario, the maximum instantaneous PTS-onset impact range was 60 m for the installation of a 11 m monopile at the SW WTG location, which represents the piling location closest to Slaney River Valley SAC (Table 6.19). This equates to a maximum of one individual potentially experiencing auditory injury, representing <0.01% of the reference population of 182 within the East region of RoI (Morris and Duck, 2019).

6.4.4.8 Using the cumulative PTS-onset thresholds, the maximum impact range at the SW WTG location was predicted to be <50 m, equating to a maximum of one individual (<0.01% of the reference population; Table 6.19).

6.4.4.9 With the implementation of the extended ramp-up mitigation scenario, the maximum instantaneous PTS-onset impact range remained at 60 m at the SW WTG location, corresponding to a maximum of one individual (<0.01% of the reference population; Table 6.19: Predicted impact range of PTS-onset from pile driving at the SW WTG array location with harbour seal density estimates. For further information on densities used; see). Predicted cumulative PTS-onset impact ranges also remained at <50 m at the SW WTG location, equating to a maximum of one individual experiencing auditory injury (<0.01% of the reference population; Table 6.19).

6.4.4.10 Overall, predicted auditory injury to harbour seals from pile driving during construction is extremely limited in spatial extent and scale, with the SW WTG location representing the most precautionary and most relevant piling location in relation to Slaney River Valley SAC.

Table 6.19: Predicted impact range of PTS-onset from pile driving at the SW WTG array location with harbour seal density estimates. For further information on densities used; see Table 6.6.

Piling Scenario	Piling location and Monopile diameter (m)		Density (animals/km²)	Area (km²)	Maximum range (m)	Number of animals[1,2]	Percentage of reference population[2] (%)
Instantaneous PTS-onset (unweighted SPL_{peak})							
Ramp-up mitigation scenario	SW WTG	11 m	0.0003	0.01	60	<1	<0.01
Extended ramp-up mitigation scenario	SW WTG	11 m	0.0003	0.01	60	<1	<0.01
Cumulative PTS-onset (weighted SEL_{cum})							
Ramp-up mitigation scenario	SW WTG	11 m	0.0003	<0.01	<50	<1	<0.01
Extended ramp-up mitigation scenario	SW WTG	11 m	0.0003	<0.01	<50	<1	<0.01

[1]*The predicted number of individuals exposed to PTS-onset (both instantaneous and cumulative) from pile driving is fewer than one animal across all density scenarios. Importantly, the maximum PTS-onset impact range falls entirely within the 1,000 m Rsafe mitigation distance. With the implementation of the extended ramp-up mitigation procedure and associated MMMP measures (monitoring and soft-start procedures), marine mammals are expected to be displaced from the impact area prior to the onset of full hammer energy. Consequently, no animals are expected to be exposed to sound levels capable of causing auditory injury (PTS).*

[2]*The number of animals disturbed and the reference population are representative of the scaled East region of RoI population (Morris and Duck, 2019). The number of animals disturbed is not representative of the numbers disturbed within the Slaney River Valley SAC.*

6.4.4.11 Any threshold shifts in hearing caused by pile driving would manifest in the range of 2 – 10 kHz (Kastelein *et al.*, 2017). At a UK BEIS-funded export elicitation workshop in 2018, experts concluded that the probability of PTS significantly affecting the survival and reproduction of grey and harbour seals was very low, assuming a 6 dB PTS in the 2 – 10 kHz range (Booth *et al.*,, 2019).

6.4.4.12 Calculations of SEL_{ss} of tagged seals during the construction of the Lincs offshore windfarm (which is located in the Southern North Sea, UK) estimated that at least 50% of tagged seals would have received sound exposure exceeding published thresholds for PTS (Hastie *et al.*, 2015). However, these thresholds have since been updated in Southall *et al.* (2019), and therefore the proportion predicted to exceed current PTS-onset thresholds would now be expected to be lower. For example, Whyte *et al.* (2020) found that the percentage of tagged harbour seals predicted to experience PTS-onset varied from 0 to 17% depending on the onset threshold applied.

6.4.4.13 The extensive offshore windfarm construction that has occurred in the southern North Sea over the past decade, and the degree of overlap between these developments and the foraging ranges of harbour seals from The Wash and North Norfolk Coast SAC, indicate that a large number of individuals from this SAC population have likely been exposed to levels of sound with the potential to exceed PTS-onset thresholds (Russell *et al.*, 2016). However, the continued increase in the harbour seal population at the Wash and North Norfolk SAC during this period suggests that either the survival and fitness of individuals have not been measurably affected, or that seals did not develop PTS despite predictions of exposure, supporting the conclusion that population-level effects at SAC scale are unlikely.

6.4.4.14 In addition, the Developer has committed to the implementation of project-specific mitigation measures during piling activities, as set out within the MMMP (NIS Volume III, Appendix 25.2: Marine Mammal Mitigation Plan (Revised March 2026)), which are applicable to both cetacean and pinniped receptors. These measures are designed to minimise the risk of auditory injury (PTS) to seals arising from piling-related underwater noise to a negligible level and will, as a minimum, adhere to relevant international best practice, including DAHG (2014) guidance (Table 6.7).

6.4.4.15 In relation to the site-specific COs for Slaney River Valley SAC (Table 5.1), the potential effects of underwater noise associated with pile driving on harbour seals have been assessed with respect to the attributes of access to suitable habitat and disturbance. The breeding, moulting and resting behaviour attributes relate specifically to disturbance or physical alteration of haul-out sites within the SAC boundary. As the Proposed Development is located approximately 47.55 km from the Slaney River Valley SAC and will not result in any direct or indirect effects on haul-out habitats within the site, these attributes are not considered further within this assessment.

6.4.4.16 Regarding access to suitable habitat attribute, pile driving activities and the associated underwater noise (which could potentially cause auditory injury) will be short-term and temporary in nature and will not result in permanent habitat exclusion or create an artificial barrier to site use. Predicted PTS-onset impact ranges (maximum of 60 m) are smaller than the distance to Slaney River Valley SAC, which is located approximately 47.55 km from the closest piling location, and therefore do not overlap the SAC boundary. As such, harbour seals within the SAC will not be exposed to levels of underwater noise capable of resulting in auditory injury. Any highly unlikely auditory injury to individuals occurring outside the SAC would not impede access to suitable habitat within the site.

6.4.4.17 Regarding the disturbance attribute, even in the highly unlikely event that an individual experienced PTS-onset, available evidence indicates that would be unlikely to significantly affect individual fitness (i.e. its ability to survive and reproduce; Kastelein *et al.*, 2017). Therefore, pile driving activities are not expected to introduce man-made energy at levels capable of causing significant negative effects on individual harbour seals or the wider population associated within,

or connected to, Slaney River Valley SAC, nor is it expected to cause injury or mortality at levels capable of affecting site integrity.

6.4.4.18 **With consideration of the implementation of the extended ramp-up scenario and project-specific MMMP measures ensuring that no animals are within the area of predicted auditory injury (PTS-onset) ranges, the absence of overlap with the SAC (with the greatest predicted impact range of up to 60 m), and the negligible proportion of the wider population potentially affected (<0.01%), it is concluded there will be no AEoI of the harbour seal QI of the Slaney River Valley SAC, as defined by its COs, as a result of auditory injury due to underwater noise associated with piling for Project Design Option 1.**

6.4.4.19 **Based on the representative risk of effect of Project Design Option 1, it is considered that the same conclusion of no AEoI would apply to Project Design Option 2.**

BEHAVIOURAL DISTURBANCE

6.4.4.20 The number of harbour seals predicted to experience behavioural disturbance as a result of pile driving during construction is presented in Table 6.20. Disturbance was quantified using the dose-response relationship for impulsive noise for harbour seals developed by Whyte *et al.* (2020) and expressed as a proportion of the relevant reference population (Table 6.6).

6.4.4.21 The dose-response function used is derived from harbour seal telemetry data collected during pile driving activities at the Lincs offshore windfarm in 2011 and 2012, which documented the percentage change in harbour seal density in response to pile driving. For the purposes of this assessment, a precautionary approach has been applied, whereby all harbour seals exposed to SEL_{SS} exceeding 180 dB re 1 μPa^2s are assumed to experience behavioural disturbance (Whyte *et al.*, 2020).

6.4.4.22 For the both the ramp-up mitigation and extended ramp-up mitigation scenarios, using the uniform density estimate of 0.0003 animals/km^2 extracted from Carter *et al.* (2020), it is estimated that a maximum of one harbour seal (0.55% of the reference population of 182 within the East region of RoI (Morris and Duck, 2019) may experience behavioural disturbance as a result of pile driving at all piling locations (Table 6.20Table 6.9~~: Underwater noise produced by geophysical survey techniques11~~).

6.4.4.23 At its maximum extent, the predicted 145 dB SEL_{ss} re 1 μPa^2s disturbance contour does not intersect the boundary of Slaney River SAC (Figure 6.14). The closest point of the SAC is located approximately 16.55 km beyond the outer edge of the disturbance contour generated by piling at the closest point (SW WTG).

Table 6.20: Predicted impact of disturbance to harbour seal from pile driving at SW WTG location using dose-response curves. For further information on densities used; see Table 6.6

Piling Scenario	Piling location and Monopile diameter (m)		Density (animals/km^2)	Number of animals disturbed[1]	Percentage of reference population[1] (%)
Ramp-up and extended ramp-up mitigation scenarios	SW WTG	11 m	0.0003	1	0.55

[1]The number of animals disturbed and the reference population are representative of the scaled East region of RoI population (Morris and Duck, 2019). The number of animals disturbed is not representative of the numbers disturbed within the Slaney River Valley SAC.

6.4.4.24 Furthermore, the results of the iPCoD modelling show that there is no significant effect of disturbance resulting from pile driving at the Proposed Development to harbour seal populations, with the impacted population predicted to continue at a stable trajectory at exactly the same size (100%) as the un-impacted population up to 24 years after piling has ceased.

6.4.4.25 ~~6.4.2.13~~ With consideration of disturbance and displacement caused by activities such as piling, empirical studies ~~have shown~~indicate that 19-83% of tagged harbour seals ~~are displaced~~may exhibit temporary displacement during piling activities, with significant ~~reduction in~~reductions in local abundance reported up to 25 km from the piling ~~activity (Russell~~location (Russell *et al.,* 2016). However, ~~seals returned to the area~~these effects are short-term, with seals typically returning to affected areas in similar densities ~~to beforehand~~ within ~~2~~approximately two hours of cessation of ~~the~~ piling ~~activity, suggesting the displacement caused by piling activities is only short-term. Furthermore, evidence~~. This supports the ~~assessment that~~ conclusion that displacement effects are temporary and reversible.

6.4.4.26 Harbour seals are ~~able to reasonable compensate for missed~~also considered capable of compensating for short-term disturbance due to their generalist diet, high mobility and physiological capacity to tolerate temporary reductions in foraging opportunities ~~caused by disturbance and can~~. Individuals may range to up to 273 km from a haul-out to forage (Carter *et al.,* 2022, Booth *et al.,* 2019). ~~During the~~ Expert elicitation ~~workshop in 2018, the experts also agreed~~further concluded that harbour seals ~~have a reasonable ability to compensate for missed foraging opportunities from~~are unlikely to experience adverse effects on survival and reproduction as a result of intermittent disturbance ~~(~~from exposure to ~~low frequency~~low-frequency broadband ~~pulsed noise~~impulsive noise, such as piling driving~~) due to their generalist diet, adequate fat stores, mobility, and life-history traits~~ (Booth *et al.*, 2019)~~, for example, they have a thick layer of blubber for energy storage that enables them to tolerate periods of fasting when hauled out between foraging trips or during breeding and moulting periods.~~. However, behavioural disturbance of harbour seals could have an effect on both survival (if it results in the separation of a pup from its mother), and reproduction via body condition (if it results in the animal spending less time feeding or conserving energy by resting; Booth *et al.*, 2019).

~~6.4.2.14 Available guidance on assessing the significance of noise disturbance from UXO detonation against the conservation objectives of SACs with harbour seals as qualifying interests is limited, however the closest relevant guidance is with regards to harbour porpoise SACs within England,~~

~~Wales and Northern Ireland. As a species is considered to be more sensitive to these impacts than seals we have adopted that guidance on a precautionary basis, and impacts are viewed to likely be lesser. The guidance recommends an effective deterrence range (EDR) of 26 km for high-order detonations (JNCC, 2020). It should be noted that this EDR is based upon avoidance from piling, not UXO clearance, and the same guidance states that '*a one off explosion would probably only elicit a startle response and would not cause widespread and prolonged displacement*'. With consideration of the resilience of the species highlighted above, it is concluded that harbour seal are not sensitive to UXO clearance behavioural disturbance effects when considering the integrity of the designated site.~~

~~6.4.2.15 With consideration of disturbance caused by geophysical and geotechnical surveys, there are also few studies on the effects of seismic airguns on seals. Detailed observations of the behavioural and physiological responses of harbour seal were recorded by Thompson *et al.* (1998) using controlled exposure experiments with small air guns (source levels of 215-224 dB re 1µPa peak-to-peak). These experiments showed that grey seals exhibit avoidance behaviour when exposed to a single airgun or small array, switching from foraging to transiting behaviour, whilst harbour seals exhibited dramatic avoidance behaviour and stopped feeding (Thompson *et al.*, 1998). With consideration of the above behavioural effects of piling, it is anticipated that harbour seals will show similar levels of avoidance and return behaviours, just within a smaller area based on the reduced distance the noise produced will go in comparison to piling.~~

~~6.4.2.16 The assessment has been informed by the Underwater Noise Assessment by Subacoustech (Volume III, Appendix 11.1) which includes the results of numerical modelling using the INSPIRE underwater noise model.~~

6.4.4.27 For harbour seals, the project-specific mitigation measures set out within the MMMP (NIS Volume III, Appendix 25.2: Marine Mammal Mitigation Plan (Revised March 2026)), although primarily designed to minimise the risk of auditory injury (PTS) arising from piling-related underwater noise, will also act to reduce the magnitude and spatial extent of behavioural disturbance. Measures including pre-activity monitoring and controlled initiation of piling will reduce the likelihood of seals being exposed to the highest sound levels, thereby limiting the potential for strong avoidance or displacement responses. As a result, any behavioural disturbance experienced by seals is expected to be temporary and reversible and not of a scale or duration that would undermine the relevant COs.

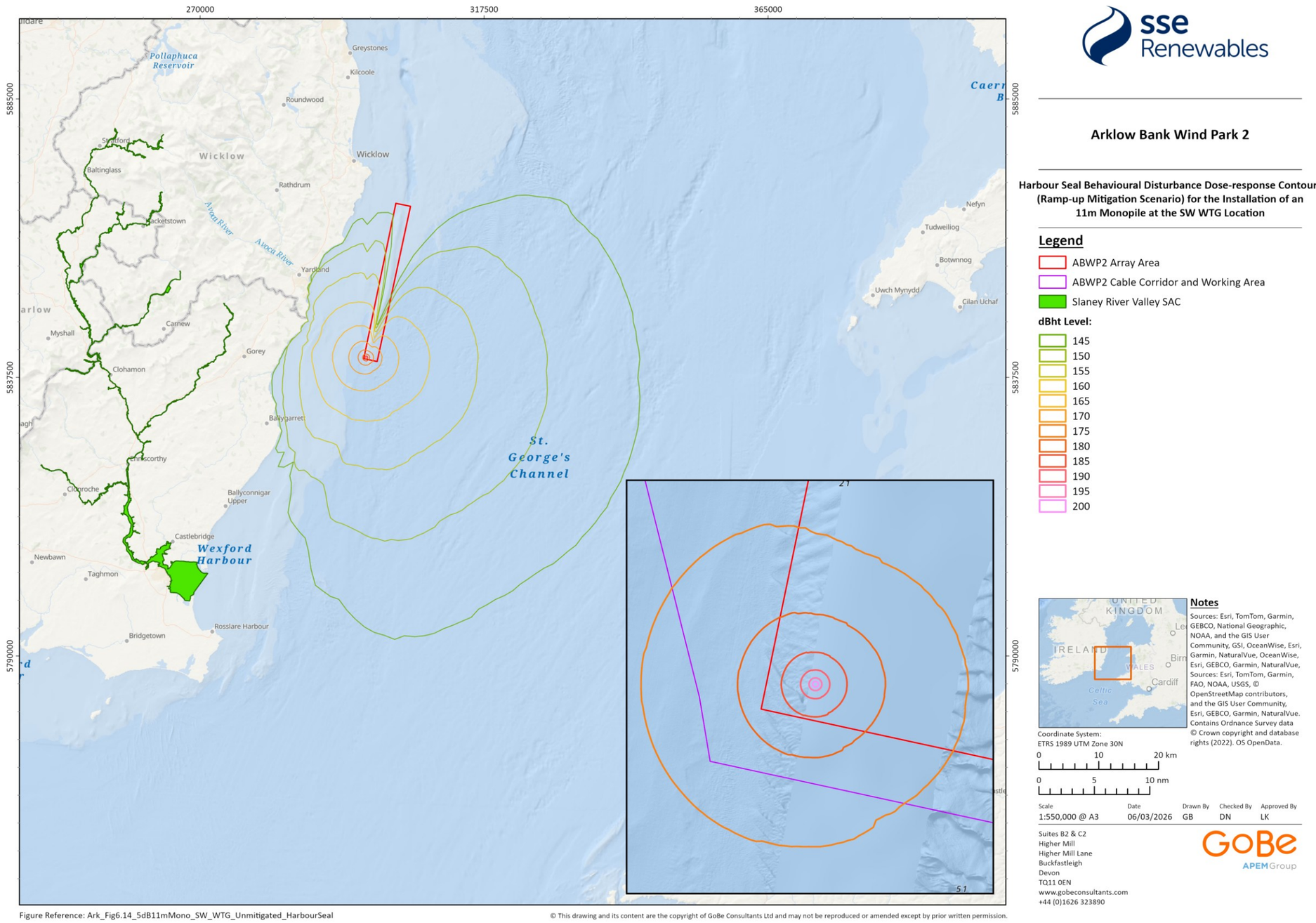
6.4.4.28 In relation to the site-specific COs for Slaney River Valley SAC (Table 5.1), the potential effects of underwater noise associated with pile driving on harbour seals have been assessed with respect to the attributes of access to suitable habitat and maintain human activities below levels which would adversely affect the harbour seal population at the site (disturbance). The COs relating to breeding, moulting, and resting behaviour are not considered further in this assessment, as pile driving activities will occur entirely outside the SAC and will not affect haul-out sites or habitats used for these behaviours. This conclusion is based on the spatial separation between piling activities and the SAC, and the absence of any pathway by which underwater noise could affect haul-out-dependent behaviours.

6.4.4.29 While underwater noise generated from piling may result in temporary behavioural responses and short-term displacement of harbour seals, such effects are restricted to the duration of the piling activity and do not constitute permanent barriers to site use. In line with the latest supporting guidance for the Slaney River Valley SAC (NPWS, 2011a), short-term and reversible disturbance does not represent a restriction of species range or access to suitable habitat within the SAC.

6.4.4.30 Some individuals associated with the Slaney River Valley SAC (but none within the Slaney River Valley SAC itself) may experience temporary behavioural disturbance as a result of pile driving; however, this is not predicted to result in mortality, injury, or significant negative effects on individual fitness or reproductive success for any life stage, nor is it expected to affect the harbour seal population at the site.

6.4.4.31 **With consideration of the precautionary nature of the assessment, the low proportion of the population predicted to be exhibit a behavioural response, the implementation of mitigation measures, and the recoverable and temporary (although repeated) nature of behavioural disturbance, it is concluded there will be no AEoI of the harbour seal QI of the Slaney River Valley SAC, as defined by its COs, as a result of behavioural disturbance due to underwater noise during pile driving for Project Design Option 1.**

6.4.4.32 **Based on the representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**



sse Renewables

Arklow Bank Wind Park 2

Harbour Seal Behavioural Disturbance Dose-response Contours (Ramp-up Mitigation Scenario) for the Installation of an 11m Monopile at the SW WTG Location

Legend

- ABWP2 Array Area
- ABWP2 Cable Corridor and Working Area
- Slaney River Valley SAC

dBht Level:

- 145
- 150
- 155
- 160
- 165
- 170
- 175
- 180
- 185
- 190
- 195
- 200

Notes

Sources: Esri, TomTom, Garmin, GEBCO, National Geographic, NOAA, and the GIS User Community, GSI, OceanWise, Esri, Garmin, NaturalVue, OceanWise, Esri, GEBCO, Garmin, NaturalVue, Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community, Esri, GEBCO, Garmin, NaturalVue. Contains Ordnance Survey data © Crown copyright and database rights (2022). OS OpenData.

Coordinate System:
ETRS 1989 UTM Zone 30N

0 10 20 km

0 5 10 nm

Scale	Date	Drawn By	Checked By	Approved By
1:550,000 @ A3	06/03/2026	GB	DN	LK

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Figure Reference: Ark_Fig6.14_5dB11mMono_SW_WTG_Unmitigated_HarbourSeal

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Figure 6.14: Behavioural disturbance dose-response contours (ramp-up mitigation scenario) for the installation of an 11 m monopile at the SW WTG location and Slaney River Valley SAC for harbour seal QI

CONSTRUCTION ~~AND DECOMMISSIONING~~PHASE ASSESSMENT

~~6.4.2.17 Piling will only be carried out during the construction phase of the Proposed Development. Decommissioning would be undertaken using similar plant and techniques to the construction phase without piling and with fewer vessels and equipment used. It is therefore viewed to have a lower potential for impact compared to the construction phase. Based on calculations and data presented in Table 6.14 : PTS-onset from pile driving and disturbance at array locations with harbour seal densities estimates it is calculated that the maximum instantaneous PTS-onset impact range is 60 m (11 m monopile at the SW location and 7 m or 14 m monopile at the S-OSP location) with other piling locations having a reduced range. Based on this modelling and the survey results no seals are expected to be impacted. Using the cumulative PTS-onset thresholds, the maximum impact range is 500 m (for an 11 m monopile at the C location, all other locations have a reduced impact range), which still calculates as no seals being impacted by these activities. With consideration of TTS, it is only a temporary physical and behavioural impact, and considering evidence clarified above with the assessment of the PTS impacts, and further consideration of behavioural impacts within this assessment, it poses a negligible risk of AEoI to the QI as all impacts are short term and temporary. With additional consideration of the avoidance through project design incorporated into the activities, specifically the MMMP, this will serve to further minimise any risk posed to harbour seals.~~

~~6.4.2.18 With regards to UXO clearance, based on the modelling presented in~~ Table 6.~~15~~21~~, the maximum PTS-onset impact range is 2.8 km. This would result in <1 harbour seal (<0.01% of the population) experiencing PTS from a high-order detonation with the greatest charge weight.~~

AUDITORY INJURY (PTS)

6.4.4.33 Based on the modelling results presented in Table 6.~~15~~21, the maximum PTS-onset range for harbour seals resulting from high order UXO clearance is 2.8 km, based on the unweighted SPL_{peak} criterion and the largest charge weight modelled (800 kg plus donor). Using the average density estimate scaled from count data (Carter *et al.*, 2020), this would result in up to one harbour seal, representing <0.01% of the reference population of 182 within the East region of RoI (Morris and Duck, 2019), being within PTS-onset range under the most precautionary scenario.

6.4.4.34 For low order clearance, the predicted PTS-onset ranges are substantially smaller, with a maximum range of 0.24 km (Table 6.~~15~~21). At this range, no harbour seals are predicted to experience PTS.

Table 6.14 : PTS-onset from pile driving and disturbance at array locations with harbour seal densities estimates

Piling location and Monopile		Density (animals/km²)	Area (km²)	Maximum range (m)	Number of animals	% of reference population
Instantaneous PTS-onset (unweighted SPLpeak)						
NW	7 m	0.0003	<0.001	<50	0	0.00
	11 m		0.01	<50	0	0.00
C	7 m	0.0003	0.01	50	0	0.00
	11 m		0.01	50	0	0.00
SW	7 m	0.0003	0.01	<50	0	0.00
	11 m		0.01	60	0	0.00
N-OSP	7 m	0.0003	0.01	<50	0	0.00
	14 m		0.01	<50	0	0.00

Piling location and Monopile		Density (animals/km²)	Area (km²)	Maximum range (m)	Number of animals	% of reference population
S-OSP	7 m	0.0003	0.01	60	0	0.00
	14 m		0.01	60	0	0.00
Cumulative PTS-onset (weighted SELcum)						
NW	7 m	0.0003	<0.001	<50	0	0.00
	11 m		0.01	<50	0	0.00
C	7 m	0.0003	0.3	400	0	0.00
	11 m		0.3	500	0	0.00
SW	7 m	0.0003	0.1	380	0	0.00
	11 m		0.2	400	0	0.00
N-OSP	7 m	0.0003	<0.1	<100	0	0.00

Piling location and Monopile		Density (animals/km²)	Area (km²)	Maximum range (m)	Number of animals	% of reference population
	14 m		<0.1	<100	0	0.00
S-OSP	7 m	0.0003	<0.1	200	0	0.00
	14 m		<0.1	200	0	0.00
Predicted disturbance						
NW	7 m	0.0003	-	-	<1	0.23
	11 m		-	-	<1	0.24
C	7 m	0.0003	-	-	<1	0.48
	11 m		-	-	<1	0.48
SW	7 m	0.0003	-	-	<1	0.53
	11 m		-	-	<1	0.53

Piling location and Monopile		Density (animals/km²)	Area (km²)	Maximum range (m)	Number of animals	% of reference population
N-OSP	7 m	0.0003	-	-	<1	0.28
	14 m		-	-	<1	0.28
S-OSP	7 m	0.0003	-	-	<1	0.53
	14 m		-	-	<1	0.54

Table 6.~~15~~21: PTS-onset ranges and numbers of harbour seal modelled to be within range for all potential charge weights

Charge Weight (kg)	Maximum range (~~m~~km)	Density ~~of species~~ (animals/~~km²~~km²)	Number of ~~animals~~animals[1]	~~%~~Percentage of reference ~~population~~population[1] (%)
PTS-onset (unweighted SPL_{peak})				
0.5 (low order)	~~240~~0.24	0.0003	0	~~0~~0.00
25 + donor	~~910~~0.91	0.0003	0	~~0~~0.00
55 + donor	~~1,100~~1.1	0.0003	0	~~0~~0.00
120 +donor	~~1,500~~1.5	0.0003	0	~~0~~0.00
240 + donor	~~1,900~~1.9	0.0003	0	~~0~~0.00
525 + donor	~~2,500~~2.5	0.0003	<1	<0.01
700 + donor	~~2,700~~2.7	0.0003	<1	<0.01
800 + donor	~~2,800~~2.8	0.0003	<1	<0.01

Charge Weight (kg)	Maximum range (~~m~~km)	Density ~~of species~~ (animals/~~km~~^{2}km^2)	Number of ~~animals~~animals[1]	~~%~~Percentage of reference ~~population~~population[1] (%)
PTS-onset (weighted SELss)				
0.5 (low order)	~~60~~0.06	0.0003	0	~~0~~0.00
25 + donor	~~390~~0.39	0.0003	0	~~0~~0.00
55 + donor	~~570~~0.57	0.0003	0	~~0~~0.00
120 +donor	~~830~~0.83	0.0003	0	~~0~~0.00
240 + donor	~~1,100~~1.1	0.0003	0	~~0~~0.00
525 + donor	~~1,600~~1.6	0.0003	0	~~0~~0.00
700 + donor	~~1,900~~1.9	0.0003	0	~~0~~0.00
800 + donor	~~2,000~~2.0	0.0003	0	~~0~~0.00

Charge Weight (kg)	Maximum range (~~m~~km)	Density ~~of species~~ (animals/~~km²~~km²)	Number of ~~animals~~animals[1]	~~%~~Percentage of reference ~~population~~population[1] (%)
~~Disturbance~~[1] *The number of animals disturbed and the reference population are representative of the scaled East region of RoI population (Morris and Duck, 2019). The number of animals disturbed is not representative of the numbers disturbed within the Slaney River Valley SAC.*				
~~High Order Clearance~~	~~26,000~~	~~0.0003~~	~~1~~	~~0.35~~
~~Low Order Clearance~~	~~5,000~~	~~0.0003~~	~~<1~~	~~0.01~~

6.4.2.19 ~~**Therefore, it is concluded there will be no AEoI upon the integrity of Slaney River Valley SAC as a result of injury from underwater noise impacting harbour seal from Project Design Option 1.**~~

6.4.4.35 The nearest boundary of the Slaney River Valley SAC is located approximately 47.55 km from the Proposed Development. As such, even under the largest charge weight modelled, the predicted PTS-onset ranges for both high-order and low-order UXO clearance do not overlap with the SAC. Therefore, no harbour seals within the SAC are predicted to experience auditory injury as a result of UXO clearance activities associated with the Proposed Development.

6.4.4.36 Interpretation of the modelling results should take account of the frequency characteristics of high-order UXO detonation. The main underwater noise produced by high-order detonation is outside of the region of greatest sensitivity for seal species (Southall *et al.,* 2019), with a pronounced reduction in energy levels above approximately 5-10 kHz (von Benda-Beckmann *et al.,* 2015; Salomons *et al.,* 2021). On this basis, harbour seals are considered to have a relatively low sensitivity to PTS-onset from UXO clearance.

6.4.4.37 Furthermore, the Developer has committed to the implementation of project-specific mitigation measures for UXO clearance activities, as set out within the MMMP (NIS Volume III, Appendix 25.2: Marine Mammal Mitigation Plan (Revised 2026)). These are designed to minimise the risk of auditory injury (PTS) to marine mammals arising from UXO-related noise. The mitigation strategy will, as a minimum, adhere to relevant international best practice, including DAHG (2014) guidance (Table 6.7).

6.4.4.38 In relation to the site-specific COs for Slaney River Valley SAC (Table 5.1), the potential effects of underwater noise associated with UXO clearance on harbour seals have been assessed with respect to the attributes of access to suitable habitat and maintaining human activities below levels which would adversely affect the harbour seal population (disturbance). The breeding, moulting and resting behaviour attributes are not considered relevant to the assessment of UXO clearance, as the proposed activities will occur outside of the SAC, with impacts 47.55 km from the SAC boundary and therefore at greater distances from any haul-out or breeding sites within the Slaney River SAC and will not result in any direct or indirect effects on haul-out habitats within the site. Consequently, these attributes are not considered further within this assessment.

6.4.4.39 UXO clearance events and the associated underwater noise capable of causing auditory injury, would be short-term and highly localised, typically comprising a single, one-off detonation at any given location. As such, UXO clearance would not create a permanent or long-term barrier to the use of suitable habitat within or connected to the SAC, nor would it result in any sustained exclusion of harbour seals from the wider area.

6.4.4.40 Regarding the disturbance attribute, even in the highly unlikely event that an individual experienced PTS-onset, available evidence indicates that would be unlikely to significantly affect individual fitness (i.e. its ability to survive and reproduce; Kastelein *et al.*, 2017). Therefore, any UXO clearance activities are not expected to introduce man-made energy at levels capable of causing significant negative effects on individual harbour seals or the wider population associated within, or connected to, Slaney River Valley SAC, nor is it expected to cause injury or mortality at levels capable of affecting site integrity.

6.4.4.41 **With consideration of the very limited spatial extent of predicted auditory injury (PTS-onset) ranges, the absence of overlap with the SAC (with the greatest predicted impact range of up to 2.8 km), the implementation of mitigation measures, and the negligible proportion of the wider population potentially affected (<0.01%) even under the most precautionary scenario, it is concluded there will be no AEoI of the harbour seal QI of the Slaney River Valley SAC, as defined by its COs, as a result of auditory injury due to underwater noise associated with UXO clearance for Project Design Options 1 and 2.**

BEHAVIOURAL DISTURBANCE

6.4.4.42 The number of harbour seals predicted to experience behavioural disturbance as a result of high order UXO detonation, based on the application of a 20 km EDR, is presented in Table 6.22. Using the density estimate of 0.0003 animals/km^2, it is estimated that up to one individual (<1% of the East region of the RoI reference population of 182 animals; Morris and Duck (2019)) could be disturbed under this highly precautionary scenario.

6.4.4.43 For low order clearance, application of the 5 km EDR results in up to 1 animal potentially disturbed, representing <1% of the reference population (Table 6.22). It should be noted that this estimate is illustrative only, as there is only limited empirical evidence to support a defined disturbance range for low order UXO clearance.

Table 6.22: Predicted impact of disturbance to harbour seals from UXO for both high order (20 km) and low order clearance (5 km) EDRs. For further information on densities used, see Table 6.6.

UXO Scenario	EDR	Density (animals/km^2)	Number of animals disturbed[1]	Percentage of the reference population[1] (%)
High Order Clearance	20 km^2	0.0003	<1	0.19
Low Order Clearance	5 km	0.0003	1	0.55

[1]The number of animals disturbed and the reference population are representative of the scaled East region of RoI population (Morris and Duck, 2019). The number of animals disturbed is not representative of the numbers disturbed within the Slaney River Valley SAC.

[2]Reduced EDR to account for land overlap within the nominal 20 km radius (effective area 1,159.98 km^2 rather than 1,256.31 km^2)

~~6.4.2.20 **Based on the increased risk of effect of design option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**~~

~~6.4.2.21 Based on the conclusions within Table 6.14 : PTS-onset from pile driving and disturbance at array locations with harbour seal densities estimates, it is estimated that less than one harbour seal will experience behavioural disturbance from underwater noise from piling. Other sources of disturbance (UXO clearance and surveys) are anticipated to result in less disturbance than the piling. Within consideration of the minimal number of seals predicted to be impacted and the negligible severity, that this impact is short-term and temporary, it is concluded it is highly unlikely to affect the features' population trends or integrity.~~

6.4.4.44 The nearest boundary of Slaney River Valley SAC is located approximately 47.55 km from the Proposed Development. As such, the EDRs for UXO clearance do not overlap with the SAC. Therefore, no harbour seals within the SAC are predicted to experience behavioural disturbance as a result of UXO clearance activities associated with the Proposed Development.

6.4.4.45 Potential behavioural disturbance to marine mammals arising from UXO clearance activities has been considered through the implementation of the project-specific MMMP (NIS Volume III, Appendix 25.2: Marine Mammal Mitigation Plan (Revised March 2026)). The application of mitigation measures, informed by international best practice including DAHG (2014), to reduce the likelihood, spatial extent and duration of any behavioural responses, such that any disturbance would be temporary, localised and not of a nature that could affect population-level processes (Table 6.7).

6.4.4.46 Any behavioural disturbance associated with UXO clearance is therefore expected to affect a negligible proportion of the population (<1%), be highly localised in time, recoverable, and infrequent during the construction phase. Given the single-pulse nature of UXO clearance, it is concluded that harbour seals are not sensitive to UXO clearance behavioural disturbance effects when considering the integrity of the designated site.

6.4.4.47 In relation to the site-specific COs for Slaney River Valley SAC (Table 5.1), the potential effects of underwater noise associated with UXO clearance on harbour seals have been assessed with respect to the attributes of access to suitable habitat and maintain human activities below levels which would adversely affect the harbour seal population at the site (disturbance). Breeding, moulting, and resting haul-out targets are not relevant as these activities occur inside the SAC and would not be impacted by UXO clearance.

6.4.4.48 Whilst underwater noise generated from UXO clearance may result in a short-term startle response and temporary displacement of some individuals outside of, but associated with the SAC, such disturbance would be brief in duration and would not constitute a permanent barrier to habitat use of the site.

6.4.4.49 Any individuals disturbed by UXO clearance are not predicted to experience significant negative effects on fitness, survival, or reproductive success for any life stage, nor is the activity expected to result in disturbance at a scale capable of affecting the harbour seal population associated with Slaney River Valley SAC.

6.4.4.50 ~~6.4.2.22 **Therefore, it is**~~**With consideration of the precautionary nature of the assessment, the absence of overlap with the SAC, the low proportion of the population predicted to be affected, the extremely short-term and recoverable nature of behavioural disturbance, the implementation of mitigation measures, and the limited frequency of UXO clearance events, it is therefore concluded there will be no AEoI ~~upon the integrity of~~of the harbour seal QI of the Slaney River Valley SAC, as defined by ~~the~~its COs ~~of the site~~, as a result of behavioural disturbance ~~from~~due to underwater noise ~~impacting harbour seal from~~associated with UXO clearance for Project Design ~~Option~~Options 1 and 2.**

INJURY AND/OR DISTURBANCE FROM UNDERWATER NOISE DURING SITE SURVEYS

CONSTRUCTION PHASE ASSESSMENT

6.4.4.51 The Subsea Noise Assessment (Seiche Ltd., 2022) concluded that PTS-onset ranges from confirmatory site surveys are limited to relatively small distances from the sound source and vary by survey type and marine mammal FHG, with harbour seals considered under Phocid pinnipeds (PW).

6.4.4.52 While PTS is a permanent effect which cannot be recovered from, the most likely response of a marine mammal to noise levels that could induce TTS is to flee the area (Southall *et al.,* 2007). Therefore, animals exposed to these noise levels that could induce TTS are likely to actively avoid hearing damage by moving away from the source. As previously mentioned, whilst the TTS impact ranges are presented, the implications of TTS are considered alongside behavioural disturbance, reflecting its temporary and recoverable nature and its relevance to short-term changes in behaviour rather than long-term population level effects.

6.4.4.53 Predicted impact ranges for auditory (PTS-onset) and TTS-onset to harbour seals from site surveys (geophysical and geotechnical surveys) are summarised in Table 6.23. The largest cumulative PTS-onset range is 71 m for SBP surveys, while the largest cumulative TTS-onset range is 255 m. Other survey activities have smaller ranges (Table 6.23; Seiche Ltd., 2022).

Table 6.23: Predicted maximum impact ranges for harbour seals from proposed site surveys (Seiche Ltd., 2022)

Survey category	Equipment type	Noise type	Effect	PTS Maximum predicted range (m)	TTS Maximum predicted range (m)
Geophysical	MBES	Non-impulsive	Cumulative	2	22
Geophysical	SSS	Non-impulsive	Cumulative	23	26
Geophysical	SBP	Non-impulsive	Cumulative	71	255
Geophysical	USBL positioning equipment	Non-impulsive	Cumulative	0[1]	50[2]
Geophysical	Seismic refraction	Impulsive	Instantaneous	3	6
			Cumulative	2	29
Geophysical	Sparker (2DUHRS and 3DUHRS)	Impulsive	Instantaneous	N/A[3]	3
			Cumulative	1	10
Geotechnical	Seismic CPT	Impulsive	Instantaneous	N/E	4
			Cumulative	3	45
Geotechnical	Vibrocore	Non-impulsive	Cumulative	N/E	4

[1]USBL was not included in the Subsea Noise Assessment (Seiche Ltd., 2022) however, CSA Ocean Sciences Inc. (2020) estimated that the maximum distance to the weighted Level A threshold (cumulative PTS) is 0 m for PW (harbour seals).

[2]Based on maximum distance to all FHG Level B threshold (SPL_{rms}; CSA Ocen Sciences Inc., 2020).

[3]Instaneous PTS thresholds are not exceeded for any FHG for the sparker surveys.

~~6.4.2.23 **Based on the increased risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**~~

6.4.4.54 The nearest boundary of the Slaney River Valley SAC is approximately 47.55 km from the Proposed Development, which is substantially greater than the maximum predicted PTS- or TTS-onset ranges for all survey activities (Table 6.17). As such, no harbour seals within the SAC are predicted to experience auditory injury (PTS) or TTS as a result of the site surveys.

6.4.4.55 The implementation of mitigation measures (Table 6.7), including a project-specific MMMP (NIS Volume III, Appendix 25.2: Marine Mammal Mitigation Plan (Revised March 2026)) during site surveys and adherence to DAHG (2014) guidance, is designed to address exposure under the most precautionary scenario for harbour porpoise, the most noise-sensitive species. As harbour seals have a lower sensitivity to underwater noise compared to harbour porpoise, these measures provide a precautionary buffer, and the actual likelihood and spatial extent of PTS-onset (and by design TTS and behavioural disturbance) for harbour seals will be further reduced.

6.4.4.56 Predicted behavioural disturbance ranges are greater than PTS/TTS distances, with maximum distances of up to 4.95 km for non-impulsive geophysical survey sound sources (SBP), 700 m for sparker, 1.32 km for seismic refraction, 10 km for vibrocore and 1.5 km for seismic CPT for all marine mammal FHGs (Seiche Ltd., 2022). USBL were not included in the Subsea Noise Assessment (Seiche Ltd., 2022) however, CSA Ocean Sciences Inc. (2020) estimated that

the maximum distance to the Level B threshold (disturbance) is 50 m for all marine mammal hearing groups.

6.4.4.57 While some predicted disturbance ranges extend beyond the Proposed Development boundary, the closest distance to the Slaney River Valley SAC (47.55 km away) remains greater than the predicted disturbance ranges, and any behavioural responses are expected to be short-term and reversible in nature.

6.4.4.58 In relation to the Slaney River Valley SAC site-specific COs (Table 5.1), site survey activities are temporary, intermittent and spatially limited, and are not expected to result in sustained displacement, or permanent habitat exclusion from the site. Any behavioural responses would be brief and limited to very few individuals outside of the SAC, without causing significant effects on individual fitness or population integrity. Furthermore, breeding, moulting, and resting haul-out targets are not relevant for this impact because these activities occur outside the SAC and individuals within the SAC would not be affected by survey noise.

6.4.4.59 **With consideration of the limited spatial extent of predicted impact ranges, the absence of overlap with the SAC (with the greatest predicted impact range of up to 10 km), and the implementation of mitigation measures, it is therefore concluded there will be no AEoI of the harbour seal QI of the Slaney River Valley SAC, as defined by its COs, as a result of auditory injury and disturbance due to underwater noise associated with site surveys associated with the construction phase for Project Designs Option 1 and 2.**

OPERATIONAL AND MAINTENANCE PHASE ASSESSMENT

~~6.4.2.24 There are no piling activities or UXO clearance activities proposed for the Operational and Maintenance phase of the Proposed Development. Any underwater noise produced will be due to vessel movements which is assessed in Section 0 to 0.~~

~~6.4.2.25 **There is no potential for AEoI from underwater noise in the operational and maintenance phase of the Proposed Development on this site SAC, as defined by the COs of the site, and feature in both Project Design Option 1 and 2.**~~

6.4.4.60 Routine geophysical surveys of inter-array, inter-connector, and export cables will occur every six months during the first two years and annually thereafter throughout the operational and maintenance phase of the Proposed Development (Table 6.8).

6.4.4.61 As the exact equipment is not yet confirmed, an assessment has been undertaken assuming the same survey equipment and source levels types as that proposed during the pre-construction surveys (Table 6.15 and Table 6.16). Therefore, the impact ranges of auditory injury (PTS), TTS and behavioural disturbance from site surveys during the operational and maintenance phase are expected to be similar to the results of the Subsea Noise Assessment (Seiche Ltd., 2022; CSA Ocean Sciences Inc, 2020) conducted for site surveys during the pre-construction phase.

6.4.4.62 **With consideration of the limited spatial extent of predicted impact ranges, the absence of overlap with Slaney River Valley SAC (with the greatest predicted impact range of up to 10 km), and the implementation of mitigation measures, it is therefore concluded there will be no AEoI of the harbour seal QI of the Slaney River Valley SAC, as defined by its COs, from underwater noise arising from site surveys associated with the operational and maintenance phase for Project Design Options 1 and 2.**

CONSTRUCTION PHASE ASSESSMENT

6.4.4.63 The Underwater Noise Assessment (NIS Volume III, Appendix 11.1: Underwater Noise Assessment (Revised March 2026)) concluded that for non-impulsive construction activities, including dredging and trenching, cumulative PTS could only occur at very short distances from the sound source. For trenching, backhoe dredging and suction dredging, predicted cumulative PTS- and TTS-onset ranges for harbour seal (PCW FHG; Southall *et al.*, 2019) are less than <50 m.

6.4.4.64 Dredging and trenching activities produce continuous, non-impulsive underwater noise and are not expected to result In auditory injury (PTS) in marine mammals. The dominant energy from these activities typically occurs below 1 kHz (Todd *et al.*, 2015), which lies outside the peak hearing sensitivity range of harbour seals (PCW; Southall *et al.*, 2019). As a result, the potential for PTS (or TTS) to occur from these construction activities is expected to have little relevance to individual fitness, survival or reproductive success, as the hearing sensitivity of these receptors is relatively poor below 1 kHz (Southall *et al.,* 2019).

6.4.4.65 Although PTS is a permanent effect, the very limited spatial extent of predicted PTS-onset ranges, combined with the low sensitivity of harbour seals to low-frequency noise, indicates that dredging and trenching will not result in auditory injury (PTS) at levels that would affect population-level parameters.

6.4.4.66 Information on marine mammal sensitivity to dredging and trenching noise is limited, with available studies focusing primarily on the impact of behavioural disturbance from dredging. These studies have confirmed that dredging activities can result in short-term displacement and avoidance behaviour in marine mammals (e.g. Culloch *et al.*, 2016; Pirotta *et al.*, 2013). However, it is often difficult to distinguish the effects of underwater noise from disturbance associated with vessel presence required to undertake the activity (Todd *et al.*, 2015).

6.4.4.67 There are currently no empirical data describing harbour seal responses specifically to dredging or trenching activities. In the absence of such data, it is assumed that behavioural responses and deterrence distances would be similar to those associated with dredging for harbour porpoise, and therefore limited to within 5 km, which is considered a precautionary upper bound for behavioural disturbance (McQueen *et al.*, 2020). Should behavioural disturbance occur, it is expected to be short-term and reversible, with animals returning to the area following cessation of activities.

6.4.4.68 The closest distance between dredging and trenching activities and the boundary of the Slaney River Valley SAC is approximately 47.55 km. This distance substantially exceeds the maximum predicted ranges for PTS-onset, TTS-onset and behavioural disturbance associated with dredging and trenching.

6.4.4.69 In relation to the site-specific COs for Slaney River Valley SAC (Table 5.1), dredging and trenching during construction will not result in permanent or long-term restriction of access to suitable habitat within the SAC, nor introduce underwater noise at levels that would adversely affect the harbour seal population through injury or sustained disturbance. Given the location of the activities well beyond the SAC boundary, breeding, moulting and resting haul-out sites within the SAC will not be affected.

6.4.4.70 **With consideration of the very limited spatial extent of predicted auditory injury (PTS-onset) and disturbance ranges associated with dredging and trenching activities, the absence of overlap with the Slaney River Valley SAC (with the greatest predicted disturbance impact range of up to 5 km), and the temporary, localised and reversible nature of any behavioural disturbance, it is therefore concluded there will be no AEoI of the harbour seal QI of the Slaney River Valley SAC, as defined by its COs, as a result**

of underwater noise arising from dredging and trenching activities associated with the construction phase for Project Design Options 1 and 2.

OPERATIONAL AND MAINTENANCE PHASE ASSESSMENT

6.4.4.71 During the operational and maintenance phase, dredging and trenching may be required intermittently for scour protection repair and maintenance of foundations and cables. These activities are expected to be localised, short-term and less frequent than those undertaken during the construction phase.

6.4.4.72 Based on the underwater noise modelling presented in the Underwater Noise Assessment (NIS Volume III, Appendix 11.1: Underwater Noise Assessment (Revised March 2026)), the precited ranges for auditory injury (PTS-onset), TTS-onset and behavioural disturbance during operation and maintenance are expected to be comparable to those assessed for the construction phase, as similar equipment and methods are anticipated to be used.

6.4.4.73 Based on the information within the literature, disturbance from dredging would be limited to a maximum of 5 km impact radius and any animals that are potentially displaced would be expected to return once the dredging works had ceased (McQueen *et al.*, 2020) with the same deterrence range assumed for trenching due to the lack of data available.

6.4.4.74 The closest distance between dredging and trenching activities during the operational and maintenance phase and the boundary of the Slaney River Valley SAC is approximately 47.55 km. This distance substantially exceeds the maximum predicted ranges for auditory injury (PTS), TTS, and behavioural disturbance associated with dredging and trenching activities.

6.4.4.75 In relation to the site-specific COs for Slaney River Valley SAC (Table 5.1), dredging and trenching during the operational and maintenance phase will not result in permanent or long-term restriction of access to suitable habitat within the SAC, nor introduce underwater noise at levels capable of causing injury or sustained disturbance to the harbour seal population. Breeding, moulting and resting haul-out sites within the SAC will not be affected due to the distance of the activities from the site.

6.4.4.76 **With consideration of the limited, infrequent and localised nature of dredging and trenching during the operational and maintenance phase, the very limited spatial extent of predicted auditory injury and disturbance ranges, and the absence of any overlap with the Slaney River Valley SAC, it is therefore concluded there will be no AEoI of the harbour seal QI of the Slaney River Valley SAC, as defined by its COs, as a result of underwater noise arising from dredging and trenching activities associated with the operational and maintenance phase for Project Design Options 1 and 2.**

INJURY AND/ OR DISTURBANCE FROM VESSEL MOVEMENTS

INJURY FROM VESSEL ACTIVITIES

~~6.4.2.26 There will be increased vessel movements compared to baseline levels during all phases of the Proposed Development, which can result injury and/ or mortality from vessel collision, or disturbance though presence and the generation of underwater noise.~~

~~6.4.2.27 The area surrounding the Proposed Development experiences a relatively low level of vessel traffic due to the presence of the shallow Arklow Bank sandbank, with higher traffic in the coastal areas and immediate surrounding waters.~~

~~6.4.2.28 The shipping and navigation baseline study recorded 29 days of vessel traffic data between 7 July and 14 August 2023. There was an average of 36 to 37 unique vessels per day recorded within the shipping and navigation Study Area (which is defined as Array Area and a 10 nm buffer). The busiest day recorded 59 unique vessels within the shipping and navigation Study~~

~~Area. The main vessel types within the shipping and navigation Study Area were cargo vessels (40%), recreational vessels (31%) and fishing vessels (10%).~~

~~6.4.2.29 During construction of the windfarm, a potential source of impact from increased vessel activity is physical trauma from collision with a boat or ship. In general, three consequences of vessel collision are defined: direct (injuries to the animals that are the immediate result of collision), long-term (a decrease in the fitness of the animal over time), and population consequences (Schoeman et al., 2020). With regards to injuries, both fatal and non-fatal injuries between marine mammals and vessels have been documented (Laist et al., 2001; Vanderlaan et al., 2008; Cates et al., 2017). Fatal collisions have been evidenced via carcasses washing up on beaches (Laist et al., 2001; Peltier et al., 2019); carcasses caught on vessel bows (Laist et al., 2001; Peltier et al., 2019); and floating carcasses which have strong evidence of ship strike, such as propeller cuts, significant bruising, oedema, internal bleeding radiating from a specific impact site, fractures and ship paint marks (Jensen and Silber, 2003; Douglas et al., 2008). Fatalities from ship strikes, however, often go unreported (Authier et al., 2014). For non-fatal injuries, evidence of animals which have survived ship strikes with non-fatal injuries from propellers has been widely documented (Wells et al., 2008; Luksenburg, 2014).~~

~~6.4.2.30 Although many species of marine mammals are able to detect and avoid vessels, it is unclear why some individuals do not always move out of the path of an approaching vessel (Schoeman et al., 2020), although it has been suggested that behaviours such as resting, foraging, nursing, and socialising could distract animals from detecting the risk posed by vessels (Dukas, 2002). It is also possible that animals do not hear vessels when they are near the surface. Collisions between cetaceans and vessels, however, are not necessarily lethal on all occasions.~~

~~6.4.2.31 Whilst a broad range of vessel types have been involved in collisions with marine mammals (Laist et al., 2001), vessels travelling at higher speeds pose a higher risk because of the potential for a stronger strike impact (Schoeman et al., 2020). For example, a study by Laist et al. (2001) found that in 89% of collisions in which the whale was killed or seriously injured the vessels were travelling at speeds of 14 kn (7 m/s) or more, and the vessel exceeded a length of 80 m. Therefore, larger vessels travelling at 7 m/s or faster are those most likely to cause death or serious injury to marine mammals (Laist et al., 2001).~~

6.4.4.77 ~~6.4.2.32~~ Harbour seals are relatively small, agile and highly mobile~~,~~ animals and, given observed behavioural responses to anthropogenic noise, are expected to detect vessels in close proximity and ~~largely~~actively avoid collision.

6.4.4.78 Vessel collision risk for seals is ~~not~~less well understood~~,~~ than for cetaceans; however ~~trauma ascribed to collisions with vessels~~, injury attributed to vessel activities has been identified in a small proportion of both ~~live stranded~~live-stranded (Goldstein *et al.*, 1999) and ~~dead stranded~~dead-stranded seals in the USA (Swails, 2005). In these ~~cases, however, less~~studies, fewer than 2% of all ~~dead~~ necropsied seals had vessel collision ~~attributed to~~identified as the cause of death. A study in the Moray Firth, Scotland showed that seals frequently use the same areas as vessels during trips between ~~haul-outs~~haul-out and foraging sites, but ~~that seals tended to remain beyond~~typically remained at distances greater than 20 m from vessels ~~(~~, with only three recorded instances of passes within 20 m over 2,241 seal tracking days ~~of seal activity resulted in passes at less than 20 m)~~ (Onoufriou *et al.*, 2016), suggesting that the ~~possibility of a risk~~likelihood of collision is very low.

~~6.4.2.33 Overall, the assessment concludes that there is a high likelihood that harbour seals will avoid vessels and therefore collision risk is viewed as negligible, although they have a high sensitivity to the impact should it occur.~~

~~6.4.2.34 With regards to vessel disturbance, harbour seals demonstrate sensitivity to disturbance in regions where vessel traffic overlaps with productive coastal waters (Robards et al. 2016). Vessel disturbance may be particularly detrimental to harbour seal if it changes their haul-out~~

~~patterns or reduces the time they are able to spend resting or nursing pups during the breeding season. When disturbed, seals that are hauled-out typically 'flush' (enter) into the water which could be detrimental during pupping season (Johnson and Acevedo-Gutiérrez, 2007). Key haul-outs for harbour seal in proximity to the Proposed Development are at Arklow, co. Wicklow, along the coast of co. Dublin, and around Wexford Harbour (Duck and Morris, 2013; Morris and Duck, 2019). None of these sites fall within the European protected site.~~

~~6.4.2.35 Avoidance behaviour or alert reactions have been reported in harbour seal when vessels approach within 100 m of a haul-out (Richardson et al., 1995). A study in which 37 harbour seals were telemetry tagged on the east coast of Scotland did not show any apparent response of seals at sea to close passing vessels (they neither moved towards nor away from them) (Onoufriou et al., 2016).~~

~~6.4.2.36 Noise levels from introduced vessels will result in an increase in non-impulsive, continuous sounds primarily from propellers, thrusters, and various rotating machinery (e.g., power generation, pumps) in the vicinity of the Proposed Development. The main drivers influencing the magnitude of potential impact with respect to noise disturbance from vessels are vessel type, speed and ambient noise levels (Wilson et al., 2007). Disturbance from vessel noise is likely to occur only when vessel noise associated with the construction of the Proposed Development exceeds the background ambient noise level.~~

~~6.4.2.37 Vessel noise levels are typically in the range of 10 to 100 Hz (although higher frequencies will also be produced) (Erbe et al., 2019) with an estimated source level of 168 SELcum dB re 1 µPa @ 1 m (Root Mean Square (RMS)) for large construction vessels and 161 SELcum dB re 1 µPa @ 1 m (RMS) for medium construction vessels, travelling at a speed of 10 knots. In general, support and supply vessels (50-100 m) are expected to have broadband source levels in the range 165-180 dB re 1µPa, with the majority of energy below 1 kHz (OSPAR, 2009). Large commercial vessels (>100 m) produce relatively loud and predominately low frequency sounds, with the strongest energy concentrated below several hundred Hz (OSPAR, 2009).~~

~~6.4.2.38 Another telemetry study that included the tagging of 28 harbour seals in the UK found high exposure levels of harbour seals to shipping noise, and as a result 20 individuals may have experienced a TTS due to cumulative SELs exceeded the TTS-threshold for pinnipeds exposed to continuous underwater noise (183dB re 1 µPa2s) (Jones et al., 2017). The overlap between seals and vessel activity most frequently occurred within 50 km of the coast and in proximity to seal haul-outs. The study concluded that there was no evidence of reduced harbour seal presence as a result of vessel traffic, despite the spatial overlap and cumulative SELs (Jones et al., 2017).~~

~~6.4.2.39 **Overall, the assessment concludes that although harbour seals demonstrate they are disturbed by vessel movements, evidence supports the assessment that all impacts are temporary and overall do not result in reduced harbour seal presence as a result of the activities. Therefore, there is no AEoI on the Slaney River Valley SAC, as defined by the COs of the site, as a result of injury or disturbance form vessel movement.**~~

CONSTRUCTION AND DECOMMISSIONING PHASE ASSESSMENT

6.4.4.79 ~~6.4.2.40~~ During the construction phase, ~~a maximum of 66~~up to 69 installation vessels ~~will~~may be present within the Proposed Development at any one time, resulting in a maximum of 4,150 vessel return trips over the ~~five-year~~four-year construction period, and a maximum of 1,797 vessel return trips per year. A similar number of vessels are anticipated for the decommissioning phase.

6.4.4.80 ~~6.4.2.41~~ The majority of vessels used during the construction ~~phase~~and decommissioning phases are likely to be large installation vessels that will ~~either be travelling considerably slower than 7 m/s (the key risk is when this speed is exceeded with large vessels) or will be stationary for significant periods of time. Therefore, the actual increase~~operate at relatively

low speeds or remain stationary for extended periods of time. The key collision risk threshold for large vessels is generally associated with speeds exceeding 7 m/s; however, such speeds are not anticipated to be routinely exceeded during construction or decommissioning activities. Consequently, increases in vessel traffic ~~moving~~ within the Proposed Development and ~~to/from port will occur over short~~along transit routes will be intermittent and largely confined to discrete periods of ~~the~~ offshore ~~construction~~ activity.

6.4.4.81 Smaller vessels ~~involved in~~associated with construction and decommissioning activities (i.e. tug/anchor handlers, guard vessels, survey vessels, and crew transfer vessels) are more manoeuvrable than larger installation vessels and are therefore better able to ~~move to~~ avoid marine mammals ~~(~~when detected~~)~~, even when an animal is close and the vessel is going at ~~high speed, due to better manoeuvrability compared to larger vessels~~higher operating speed (Schoeman *et al.*, 2020). In contrast, ~~large~~larger vessels, such as jack-up vessels, have ~~low~~reduced manoeuvrability and may require larger distances to avoid an animal, but travel at slower speeds~~.~~, reducing collision risk.

6.4.4.82 In addition, the ~~factored-in~~mitigation measures (see Table 6.7) which ~~include a EVMP~~includes an Environmental VMP (NIS Volume III, Appendix 25.10: Environmental Vessel Management Plan), will ensure that vessel traffic will move along predictable routes, which is known to be a key aspect in minimising the potential ~~risks~~risk of injury imposed by vessel traffic (Nowacek *et al.*, 2001; Lusseau, 2003; 2006). ~~The EVMP also sets out a Code of Conduct to minimise interactions with marine mammals and define how vessels should behave in the presence of them.~~

6.4.4.83 Noise generated by construction and decommissioning vessels is expected to be detectable by marine mammals and is therefore likely to facilitate avoidance behaviour in harbour seals. Although construction will result in a temporary increase in vessel activity, vessel movements will be largely restricted to the Array Area, Cable Corridor and Working Area, and will generally follow existing shipping routes to and from port. Given the high levels of baseline vessel traffic in the Irish Sea, the introduction of construction and decommissioning vessels is not considered to represent a novel or atypical pressure for harbour seals in the region. Accordingly, vessel activity associated with the Proposed Development is not expected to materially increase the risk of injury from vessel activities.

6.4.4.84 Furthermore, the SAC boundary is located approximately 47.55 km from the Proposed Development. Given this substantial separation distance, the likelihood of overlap between project-specific vessel activity and the SAC is very low. Whilst harbour seals may be present outside the boundary of the SAC and within areas used by vessel traffic; however, the proportion of the population likely to be present within the Project area at any one time is expected to be very small given the distance from key SAC habitats. Therefore, vessel movements associated with the Proposed Development will not result in permanent or long-term restriction of access to suitable habitat within the SAC, as vessel activity is temporary, transitory, and does not constitute a fixed or continuous pressure capable of causing sustained displacement.

6.4.4.85 Overall, there is a high likelihood that harbour seals will avoid vessels, and the probability of injury risk from vessel activities is considered negligible. While the consequence of a vessel injury event could be severe at an individual level, the likelihood of such an event occurring is very low.

6.4.4.86 ~~6.4.2.42 It is also anticipated that noise produced by the vessels will be detectable by the harbour seals and therefore enable avoidance.~~ With consideration of ~~**this and the above assessment it is**~~the mobility of harbour seals, the nature of construction and decommissioning vessel traffic, distance from the SAC (47.55 km) and the implementation of Environmental VMP, vessel movements are not expected to not result in permanent exclusion from suitable habitat, injury or population-level effects**. It is therefore concluded ~~that~~ there ~~is~~will be no ~~potential for~~ AEoI ~~upon the integrity of~~of the harbour seal QI of the Slaney**

River Valley SAC, as defined by ~~the~~its COs ~~of the site~~, as a result of injury from vessel ~~collision impacting harbour seal from design~~activities associated with the construction and decommissioning phases for Project Design ~~Option~~Options 1 and 2.

~~6.4.2.43 Based on the increased risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.~~

OPERARTION AND MAINTENANCE PHASE ASSESSMENT

6.4.4.87 During the operational and maintenance phase, a maximum of 30 vessels will be present within the Proposed Development at any one time, resulting in a maximum of 1,359 vessel return trips per year. Vessels that will be used during the operational and maintenance phase (up to 36.5 years) include crew transfer vessels, jack-up vessels, cable repair vessels.

6.4.4.88 As with construction activities, vessels operating during the operational and maintenance phase are expected to travel at relatively low speeds within the Proposed Development, with larger vessels either stationary or operating at slow speeds during maintenance activities. Smaller, more manoeuvrable vessels (e.g. crew transfer vessels) are able to alter course to avoid marine mammals when detected. Harbour seals are therefore expected to detect and avoid vessels, resulting in a low likelihood of collision.

6.4.4.89 The continued implementation of mitigation measures, including the Environmental VMP (Table 6.7; NIS Volume III, Appendix 25.10: Environmental Vessel Management Plan), will ensure predictable vessel routing and adherence to appropriate vessel management procedures, further reducing collision risk. Given the lower vessel numbers relative to construction, the absence of novel vessel activity, and the high baseline levels of vessel traffic in the Irish Sea, vessel movements during operation and maintenance are not expected to materially increase collision risk for harbour seals.

6.4.4.90 In relation to the site-specific COs for Slaney River Valley SAC (Table 5.1), vessel movements during the operational and maintenance phase will not result in permanent or long-term restriction of access to suitable habitat within the SAC, as vessel activity will be intermittent, transitory, and of lower intensity than during construction.

6.4.4.91 Given the relatively low vessel numbers, the intermittent and localised nature of any operational and maintenance activities, expected slow vessel speeds and continued application of Environmental VMP, vessel movements during operational and maintenance phase will not result in permanent habitat exclusion, injury or population-level effects. **It is therefore concluded there will be no AEoI of the harbour seal QI of the Slaney River Valley SAC, as defined by its COs, as a result of injury from vessel activities associated with the operational and maintenance phase for Project Design Options 1 and 2.**

VESSEL DISTURBANCE

6.4.4.92 With regards to vessel disturbance, harbour seals are known to exhibit sensitivity to disturbance in areas where vessel traffic overlaps with productive coastal waters (Robards *et al.*, 2016). Vessel disturbance may be particularly relevant if it alters haul-out behaviour or reduces time spent resting, moulting, or nursing pups during the breeding season. When disturbed, hauled-out seals typically 'flush' (enter) into the water, which may be energetically costly, particularly during the pupping season (Johnson and Acevedo-Gutiérrez, 2007).

6.4.4.93 Noise generated by vessels associated with the Proposed Development will primarily comprise non-impulsive, continuous underwater noise from propellers, thrusters, and various rotating machinery (e.g., power generation, pumps). The main drivers influencing the potential impact with respect to noise disturbance from vessels are vessel type, speed and prevailing ambient noise levels (Wilson *et al.*, 2007). Disturbance is therefore most likely to occur where vessel noise exceeds background ambient noise levels.

6.4.4.94 During the construction phase, up to 69 installation vessels may be present within the Proposed Development at any one time, resulting in a maximum of 4,150 vessel return trips over the four-year construction period, and a maximum of 1,797 vessel return trips per year. A similar number of vessels are anticipated for the decommissioning phase.

6.4.4.95 ~~6.4.2.44~~ With consideration of disturbance and displacement, the coastal areas and immediate surrounding waters of the Proposed Development are already subject to high levels of vessel traffic (see EIAR Volume II, Chapter 15: Shipping and Navigation (Revised March 2026)). With consideration of this, ~~it is concluded that it is unlikely there will be a~~the introduction of construction and decommissioning vessels is not considered to represent a novel or significant change in the level of disturbance ~~harbour seals naturally present are subject to. The EVMP will serve to ensure that vessels follow predictable routes in addition to setting out how vessels should behave in the presence of the species. It is concluded that any disturbance above the current baseline levels of activity will only result in a short-term and temporary impact on behaviour, and the above assessments of the impact of underwater noise support the assessment~~ that harbour seals ~~typically return to similar abundance as before within 2 hours of cessation of the activities causing disturbance~~are currently subject to.

6.4.4.96 Avoidance behaviour or alert reactions have been observed in harbour seal when vessels approach within approximately 100 m of haul-out sites (Richardson *et al.*, 1995). A study in which 37 harbour seals were telemetry tagged on the east coast of Scotland, did not show any apparent behavioural response of seals at sea to close passing vessels, with seals neither consistently approaching nor avoiding vessels (Onoufriou *et al.*, 2016). Given the distance between the Proposed Development and the haul-outs within the SAC (>47.55 km), it is considered highly unlikely that vessel traffic associated with the Proposed Development would pass the haul-outs close enough to lead to a disturbance or flushing response.

6.4.4.97 A further telemetry study involving 28 harbour seals in UK waters identified frequent spatial overlap between seals and vessel traffic, with some individuals potentially experiencing TTS based on cumulative sound SEL exceeding the continuous TTS-onset threshold for pinnipeds (183 dB re 1 μPa^2s; Jones *et al.*, 2017). However, the study found no evidence of reduced seal presence or long-term displacement in response to vessel activity, despite repeated exposure and spatial overlap, most frequently within 50 km of the coast and in proximity to haul-out sites (Jones *et al.*, 2017).

6.4.4.98 Mitigation measures, including implementation of the Environmental VMP (NIS Volume III, Appendix 25.10: Environmental Vessel Management Plan), will ensure that vessels operate along predictable routes and at controlled speeds (Table 6.7). Predictable vessel movements and reduced speeds are recognised as key factors in minimising disturbance to marine mammals. Vessel simulation modelling indicates that reducing vessels speeds by 20-50% can reduce source noise by approximately 5 - 18 dB and reduce the number of animals exposed, thereby decreasing the likelihood and severity of disturbance (Findlay *et al.*, 2023).

6.4.4.99 ~~6.4.2.45 **Therefore, it is**~~With consideration of the temporary and reversible nature of vessel-related behavioural responses, the existing high baseline of vessel activity, the absence of evidence for population-level effects, and the implementation of Environmental VMP to reduce risk, vessels movements during the construction and decommissioning phase are not expected to result in long-term displacement, sustained disturbance, or interference with key life-history behaviours of harbour seals associated with the SAC**. It is therefore concluded that there will be no AEoI ~~upon the integrity of~~of the harbour seal QI of the Slaney River Valley SAC, as defined by ~~the~~its COs ~~of the site~~, as a result of disturbance from vessel ~~movement impacting harbour seal from Project Design Option 1.~~**

~~6.4.2.46~~ **activities associated with ~~Based on the increased risk of effect of~~the construction and decommissioning phase for Project Design ~~Option~~Options 1~~, it is concluded that no AEoI would also apply to Project Design Option~~ and 2.**

OPERATIONAL AND MAINTENANCE PHASE ASSESSMENT

6.4.4.100 ~~6.4.2.47~~ During the operational and maintenance phase, a maximum of ~~22~~30 vessels will be present within the ~~Array Area~~Proposed Development at any one time, resulting in a maximum of ~~1,294~~1,359 vessel return trips per year. ~~With consideration that this is a significant reduction in the number of vessels present in comparison to the construction and decommissioning phase it is concluded that based on the assessment for that phase, there is no potential for significant effect.~~

6.4.4.101 Vessel activity during the operational and maintenance phase represents a reduction in both vessel numbers and intensity compared to the construction and decommissioning phases. As during construction, vessel movements will be subject to the Environmental VMP (NIS Volume III, Appendix 25.10: Environmental Vessel Management Plan; Table 6.7), ensuring predictable routing, controlled speeds and adherence to mitigation measures designed to minimise disturbance to marine mammals.

6.4.4.102 ~~6.4.2.48 **Therefore, no AEoI upon the integrity of**~~ In relation to the site-specific COs for Slaney River Valley SAC (Table 5.1), any behavioural responses remain temporary and localised, with animals expected to return following any displacement, long-term displacement or interference with key life-history behaviours of harbour seals associated with the site not being expected**. It is therefore concluded that there will be no AEoI of the harbour seal QI of the Slaney River Valley SAC, as defined by ~~the~~its COs ~~of the site~~, as a result of disturbance ~~or collision risk~~ from vessel ~~movement impacting harbour seal from~~activities associated with the operational and maintenance phase for Project Design ~~Option~~Options 1 ~~in this phase~~and 2.**

~~6.4.2.49 **Based on the increased risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**~~

CHANGES IN FISH AND SHELLFISH COMMUNITY AFFECTING PREY RESOURCES

6.4.4.103 Potential impacts to prey resources arising from the Proposed Development are expected to be largely restricted to the boundaries of the Proposed Development due to the localised footprint of seabed disturbance, the temporary nature of construction activities, and the limited spatial extent of predicted underwater noise and sediment dispersion effects. As such, any indirect effects on harbour seals via changes in prey availability would be limited to individuals foraging within, or close proximity to the Proposed Development.

6.4.4.104 ~~6.4.2.50~~ Harbour ~~seal are primarily dependent on~~seals feed on a wide range of fish and invertebrate species, including sandeel (*Ammodytes* spp.), sole (*Solea* spp.), poor cod, dragonet (*Callionymidae*), whiting, rockling (*Gaidropsarus mediterraneus*), Atlantic horse mackerel (*Trachurus trachurus*), crustaceans~~,~~ (*Crustacea*), pelagic squid ~~species~~(*Loligo* spp.), and octopus ~~species~~(*Octopus* spp.) for food (Kavangah *et al.*, 2010). This broad dietary composition demonstrates a ~~highly varied diet and~~generalist food strategy and an ability to adapt to localised or temporary changes in availability of prey types ~~where needed and so we view~~. On this basis, harbour seals ~~as generalist feeders. It is concluded that they~~are considered to have a low sensitivity to changes in prey resources.

CONSTRUCTION AND DECOMMISSIONING PHASE ASSESSMENT

6.4.4.105 Harbour seal have a generalist diet, similar to other Annex II marine mammal species including harbour porpoise. The assessment of the impact from changes in prey to the harbour porpoise QI of Blackwater Bank SAC has been considered at a high-level across changes to the prey community, rather than reflecting species-specific prey preferences. It is also highlighted that the diet of harbour porpoise (predominantly whiting, Atlantic herring, and poor cod) has overlap with that of harbour seal. Accordingly, the assessment of changes in the fish and shellfish

community affecting prey resources for the Blackwater Bank SAC are considered applicable to SACs for harbour seal, including Slaney River Valley SAC.

6.4.4.106 ~~6.4.2.51 Impacts to prey resources will be largely restricted to the boundaries of the Proposed Development and, therefore, harbour seal occurring within this area also have the potential to be impacted. The impacts on prey species are not qualifying interest species specific, with prey species for harbour seal subject to the same impacts as the prey species as the other Annex 2 marine mammal species considered within this assessment (bottlenose dolphin,~~This approach has been undertaken as there is significant overlap between potential impacts on the community of prey species associated with construction and decommissioning activities that have been comprehensively assessed for harbour porpoise ~~and harbour seal). A full assessment on the impacts of the Proposed Development on prey species has been considered within the assessment on~~within Blackwater Bank SAC (Section 6.4.1) ~~which~~. Blackwater Bank SAC is located ~~19.76~~approximately 19.13 km from the Proposed Development, ~~significantly~~substantially closer than the Slaney River Valley SAC (~~44.54 km)~~approximately 47.55 km), and that assessment is therefore considered precautionary when applied to the harbour seal QI associated with Slaney River Valley SAC.

~~6.4.2.52 **Therefore, it is concluded that there is no AEoI upon the integrity of Slaney River Valley SAC, as defined by the COs of the site, from changes in prey impacting harbour seal from Project Design Option 1 in this phase.**~~

6.4.4.107 As detailed in Section 6.4.1 and EIAR Volume II, Chapter 10: Fish, Shellfish and Sea Turtle Ecology (Revised March 2026), potential effects on prey species include temporary habitat disturbance, increased SSC and associated deposition, injury and/or disturbance as a result of underwater noise and vibration, and accidental pollution. These effects are predicted to be highly localised, temporary and recoverable, affecting only a very small proportion of available prey habitat.

6.4.4.108 Harbour seals are considered to be opportunistic predators with a broad and flexible diet and are therefore considered to have a low sensitivity to localised or short-term changes in prey availability. The scale and duration of predicted prey impacts are not expected to result in any meaningful reduction in prey availability or accessibility at a scale relevant to the harbour seal population associated with Slaney River Valley SAC.

6.4.4.109 **With consideration of the highly localised and temporary nature of the impacts described above, the implementation of mitigation measures and resulting limited spatial extent of potential effects on prey species, and the generalist foraging strategy of harbour seals, it is therefore concluded there will be no AEoI of the harbour seal QI of the Slaney River Valley SAC, as defined by its COs of the site, as a result of changes in prey resources associated with the construction and decommissioning phases for Project Design Option 1.**

6.4.4.110 **Based on the representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

OPERATIONAL AND MAINTENANCE PHASE ASSESSMENT

6.4.4.111 During the operational and maintenance phase, potential effects on prey species would be limited to intermittent and localised activities such as maintenance dredging or trenching associated with cable or foundation repair. These activities would be infrequent, short-term and spatially restricted when compared to construction and decommissioning works.

6.4.4.112 Any potential effects on prey species during operation and maintenance would be of the same nature as those assessed for the construction phase (including temporary habitat disturbance, localised increases in SSC and accidental pollution), but would occur at a reduced intensity, extent and frequency.

6.4.4.113 As detailed within the construction phase assessment for Blackwater Bank SAC (Section 6.4.1), predicted impacts on prey species are highly localised, temporary and recoverable, and affect only a very small proportion of available foraging habitat. Given the generalist foraging strategy of harbour seals, any short-term or localised changes in prey availability during operation and maintenance would not meaningfully affect foraging success or energetic balance.

6.4.4.114 **With consideration that of the limited spatial extent of any prey-related effects during operation and maintenance and the distance of the Proposed Development to the SAC (47.55 km), no interaction with prey resources supporting the harbour seal population associated with the SAC is predicted. It is therefore concluded there will be no AEoI of the harbour seal QI of the Slaney River Valley SAC, as defined by its COs, as a result of changes in prey resources associated with the operational and maintenance phase for Project Design Option 1.**

6.4.4.115 ~~6.4.2.53~~ **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it ~~can be reasonably assumed that the same conclusion of~~is concluded that no AEoI would also apply to Project Design Option 2.**

ACCIDENTAL POLLUTION

6.4.4.116 ~~6.4.2.54~~ There is ~~the~~ potential for ~~an~~ accidental release of pollutants ~~to occur~~ from vessels and equipment associated with the construction, operational and maintenance, and decommissioning phases of the Proposed Development~~, which may result in adverse effects on marine mammals~~. Pollutants may include diesel fuel, bentonite (from drilling activities), lubricants, grease and oils, anti-fouling biocides, and grout.

6.4.4.117 ~~6.4.2.55~~ In the event of an accidental spill, ~~given the density and distribution of marine mammals in the Marine Mammal Study Area, it is possible that individuals could come into contact with~~harbour seals could be exposed to contaminants~~.~~

~~6.4.2.56~~ through either direct or indirect pathways. ~~Direct impacts include ingestion, inhalation, and absorption. All of which may result in physiological responses with health and long-term survival and/or reproduction consequences, the most serious of which could be damage to the respiratory system (Helm *et al.*, 2015).~~

~~6.4.2.57 Indirect impacts include short- and long-term reductions in food availability, disruption to social bonds, reduced reproduction, and/or cumulative effects on individuals, populations, and the ecosystem (Helm *et al.*, 2015).~~

~~6.4.2.58~~ Harbour seals are reliant on terrestrial haul-out sites for resting, moulting, and breeding which makes them particularly vulnerable to the effects of pollution. Seals have been shown to develop conjunctivitis, corneal abrasion, and swollen eyelid membranes in response to exposure to crude oil (Geraci and St. Aubin, 1980). While external oiling is not expected to significantly impact the ability of adult seals to maintain their core body temperature as they rely on blubber for insulation, seal pups entering the water could be vulnerable as oil residues can reduce the thermal properties of neonate animals, increasing their susceptibility to hypothermia (Helm *et al.*, 2015)~~.~~.

~~6.4.2.59 Overall, accidental pollution has the potential to cause LSE on harbour seal features.~~

CONSTRUCTION AND DECOMMISSIONING PHASE ASSESSMENT

6.4.4.118 ~~6.4.2.60~~ The installation and removal of ~~the~~ offshore infrastructure for the Proposed Development may lead to the accidental release of pollutants through spills and leaks from vessels and equipment~~. The project design parameters for Project Design Option 1 during the construction phase are outlined in~~ Table 6.8 ~~and include the installation of 56 WTGs, two OSPs, between 110 and 122 km of inter-array cables, between 25 and 28 km of interconnector~~

~~cables, and between 35 and 40 km offshore export cables. There will also be up to 4,150 vessel round trips and 294 helicopter round trips during the construction phase (including activities at the landfall site~~ (Table 6.8).

~~6.4.2.61 The~~ Potential ~~impact to marine mammals from accidental pollution~~impacts during the decommissioning phase ~~is~~are expected to be ~~the same~~similar to, or less than, those during the construction phase.

6.4.4.119 ~~6.4.2.62~~ The magnitude of ~~the impact of~~any accidental pollution ~~will be dependent on the quantities of potential pollutants carried by construction vessels and within equipment.~~event would depend on the type and quantity of material released, with the release of ~~a large inventory of~~ fuel ~~oil~~ from a construction vessel ~~is, however,~~ considered to represent the ~~greatest potential accidental pollution event~~largest credible spill scenario from installation activities. In the event of an accidental spill from vessels, equipment or from construction activities, ~~the spill~~pollutants would be subject to immediate dilution and rapid ~~dispersal~~dispersion within the marine environment (Marappan *et al.,* 2022).

~~6.4.2.63 Considering avoidance through design and management (see~~ Table 6.7~~), the likelihood of accidental release is considered extremely low. The measures in the EMP include storage of chemicals in secure designated areas on vessels in line with appropriate regulations and guidelines, and double skinning of any tanks and pipes containing hazardous substances. All chemicals used will be subject to a chemical risk assessment to ensure risks are understood and minimised. The EMP also includes a MPCP which will contain key emergency contact details and response procedures in the event of a spill of any magnitude to ensure minimal impact. Complying with these procedures will also reduce the magnitude of any spill. Adherence to the avoidance design and management measures outlined in~~ Table 6.7~~, including the EMP and MPCP will significantly reduce the likelihood of an accidental pollution incident occurring, and the magnitude of its impact.~~

6.4.4.120 The likelihood of accidental pollution is considered extremely low due to avoidance through design and management measures (Table 6.7). These include the secure storage and handling of chemicals and hazardous material, double-skinned tanks and pipework where appropriate, chemical risk assessments, and the implementation of an EMP (NIS Volume III, Appendix 25.1: Environmental Management Plan) and MPCP. The MPCP sets out emergency response procedures to minimise the scale and duration of any spill should one occur.

6.4.4.121 ~~6.4.2.64~~ **Given the inherent low likelihood of an accidental pollution event from vessel activity and ~~other activities, as well as the proposed avoidance/ impacts reduction~~equipment used during construction and decommissioning, the highly localised nature of any potential exposure, and the mitigation measures (as set out in Table 6.7), it is therefore concluded there ~~is~~will be no ~~potential for~~ AEoI ~~from accidental pollution on~~of the harbour seal QI of the Slaney River Valley SAC, as defined by ~~the~~its COs ~~of the site, impacting harbour seal from~~, as a result of accidental pollution associated with the construction and decommissioning phase for Project Design Option 1.**

6.4.4.122 ~~6.4.2.65~~ **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

OPERATIONAL AND MAINTENANCE PHASE ASSESSMENT

~~6.4.2.66 There is the potential for the accidental release of pollutants during this phase of the Proposed Development as a result of the presence of offshore infrastructure, associated equipment, and vessel movements. The project design parameters for Project Design Option 1 during the operational and maintenance phase are outlined in~~ Table 6.8~~. This includes synthetic compound, for example from antifouling biocides, heavy metal, and hydrocarbon contamination as a result of the presence of 56 WTGs and two OSPs as well as from~~

~~maintenance activities. There will also be up to 1,294 vessel round trips and 485 helicopter round trips per year during this phase of the proposed development.~~

~~6.4.2.67 The assessment for this phase is the same as for the construction phase, with the same avoidance by design and management measures being implemented to reduce the risk to negligible levels (see Table 6.7 and Section 0). **It is concluded that the potential for AEoI upon the integrity of Slaney River Valley SAC, as defined by the COs of the site, from accidental pollution impacting harbour seal from Project Design Option 1 is entirely negligible.**~~

6.4.4.123 During the operational and maintenance phase, there remains a potential for accidental release of pollutants as a result of the presence of offshore infrastructure, associated equipment, and vessel movements (Table 6.8).

6.4.4.124 The pathways, likelihood and consequences of accidental pollution during this phase are consistent with those assessed for the construction phase. The same avoidance through design and management measures, including the EMP and MPCP (Table 6.7), will be implemented throughout operation and maintenance.

6.4.4.125 **On this basis, it is concluded that there will be no AEoI of the harbour seal QI of the Slaney River Valley SAC, as defined by its COs, as a result of accidental pollution associated with the operational and maintenance phase for Project Design Option 1.**

6.4.4.126 **Based on the representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

6.4.5 Carnsore Point SAC

Harbour porpoise

6.4.5.1 The relevant Annex II marine mammal QI site-specific COs at Carnsore Point SAC is to maintain the favourable conservation condition of the harbour porpoise QI, as defined by the list of attributes and targets set out in Table 5.1 (NPWS, 2024c).

6.4.5.2 Eight potential impacts pathways relevant to harbour porpoise have been identified in relation to the construction, operation and maintenance, and decommissioning of the Proposed Development (Table 6.8). These pathways have been assessed in detail for Blackwater Bank SAC which is also designated for the same Annex II marine mammal QI and is located approximately 19.13 km from the Proposed Development, compared to approximately 50.08 km for Carnsore Point SAC.

6.4.5.3 As the severity and likelihood of all relevant impact pathways are intrinsically distance-dependent, Blackwater Bank SAC represents the closest designated site for harbour porpoise from the Proposed Development. The assessment presented in Section 6.4.1 therefore provides a conservative basis for evaluation and concluded that none of the identified impact pathways would result in an AEoI of Blackwater Bank SAC, with respect to the harbour porpoise QI.

6.4.5.4 Given that the Carnsore Point SAC supports the same Annex II marine mammal QI and lies substantially further from the Proposed Development, the magnitude of effects at Carnsore Point SAC is concluded to be no greater than, and in practice less than, those associated for Blackwater Bank SAC. **It is therefore concluded that there will be no AEoI of the harbour porpoise QI of the Carnsore Point SAC, as defined by its COs, as a result of any of the impacts considered for Project Design Option 1 across any phase.**

6.4.5.5 ~~6.4.2.68~~ **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

6.4.6 ~~6.4.3~~ Lambay Island SAC

Grey seal

~~6.4.3.1 The conservation objectives for grey seal at this designated site is to maintain the favourable conservation condition of the feature, how this is defined is presented in Table 5.1.~~

6.4.6.1 The relevant Annex II marine mammal QI site-specific COs at Lambay Island SAC is to maintain the favourable conservation condition of the grey seal, as defined by the following list of attributes and targets (NPWS, 2013b):

- *Access to suitable habitat*: Species range within the site should not be restricted by artificial barriers to site use;
  - This target may be considered relevant to proposed activities or operations that will result in the permanent exclusion of grey seal from part of its range within the site, or will permanently prevent access for the species to suitable habitat therein; and
  - It does not refer to short-term or temporary restriction of access or range.
- *Breeding behaviour:* The breeding sites should be maintained in a natural condition;
  - This target is relevant to proposed activities or operations that will result in significant interference with or disturbance of (a) breeding behaviour by grey seal within the site and/or (b) aquatic/terrestrial/intertidal habitat used during the annual breeding season.
  - Operations or activities that cause displacement of individuals from a breeding site or alteration of natural breeding behaviour, and that may result in higher mortality or reduced reproductive success, would be regarded as significant and should therefore be avoided.
- *Moulting behaviour:* The moult haul-out sites should be maintained in a natural condition;
  - This target is relevant to proposed activities or operations that will result in significant interference with or disturbance of (a) moulting behaviour by grey seal within the site and/or (b) aquatic/terrestrial/intertidal habitat used during the annual moult.
  - Operations or activities that cause displacement of individuals from a moult haul-out site or alteration of natural moulting behaviour to an extent that may ultimately interfere with key ecological functions would be regarded as significant and should therefore be avoided.
- *Resting behaviour*: The resting haul-out sites should be maintained in a natural condition;
  - This target is to proposed activities or operations that will result in significant interference with or disturbance of (a) resting behaviour by grey seal within the site and/or (b) aquatic/terrestrial/intertidal habitat used for resting.
  - Operations or activities that cause displacement of individuals from a resting haul-out site to an extent that may ultimately interfere with key ecological functions would be regarded as significant and should therefore be avoided.
- *Disturbance:* Human activities should occur at levels that do not adversely affect the grey seal population at the site:
  - Proposed activities or operations should not introduce man-made energy (e.g. aerial or underwater noise, light or thermal energy) at levels that could result in a significant negative impact on individuals and/or the population of grey seal within the site. This refers to the aquatic habitats used by the species in addition to important natural behaviours during the species' annual cycle;
  - This target also relates to proposed activities or operations that may result in the deterioration of key resources (e.g. water quality, feeding, etc.) upon which grey

seals depend. In the absence of complete knowledge on the species ecological requirements at this site, such considerations should be assessed where appropriate on a case-by-case basis.

6.4.6.2 ~~6.4.3.2~~ There are ~~four key~~seven potential ~~impacts on~~impact pathways relevant to grey seal associated with the construction, operational and maintenance, and decommissioning of the Proposed Development, which are ~~presented~~identified in Table 6.8 and are assessed below for each phase of the Proposed Development.

INJURY AND/ OR DISTURBANCE FROM UNDERWATER NOISE FROM PILING

6.4.6.3 ~~6.4.3.3 Underwater noise has the potential to impact marine mammals if the frequency is within their hearing range, and in particular if the sound levels are greater than the relevant thresholds.~~ With consideration of grey seals, they are within the ~~Phocid (in water,~~ same FHG as harbour seals (PCW) ~~hearing group~~ with a hearing range of 50 Hz to 86 kHz~~. The impacts can range from~~ (Southall *et al.*, 2019). Underwater noise-generating activities associated with the Proposed Development therefore have the potential to result in auditory injury, behavioural disturbance ~~and~~or temporary displacement, ~~to changes in behaviour including masking depending on the severity of the underwater noise. The sources of underwater noise within this assessment are piling, UXO clearance, and pre-construction geophysical surveys.~~depending on noise level, duration and proximity.

~~6.4.3.4 Exposure to loud underwater noises can lead to a reduction in hearing sensitivity which may be temporary (TTS) or permanent (PTS). PTS is defined by Southall *et al.* (2007) as a non-recoverable elevation of the hearing threshold of 6 dB. It has been assumed that PTS-onset occurs after TTS has grown to 40 dB, based on TTS growth rates obtained from scientific literature.~~

6.4.6.4 For each mitigated piling scenario (see Section 6.4.1.12), predicted impacts to grey seals were informed by a single modelled average at-sea density estimate across the Array Area and Cable Corridor and Working Area (0.08 animals/km^2; Table 6.6) and using the thresholds for impulsive noise outlined in Table 6.9. Full details of the underwater noise modelling methodology and the resulting impact areas and ranges are detailed in the Underwater Noise Assessment (NIS Volume III, Appendix 11.1: Underwater Noise Assessment (Revised March 2026)).

CONSTRUCTION PHASE ASSESSMENT

AUDITORY INJURY (PTS)

6.4.6.5 Predicted impact areas and maximum ranges for auditory injury (PTS-onset) to grey seals from pile driving during construction from the Proposed Development, across both mitigated piling scenarios (ramp-up mitigation scenario and extended ramp-up mitigation scenario), are presented in Table 6.19: Predicted impact range of PTS-onset from pile driving at the SW WTG array location with harbour seal density estimates. For further information on densities used; see

6.4.6.6 For the ramp-up mitigation scenario, the maximum instantaneous PTS-onset impact range was 60 m for the installation of a 11 m monopile at the N WTG location, which represents the piling location closest to Lambay Island SAC (Table 6.24). This equates to a maximum of one individual potentially experiencing auditory injury, representing <0.01% of the reference population of 1,662 within the East region of RoI (Morris and Duck, 2019).

6.4.6.7 Using the cumulative PTS-onset thresholds, the maximum impact range at all piling locations was predicted to be <50 m, equating to a maximum of one individual (<0.01% of the reference population; Table 6.24).

6.4.6.8 With the implementation of the extended ramp-up mitigation scenario, the maximum instantaneous PTS-onset impact range remained at 60 m at the N WTG location, corresponding to a maximum of one individual (<0.01% of the reference population; Table 6.24). Predicted cumulative PTS-onset impact ranges also remained at <50 m at all piling locations, equating to a maximum of one individual experiencing auditory injury (<0.01% of the reference population; Table 6.24).

6.4.6.9 Overall, predicted auditory injury to grey seals from pile driving during construction is extremely limited in spatial extent and scale, with the N WTG location representing the most precautionary scenario and most relevant piling location in relation to Lambay Island SAC.

Table 6.24: Predicted impact range of PTS-onset from pile driving at N WTG array location with grey seal densities estimates. For further information on densities used; see Table 6.6.

Piling Scenario	Piling location and Monopile diameter (m)		Density (animals/km²)	Area (km²)	Maximum range (m)	Number of animals[1,2]	Percentage of reference population[2] (%)
Instantaneous PTS-onset (unweighted SPL_{peak})							
Ramp-up mitigation scenario	N WTG	11 m	0.08	<0.01	60	<1	<0.01
Extended ramp-up mitigation scenario	N WTG	11 m	0.08	0.01	60	<1	<0.01
Cumulative PTS-onset (weighted SEL_{cum})							
Ramp-up mitigation scenario	N WTG	11 m	0.08	<0.01	<50	<1	<0.01
Extended ramp-up mitigation scenario	N WTG	11 m	0.08	<0.01	<50	<1	<0.01

[1]*The predicted number of individuals exposed to PTS-onset (both instantaneous and cumulative) from pile driving is fewer than one animal across all density scenarios. Importantly, the maximum PTS-onset impact range falls entirely within the 1,000 m Rsafe mitigation distance. With the implementation of the extended ramp-up mitigation procedure and associated MMMP measures (monitoring and soft-start procedures), marine mammals are expected to be displaced from the impact area prior to the onset of full hammer energy. Consequently, no animals are expected to be exposed to sound levels capable of causing auditory injury (PTS).*

[2]*The number of animals disturbed and the reference population are representative of the scaled East region of RoI population (Morris and Duck, 2019). The number of animals disturbed is not representative of the numbers disturbed within the Lambay Island SAC.*

6.4.6.10 ~~6.4.3.5~~ Any threshold shifts in hearing caused by pile driving would manifest in the range of 2 – 10 kHz (Kastelein *et al.*, 2017). At a UK BEIS-funded export elicitation workshop in 2018, experts concluded that the probability of PTS significantly affecting the survival and reproduction of grey and harbour seals was very low, assuming a 6 dB PTS in the 2 – 10 kHz range (Booth ~~and Heinis, 2018~~*et al.*, 2019). This was further supported by conclusions found in ~~the study~~studies of tagged seals during the construction of the Lincs offshore windfarm in the UK which concluded that ~~either~~neither the survival ~~and~~or fitness of individuals ~~is not~~of the harbour seal population in the Wash and North Norfolk Coast SAC is affected or that seals are not developing PTS despite predictions of exposure that indicate that they should be~~.~~ (Hastie *et a*l., 2016; Russell *et al.,* 2016; Whyte *et al.*, 2020).

~~6.4.3.6 With regards to underwater noise produced by UXO clearance, there are two activities that produce noise, higher order detonation, and low-order clearance methods. It is unknown if there are UXO that require clearance at the time of this assessment, and therefore is unknown to what level of clearance will be carried out. Therefore, this assessment is based on high-order UXO clearance being carried out which is viewed as the worst-case scenario in terms of underwater noise generation.~~

~~6.4.3.7 The main underwater noise produced by high-order detonation is outside of the region of greatest sensitivity for seal species (Southall *et al.,* 2019), and there is a pronounced reduction in energy levels above ~5-10 kHz (von Beckmann *et al.,* 2015 and Salomons *et al.,* 2021). Due to this, with consideration of the above sensitivity, it is concluded that grey seals have a low sensitivity to this effect.~~

~~6.4.3.8 With regards to underwater noise produced by geophysical surveys, exact surveys and equipment is yet to be decided, therefore as a precautionary approach we have considered all types of noise generation from the varied survey types. Surveys such as multibeam EchoSounder (MBES) and side scan sonar (SSS) produce sounds which are sonar based and impulsive. Surveys comprising of vibrocoring typically produce non-implusive sound. The equipment's noise source levels are provided in~~ Table 6.~~9 and Table 6.10.~~

~~6.4.3.9 Very limited information exists on the impacts of site surveys (geophysical and geotechnical) to marine mammals, with most available studies investigating the use of seismic airguns and focused on cetaceans, not seals. With consideration that seals have a lower sensitivity to underwater noise compared to cetaceans, we will consider studies on cetaceans on a precautionary basis, assuming that any predicted impact would be reduced with the species low sensitivity.~~

~~6.4.3.10 A study by Lucke *et al.* (2009) indicated that TTS could be induced in harbour porpoise at 350 m when exposed to an airgun impulse at a peak pressure of 200 dB_{pk-pk} re 1 µPa with corresponding SEL of 164.5 dB re $\mu Pa^2{}_s$) in shallow waters (~4 m), however this study is highly conservative as it assumes that the animal would remain stationary throughout the exposure. Evidence from other studies suggests that harbour porpoises exposed to such noise sources would likely move away from the source, and therefore leave the impact range of PTS-onset (Hermannsen *et al.,* 2015). Furthermore, it is expected that vessel presence will act as a deterrent to harbour porpoise, reducing the risk of auditory injury (Benhemma-Le Gall *et al.,* 2023). Therefore, it is highly unlikely that harbour porpoise will be present in the immediate vicinity at the start of any survey activity. The same can be applied to harbour seal which we view would be highly unlikely to be present within the immediate vicinity, and with consideration of their reduced sensitive, conclude this is a negligible risk for injury.~~

~~6.4.3.11 While PTS is a permanent effect which cannot be recovered from, the most likely response of a marine mammal to noise levels that could induce TTS is to flee the area (Southall *et al.,* 2007). Therefore, animals exposed to these noise levels that could induce TTS are likely to actively avoid hearing damage by moving away from the source.~~

6.4.6.11 In addition, the Developer has committed to the implementation of project-specific mitigation measures during piling activities, as set out within the MMMP (NIS Volume III, Appendix 25.2: Marine Mammal Mitigation Plan (Revised March 2026)), which are applicable to both cetacean and pinniped receptors. These measures are designed to minimise the risk of auditory injury (PTS) to seals arising from piling-related underwater noise and will, as a minimum, adhere to relevant international best practice, including DAHG (2014) guidance (Table 6.7). Implementation of the MMMP will ensure that the risk of injury to seal receptors is appropriately controlled and reduced to a negligible level.

6.4.6.12 In relation to the site-specific COs for Lambay Island SAC (Table 5.1), the potential effects of underwater noise associated with pile driving on grey seals have been assessed with respect to the attributes of access to suitable habitat and disturbance. The breeding, moulting and resting behaviour attributes relate specifically to disturbance or physical alteration of haul-out sites within the SAC boundary. As the Proposed Development is located approximately 61.89 km from the Lambay SAC and it will not result in any direct or indirect effects on haul-out habitats within the site, these attributes are not considered further within this assessment.

6.4.6.13 Regarding access to suitable habitat attribute, pile driving activities and the associated underwater noise (which could potentially cause auditory injury) will be short-term and temporary in nature and will not result in permanent habitat exclusion. Predicted PTS-onset impact ranges (maximum of 60 m) are substantially smaller than the distance to Lambay Island SAC, which is approximately 62.80 km from the Array Area (with the closest piling location), and therefore do not overlap the SAC boundary. As such, grey seals within the SAC will not be exposed to levels of underwater noise capable of resulting in auditory injury. Any highly unlikely auditory injury to individuals occurring outside the SAC would not impede access to suitable habitat within the site.

6.4.6.14 Regarding the disturbance attribute, even in the highly unlikely event that an individual experienced PTS-onset, available evidence indicates that would be unlikely to significantly affect individual fitness (i.e. its ability to survive and reproduce; Kastelein *et al.*, 2017). Therefore, pile driving activities are not expected to introduce man-made energy at levels capable of causing significant negative effects on individual grey seals or the wider population associated within, or connected to, Lambay Island SAC, nor is it expected to cause injury or mortality at levels capable of affecting site integrity.

6.4.6.15 **With consideration of the implementation of the extended ramp-up scenario and project-specific MMMP measures ensuring that no animals are within the area of predicted auditory injury (PTS-onset) ranges, the absence of overlap with the SAC (with the greatest predicted impact range of up to 60 m), and the negligible proportion of the wider population potentially affected (<0.01%), it is concluded there will be no AEoI of the grey seal QI of the Lambay Island SAC, as defined by its COs, as a result of auditory injury due to underwater noise associated with piling for Project Design Option 1.**

6.4.6.16 **Based on the representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

BEHAVIOURAL DISTURBANCE

6.4.6.17 The number of grey seals predicted to experience behavioural disturbance as a result of pile driving during construction is presented in Table 6.25. Disturbance was quantified using the dose-response relationship for impulsive noise for seals developed by Whyte *et al.* (2020) and expressed as a proportion of the relevant reference population (Table 6.6).

6.4.6.18 There are no corresponding data for grey seals and, as such, the harbour seal dose-response function is applied to the grey seal disturbance assessment. This is considered an appropriate proxy for grey seal as both species are categorised within the same functional hearing group. However, it is likely to result in an over-estimation of grey seal response as this assessment

has concluded that grey seals are less sensitive to behavioural disturbance than harbour seals, therefore the application of the harbour seal dose-response function to grey seal is considered conservative.

6.4.6.19 For both the ramp-up mitigation and extended ramp-up mitigation scenarios, using the uniform density estimate of 0.08 animals/km^2 extracted from Carter *et al.* (2020), it is estimated that 89 grey seals (5.35% of the reference population of 1,662 within the East region of RoI (Morris and Duck, 2019)) may experience behavioural disturbance as a result of pile driving at the N WTG location (Table 6.25).

6.4.6.20 At its maximum extent, the 145 dB SEL$_{ss}$ re 1 µPa^{2}s disturbance contour does not intersect the boundary of Lambay Island SAC (Figure 6.15). The closest point of the SAC is located approximately 39.65 km beyond the outer edge of the disturbance contour generated by piling at the N WTG location.

Table 6.25: Predicted impact of disturbance to grey seal from pile driving at SW WTG location using dose-response curves. For further information on densities used; see Table 6.6

Piling Scenario	Piling location and Monopile diameter (m)		Density (animals/km^2)	Number of animals disturbed[1]	Percentage of reference population[1] (%)
Ramp-up and extended ramp-up mitigation scenarios	N WTG	11 m	0.08	89	5.35

[1]*The number of animals disturbed and the reference population are representative of the scaled East region of RoI population (Morris and Duck, 2019). The number of animals disturbed is not representative of the numbers disturbed within the Lambay Island SAC.*

6.4.6.21 The impact on grey seal is considered to result in a small number and proportion of the population affected with change expected to be recoverable, occur frequently throughout the construction phase, is reasonably expected to occur, and have intermittent and temporary consequences but is very unlikely to affect the population trajectory.

6.4.6.22 Furthermore, the results of the iPCoD modelling show that there is no significant effect of disturbance resulting from pile driving at the Proposed Development to grey seal, with the impacted population predicted to continue at a stable trajectory at exactly the same size (100%) as the un-impacted population up to 24 years after piling has ceased.

6.4.6.23 ~~6.4.3.12~~ With consideration of disturbance and displacement caused by activities such as piling, there is limited information on the behavioural responses of grey seals to underwater noise. ~~Studies in the Netherlands collected telemetry data from 20 grey seals in 2014 during the during the~~Telemetry studies conducted during construction of the Luchterduinen ~~windfarm and from 16 grey seals in 2015 during the construction of the Gemini windfarm (Aarts *et al.*, 2018). The most common response suggested a change in behaviour~~and Gemini offshore windfarms in the Netherlands recorded behavioural changes in grey seals, most commonly a temporal shift from foraging to horizontal movement, ~~although various~~alongside other responses ~~were recorded~~ including~~,~~ altered surfacing and diving behaviour, changes in swim direction, ~~and no response~~or no observable responses (Aarts *et al.*, 2018). ~~Data~~Importantly,

individuals from this study ~~also showed that seals returned to the~~were observed to return to the affected area on subsequent trips, despite receiving ~~multiple exposures~~repeated exposure, indicating an absence of long-term displacement.

6.4.6.24 Grey seals are highly adaptable and resilient to short-term disturbance due to their generalist foraging strategy, mobility, and capacity to compensate for lost foraging opportunities (Smout *et al.*, 2014; Stansbury *et al.*, 2015). Their ability to tolerate periods of reduced feeding and to utilise alternative foraging areas supports a high capacity for recovery following disturbance due to their large body size and thick layer of blubber (i.e. more energy reserve) (Pomeroy *et al.*, 1999). In addition, they are wide ranging and can travel large distances (up to 488 km; Carter *et al.*, 2022) between different haul out and foraging regions, although on average, distances tend to be approximately 65 km (McConnell *et al.*, 1999). Therefore, behavioural responses to piling are expected to be temporary and reversible, with no lasting implications for individual fitness or population-level processes.

6.4.6.25 For grey seals, the project-specific mitigation measures set out within the MMMP (NIS Volume III, Appendix 25.2: Marine Mammal Mitigation Plan (Revised March 2026)), although primarily designed to minimise the risk of auditory injury (PTS) arising from piling-related underwater noise, will also act to reduce the magnitude and spatial extent of behavioural disturbance. Measures including pre-activity monitoring and controlled initiation of piling will reduce the likelihood of seals being exposed to the highest sound levels, thereby limiting the potential for strong avoidance or displacement responses. As a result, any behavioural disturbance experienced by seals is expected to be temporary and reversible and not of a scale or duration that would undermine the relevant COs.

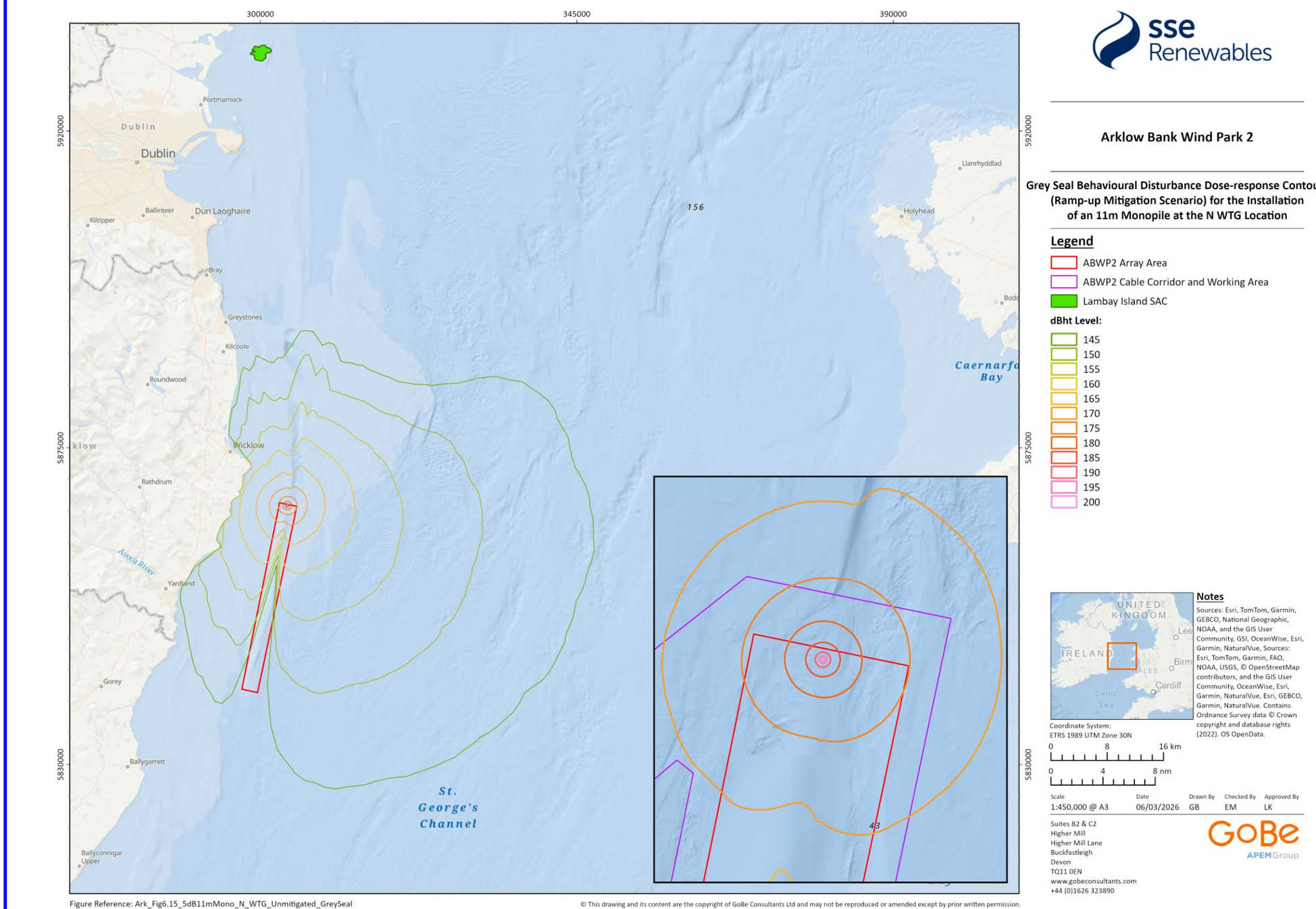
6.4.6.26 In relation to the site-specific COs for Lambay Island SAC (Table 5.1), the potential effects of underwater noise associated with pile driving on grey seals have been assessed with respect to the attributes of access to suitable habitat and maintain human activities below levels which would adversely affect the grey seal population at the site (disturbance). The COs relating to breeding, moulting, and resting behaviour are not considered further in this assessment, as pile driving activities will occur entirely outside the SAC and will not affect haul-out sites or habitats used for these behaviours.

6.4.6.27 While underwater noise generated from piling may result in temporary displacement of grey seals, any behavioural response is expected to be limited to the period of piling. In line with NPWS guidance (2013b), such temporary disturbance does not constitute a permanent barrier to habitat use of the site (due to the temporary nature of the activity) and will not permanently prevent grey seals accessing suitable habitat within the SAC.

6.4.6.28 Some individuals associated with the Lambay Island SAC (but none within the Lambay Island SAC itself) may experience temporary behavioural disturbance as a result of pile driving; however, this is not predicted to result in mortality, injury, or significant negative effects on individual fitness or reproductive success for any life stage, nor is it expected to ultimately affect the grey seal population at the site.

6.4.6.29 **With consideration of the precautionary nature of the assessment, the low proportion of the population predicted to be exhibit a behavioural response, and the recoverable and temporary (although repeated) nature of behavioural disturbance, the implementation of mitigation measures, it is therefore concluded there will be no AEoI of the grey seal QI of the Lambay Island SAC, as defined by its COs, as a result of behavioural disturbance due to underwater noise during pile driving from Project Design Option 1.**

6.4.6.30 **Based on the representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**



sse Renewables

Arklow Bank Wind Park 2

Grey Seal Behavioural Disturbance Dose-response Contours (Ramp-up Mitigation Scenario) for the Installation of an 11m Monopile at the N WTG Location

Legend

- ABWP2 Array Area
- ABWP2 Cable Corridor and Working Area
- Lambay Island SAC

dBht Level:

- 145
- 150
- 155
- 160
- 165
- 170
- 175
- 180
- 185
- 190
- 195
- 200

Notes

Sources: Esri, TomTom, Garmin, GEBCO, National Geographic, NOAA, and the GIS User Community, GSI, OceanWise, Esri, Garmin, NaturalVue, Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community, OceanWise, Esri, Garmin, NaturalVue, Esri, GEBCO, Garmin, NaturalVue. Contains Ordnance Survey data © Crown copyright and database rights (2022). OS OpenData.

Coordinate System:
ETRS 1989 UTM Zone 30N

0 8 16 km

0 4 8 nm

Scale	Date	Drawn By	Checked By	Approved By
1:450,000 @ A3	06/03/2026	GB	EM	LK

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Figure Reference: Ark_Fig6.15_5dB11mMono_N_WTG_Unmitigated_GreySeal

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Figure 6.15: Behavioural disturbance dose-response contours (ramp-up mitigation scenario) for the installation of an 11 m monopile at the N WTG location and Lambay Island SAC for grey seal QI

6.4.3.13 During an expert elicitation workshop in 2018, it was concluded that grey seals were considered to have a reasonable ability to compensate for missed foraging opportunities due to disturbance from underwater noise given their generalist diet, adequate fat stores, mobility, and life history (Booth *et al.*, 2019). In general, experts agreed that grey seals would be more robust to the effects of disturbance than harbour seals as they have larger energy store and are more generalist in their diet and more adaptable in their foraging strategies (Booth *et al.*, 2019). Experts also agreed that moderate-high levels of repeated disturbance would be required for any effect on grey seal fertility rates (Booth *et al.*, 2019).

6.4.3.14 Grey seals are highly adaptable to a changing environment. They can adjust their metabolic rate and foraging strategies and can compensate for lost opportunities due to their generalist diet, mobility, and adequate fat stores (Smout *et al.*, 2014; Stansbury *et al.*, 2015). They are also able to tolerate periods of fasting as part of their life history because of their large body size and thick layer of blubber (i.e. more energy reserve) (Pomeroy *et al.*, 1999). In addition, they are wide ranging and can travel large distances (up to 488 km) between different haul out and foraging regions, although on average, distances tend to be approximately 65 km (McConnell *et al.*, 1999). Therefore, we consider grey seals to be of high adaptability, have reasonable to high tolerance and have high recoverability to underwater noise.

6.4.3.15 Available guidance on assessing the significance of noise disturbance from UXO detonation against the conservation objectives of SACs with grey seals as qualifying interests is limited, however the closest relevant guidance is with regards to harbour porpoise SACs within England, Wales and Northern Ireland. As a species is considered to be more sensitive to these impacts than seals we have adopted that guidance on a precautionary basis, and impacts are viewed to likely be lesser. The guidance recommends an effective deterrence range (EDR) of 26 km for high-order detonations (JNCC, 2020). It should be noted that this EDR is based upon avoidance from piling, not UXO clearance, and the same guidance states that '*a one-off explosion would probably only elicit a startle response and would not cause widespread and prolonged displacement*'. With consideration of the resilience of the species highlighted above, it is concluded that grey seal are not sensitive to UXO clearance behavioural disturbance effects when considering the integrity of the designated site.

6.4.3.16 With consideration of disturbance caused by geophysical and geotechnical surveys, there are also few studies on the effects of seismic airguns on seals. Detailed observations of the behavioural and physiological responses of harbour seal were recorded by Thompson *et al.* (1998) using controlled exposure experiments with small air guns (source levels of 215-224 dB re 1µPa peak-to-peak). These experiments showed that grey seals exhibit avoidance behaviour when exposed to a single airgun or small array, switching from foraging to transiting behaviour, whilst harbour seals exhibited dramatic avoidance behaviour and stopped feeding (Thompson *et al.*, 1998). With consideration of the above behavioural effects of piling, it is anticipated that grey seals will show similar levels of avoidance and return behaviours, just within a smaller area based on the reduced distance the noise produced will go in comparison to piling.

6.4.3.17 The assessment has been informed by the Underwater Noise Assessment by Subacoustech (Volume III, Appendix 11.1) which includes the results of numerical modelling using the INSPIRE underwater noise model.

~~CONSTRUCTION AND DECOMMISSIONING~~

~~6.4.3.18 Piling will only be carried out during the construction phase of the Proposed Development. Based on calculations and data presented in Table 6.16, it is calculated that the maximum instantaneous PTS-onset impact range is 60 m (11 m monopile at the SW location and 7 m or 14 m monopile at the S-OSP location) with other piling locations having a reduced range. Based on this modelling and the survey results, no seals are expected to be impacted. Using the cumulative PTS-onset thresholds, the maximum impact range is 500 m (for an 11 m monopile at the C location, all other locations have a reduced impact range), which still calculates as no seals being impacted by these activities. TTS is only a temporary impact and within consideration of the evidence clarified above with the assessment of the PTS impacts, although potentially impacting a much larger area, when in consideration of the integrity of the SAC poses a negligible risk as all impacts are short term and temporary. With additional consideration of the avoidance through design of the Proposed Development incorporated into the activities, specifically the MMMP, this will serve to further minimise any risk posed to grey seals.~~

~~6.4.3.19 With regards to UXO clearance, based on the modelling presented in~~ Table 6.~~17~~26 ~~the maximum PTS-onset impact range is 2.8 km. This would result in 2 grey seal (0.12% of the population) experiencing PTS from a high-order detonation with the greatest charge weight.~~

Table 6.16: PTS-onset from pile driving and disturbance at array locations with grey seal densities estimates

Piling location and Monopile		Density (animals/km²)	Area (km²)	Maximum range (m)	Number of animals	% of reference population
Instantaneous PTS-onset (unweighted SPLpeak)						
NW	7 m	0.08	<0.01	<50	0	0.00
	11 m		0.01	<50	0	0.00
C	7 m	0.08	0.01	50	0	0.00
	11 m		0.01	50	0	0.00
SW	7 m	0.08	0.01	<50	0	0.00
	11 m		0.01	60	0	0.00
N-OSP	7 m	0.08	0.01	<50	0	0.00
	14 m		0.01	<50	0	0.00
S-OSP	7 m	0.08	0.01	60	0	0.00

Piling location and Monopile		Density (animals/km²)	Area (km²)	Maximum range (m)	Number of animals	% of reference population
	14 m		0.01	60	0	0.00
Cumulative PTS-onset (weighted SELcum)						
NW	7 m	0.08	<0.01	<100	0	0.00
	11 m		<0.01	<100	0	0.00
C	7 m	0.08	0.3	400	0	0.00
	11 m		0.3	500	0	0.00
SW	7 m	0.08	0.1	380	0	0.00
	11 m		0.2	400	0	0.00
N-OSP	7 m	0.08	<0.1	<100	0	0.00
	14 m		<0.1	<100	0	0.00

Piling location and Monopile		Density (animals/km²)	Area (km²)	Maximum range (m)	Number of animals	% of reference population
S OSP	7 m	0.08	<0.1	200	0	0.00
	14 m		<0.1	200	0	0.00
Predicted disturbance						
NW	7 m	0.08	-	-	130	7.83
	11 m		-	-	132	7.95
C	7 m	0.08	-	-	269	16.21
	11 m		-	-	271	16.32
SW	7 m	0.08	-	-	297	17.86
	11 m		-	-	299	18.00
N OSP	7 m	0.08	-	-	155	9.31

~~Piling location and Monopile~~		~~Density (animals/km²)~~	~~Area (km²)~~	~~Maximum range (m)~~	~~Number of animals~~	~~% of reference population~~
~~S-OSP~~	~~14 m~~	~~0.08~~	~~-~~	~~-~~	~~157~~	~~9.42~~
	~~7 m~~		~~-~~	~~-~~	~~297~~	~~17.89~~
	~~14 m~~		~~-~~	~~-~~	~~300~~	~~18.07~~

AUDITORY INJURY (PTS)

6.4.6.31 Based on the modelling results presented in Table 6.~~17~~26, the maximum PTS-onset range for grey seals resulting from high order UXO clearance is 2.8 km, based on the unweighted SPL_{peak} criterion and the largest charge weight modelled (800 kg plus donor). Using the average density estimate scaled from count data (Carter *et al.*, 2020), this would result in up to two grey seals, representing 0.12% of the reference population of 1,662 within the East region of RoI (Morris and Duck, 2019), being within PTS-onset range under the most precautionary scenario.

6.4.6.32 For low order clearance, the predicted PTS-onset ranges are smaller, with a maximum range of 0.24 km (Table 6.~~17~~26). At this range, less than one grey seal is predicted to experience PTS, representing <0.01% of the reference population.

Table 6.~~17~~26: PTS-onset ~~from UXO clearance and disturbance at array locations with~~ranges and numbers of grey seal ~~densities estimates~~modelled to be within range for all potential charge weights

Charge Weight (kg)	Maximum range (~~m~~km)	Density ~~of species~~ (animals/~~km²~~km²)	Number of ~~animals~~animals[1]	~~%~~Percentage of reference ~~population~~population[1] (%)
PTS-onset (unweighted SPL_{peak})				
0.5 (low order)	~~240~~0.24	0.08	<1	<0.01
25 + donor	~~910~~0.91	0.08	~~<~~1	0.01
55 + donor	~~1,100~~1.1	0.08	~~<~~1	0.02
120 +donor	~~1,500~~1.5	0.08	1	0.03
240 + donor	~~1,900~~1.9	0.08	1	0.05

Charge Weight (kg)	Maximum range (~~m~~km)	Density ~~of species~~ (animals/~~km~~^{2}km^2)	Number of ~~animals~~animals[1]	~~%~~Percentage of reference ~~population~~population[1] (%)
525 + donor	~~2,500~~2.5	0.08	2	0.09
700 + donor	~~2,700~~2.7	0.08	2	0.11
800 + donor	~~2,800~~2.8	0.08	2	0.12
PTS-onset (weighted SELss)				
0.5 (low order)	~~60~~0.06	0.08	0	~~0.0~~0.00
25 + donor	~~390~~0.39	0.08	<1	<0.01
55 + donor	~~570~~0.57	0.08	<1	<0.01
120 +donor	~~830~~0.83	0.08	~~<~~1	0.01
240 + donor	~~1,100~~1.1	0.08	~~<~~1	0.02

Charge Weight (kg)	Maximum range (~~m~~km)	Density ~~of species~~ (animals/~~km~~^{2}km^2)	Number of ~~animals~~animals[1]	~~%~~Percentage of reference ~~population~~population[1] (%)
525 + donor	~~1,600~~1.6	0.08	1	0.04
700 + donor	~~1,900~~1.9	0.08	1	0.05
800 + donor	~~2,000~~2.0	0.08	~~1~~2	0.06
~~***Disturbance***~~[1] *The number of animals disturbed and the reference population are representative of the scaled East region of RoI population (Morris and Duck, 2019). The number of animals disturbed is not representative of the numbers disturbed within the Lambay Island SAC.*				
~~High Order Clearance~~	~~26,000~~	~~0.08~~	~~170~~	~~10.22~~
~~Low Order Clearance~~	~~5,000~~	~~0.08~~	~~10~~	~~0.38~~

~~6.4.3.20 **Therefore, it is concluded there will be no AEoI upon the integrity of Lambay Island SAC, as defined by the COs of the site, as a result of injury from underwater noise impacting grey seal from Project Design Option 1.**~~

6.4.6.33 The nearest boundary of the Lambay Island SAC approximately 61.89 km from the Proposed Development. As such, even under the largest charge weight modelled, the predicted PTS-onset ranges for both high-order and low-order UXO clearance do not overlap with the SAC. Therefore, no grey seals within the SAC are predicted to experience auditory injury as a result of UXO clearance activities associated with the Proposed Development.

6.4.6.34 Interpretation of the modelling results should take account of the frequency characteristics of high-order UXO detonation. The main underwater noise produced by high-order detonation is outside of the region of greatest sensitivity for seal species (Southall *et al.,* 2019), with a pronounced reduction in energy levels above approximately 5-10 kHz (von Benda-Beckmann *et al.,* 2015; Salomons *et al.,* 2021). On this basis, grey seals are considered to have a relatively low sensitivity to PTS-onset from UXO clearance in species with greater sensitivities at lower frequencies.

6.4.6.35 Furthermore, the Developer has committed to the implementation of project-specific mitigation measures for UXO clearance activities, as set out within the MMMP (NIS Volume III, Appendix 25.2: Marine Mammal Mitigation Plan (Revised March 2026)). These measures are designed to minimise the risk of auditory injury (PTS) to marine mammals arising from UXO-related noise. The mitigation strategy will, as a minimum, adhere to relevant international best practice, including DAHG (2014) guidance (Table 6.7).

6.4.6.36 In relation to the site-specific COs for Lambay Island SAC (Table 5.1), the potential effects of underwater noise associated with UXO clearance on grey seals have been assessed with respect to the attributes of access to suitable habitat and disturbance. The breeding, moulting and resting behaviour attributes are not considered relevant to the assessment of UXO clearance. Any UXO clearance activities will occur offshore, at distances far from any haul-out or breeding sites within the Lambay Island SAC and will not result in any direct or indirect effects on haul-out habitats within the site, these attributes are not considered further within this assessment.

6.4.6.37 UXO clearance and the associated underwater noise capable of causing auditory injury would be short-term and highly localised, typically comprising a single, one-off detonation at any given location. As such, UXO clearance would not create a permanent or long-term barrier to the use of suitable habitat within or connected to the SAC, nor would it result in any sustained exclusion of grey seals from the wider area.

6.4.6.38 Regarding the disturbance attribute, even in the highly unlikely event that an individual experienced PTS-onset, available evidence indicates that would be unlikely to significantly affect individual fitness (i.e. its ability to survive and reproduce; Kastelein *et al.*, 2017). Therefore, any UXO clearance activities are not expected to introduce man-made energy at levels capable of causing significant negative effects on individual grey seals or the wider population associated within, or connected to, Lambay Island SAC, nor is it expected to cause injury or mortality at levels capable of affecting site integrity.

6.4.6.39 **With consideration of the limited spatial extent of predicted auditory injury (PTS-onset) ranges, the absence of overlap with the SAC (with the greatest predicted impact range predicted of 2.8 km), the implementation of mitigation measures, and the negligible proportion of the wider population potentially affected (≤0.12%) even under the most precautionary scenario, it is concluded there will be no AEoI of the grey seal QI of the Lambay Island SAC, as defined by its COs, as a result of auditory injury due to underwater noise associated with UXO clearance for Project Design Options 1 and 2.**

BEHAVIOURAL DISTURBANCE

6.4.6.40 The number of grey seals predicted to experience behavioural disturbance as a result of high order UXO detonation, based on the application of an adapted 20 km EDR, is presented in Table 6.27. Using the density estimate of 0.08 animals/km^2, it is estimated that up to 93 animals (5.58% of the East region of the RoI reference population of 1,662 individuals; Morris and Duck, 2019) could be disturbed under this highly precautionary scenario.

6.4.6.41 For low order clearance, application of the 5 km EDR results estimated up to seven animals potentially disturbed, representing 0.42% of the MU reference population (Table 6.27). It should be noted that this estimate is illustrative only, as there is only limited empirical evidence to support a defined disturbance range for low order UXO clearance.

Table 6.27: Predicted impact of disturbance to harbour seals from UXO for both high order (20 km) and low order clearance (5 km) EDRs. For further information on densities used, see Table 6.6.

UXO Scenario	EDR	Density (animals/km^2)	Number of animals disturbed[1]	Percentage of the reference population[1] (%)
High Order Clearance	20 km^2	0.08	93	5.58

Low Order Clearance	5 km	0.08	7	0.42

[1]The number of animals disturbed and the reference population represents the scaled East region of RoI population (Morris and Duck, 2019). The number of animals disturbed is not representative of the numbers disturbed within the Lambay Island SAC.

[2]Reduced EDR to account for land overlap within the nominal 20 km radius (effective area 1,159.98 km^2 rather than 1,256.31 km^2)

~~6.4.3.21 **Based on the increased risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**~~

~~6.4.3.22 Based on the conclusions within Table 6.16, it is estimated that up to 300 grey seal will experience behavioural disturbance from piling in the S-OSP location with a 14 m monopile (the other locations having reduced numbers disturbed). This comprises of 18.07% of the estimated population. Underwater noise from UXO clearance and surveys are not anticipated to increase this, disturbing up to 170 grey seal. With consideration that it is concluded that grey seal had negligible sensitivity to this impact, despite the relatively moderate proportion of the population that may be subject to disturbance, the qualifying interests population trends or integrity will be unaffected.~~

6.4.6.42 The nearest boundary of Lambay Island SAC is located approximately 61.89 km from the Proposed Development. As such, the EDRs for UXO clearance do not overlap with the SAC. Therefore, no grey seals within the SAC are predicted to experience auditory injury as a result of UXO clearance activities associated with the Proposed Development.

6.4.6.43 Potential behavioural disturbance to marine mammals arising from UXO clearance activities has been considered through the implementation of the project-specific MMMP (NIS Volume III, Appendix 25.2: Marine Mammal Mitigation Plan (Revised March 2026)). The application of mitigation measures, informed by international best practice including DAHG (2014), will reduce the likelihood, spatial extent and duration of any behavioural responses, such that any disturbance would be temporary, localised and not of a nature that could affect population-level processes (Table 6.7).

6.4.6.44 Any behavioural disturbance associated with UXO clearance is therefore expected to affect a small proportion of the population (≤6.08%), be highly localised in time, recoverable, and infrequent during the construction phase. Given the single-pulse nature of the activity, it is concluded that grey seals are not sensitive to UXO clearance behavioural disturbance effects when considering the integrity of the designated site.

6.4.6.45 In relation to the site-specific COs for Lambay Island SAC (Table 5.1), the potential effects of underwater noise associated with UXO clearance on grey seals have been assessed with respect to the attributes of access to suitable habitat and maintain human activities below levels which would adversely affect the grey seal community at the site (disturbance). Breeding, moulting, and resting haul-out targets are not relevant as these occur outside the SAC and would not be impacted by UXO clearance.

6.4.6.46 Whilst underwater noise generated from UXO clearance may result in a short-term startle response and temporary displacement of some individuals outside of, but associated with the SAC, such disturbance would be brief in duration and would not constitute a permanent barrier to habitat use of the site.

6.4.6.47 Any individuals disturbed by UXO clearance are not predicted to experience significant negative effects on fitness, survival, or reproductive success for any life stage, nor is the activity expected to result in injury or mortality at a scale capable of affecting the grey seal community associated with Lambay Island SAC.

6.4.6.48 ~~6.4.3.23 Therefore, it is~~**With consideration of the precautionary nature of the assessment, the absence of overlap with the SAC, the low proportion of the population predicted to be affected, the extremely short-term and recoverable nature of behavioural disturbance, the implementation of mitigation measures, and the limited frequency of UXO clearance events, it is therefore concluded there will be no AEoI ~~upon the integrity of~~of the grey seal QI of the Lambay Island SAC, as defined by ~~the~~its COs ~~of the site~~, as a result of behavioural disturbance ~~from~~due to underwater noise associated with UXO clearance impacting grey ~~seal from~~seals for Project Design ~~Option~~Options 1 and 2.**

~~6.4.3.24 Based on the increased risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.~~

INJURY AND/OR DISTURBANCE FROM UNDERWATER NOISE DURING SITE SURVEYS

CONSTRUCTION PHASE ASSESSMENT

6.4.6.49 The Subsea Noise Assessment (Seiche Ltd., 2022) concluded that PTS-onset ranges from confirmatory site surveys are limited to relatively small distances from the sound source and vary by survey type and marine mammal FHG, with grey seals considered under Phocid pinnipeds (PW), together with harbour seals.

6.4.6.50 Like the other underwater noise assessments, whilst the TTS impact ranges are presented here, the implications of TTS are considered alongside behavioural disturbance, reflecting its temporary and recoverable nature and its relevance to short-term changes in behaviour rather than long-term population level effects.

6.4.6.51 Predicted impact ranges for auditory (PTS-onset) and TTS-onset to grey seals from site surveys are therefore the same as those for harbour seals and summarised within Table 6.23 (Section 6.4.2). The largest distances are summarised in Table 6.17 in section 6.4.1. The largest cumulative PTS-onset range is 71 m for SBP surveys, while the largest cumulative TTS-onset range is 255 m. Other survey activities have smaller ranges, typically tens of metres or less (Table 6.23; Seiche Ltd., 2022).

6.4.6.52 The nearest boundary of the Lambay Island SAC is approximately 61.89 km from the survey area, substantially greater than the maximum predicted PTS- or TTS-onset ranges for all survey activities (Table 6.23Table 6.17). As such, no grey seals within the SAC are predicted to experience auditory injury (PTS) or TTS as a result of these site surveys.

6.4.6.53 With consideration that grey seals have a lower sensitivity to underwater noise compared to harbour porpoise, the predicted impact ranges for grey seal presented in Table 6.23 are smaller compared to those outlined in Table 6.17. The implementation of a project-specific MMMP (NIS Volume III, Appendix 25.2: Marine Mammal Mitigation Plan (Revised March 2026); Table 6.7) during the geophysical surveys and adherence to DAHG (2014) guidance, is designed to address the most precautionary scenario exposure for harbour porpoise, the most noise-sensitive species, to negligible levels. As such, these measures provide a precautionary buffer, and the actual likelihood and spatial extent of PTS-onset for grey seals will be further reduced.

6.4.6.54 Predicted behavioural disturbance ranges are greater than PTS/TTS distances, with maximum distances up to 4.95 km for non-impulsive geophysical survey sound sources (SBP), 700 m for sparker, 1.32 km for seismic refraction, 10 km for vibrocore and 1.5 km for seismic CPT for all marine mammal FHGs (Seiche Ltd., 2022). USBL were not included in the Subsea Noise Assessment (Seiche Ltd., 2022) however, CSA Ocean Sciences Inc. (2020) estimated that the maximum distance to the Level B threshold (disturbance) is 50 m for all marine mammal hearing groups.

6.4.6.55 While some predicted disturbance ranges extend beyond the survey area, the closest distance to the Lambay Island SAC (61.89 km away) remains substantially greater than the predicted disturbance ranges, and any behavioural responses are expected to be short-term and reversible in nature.

6.4.6.56 In relation to the site-specific COs for Lambay Island SAC (Table 5.1), site survey activities are temporary, intermittent and spatially limited, and are not expected to result in sustained displacement, long-term habitat exclusion from the site. Any behavioural responses would be brief and limited to very few individuals outside of the SAC, without causing significant effects on individual fitness or population integrity. Furthermore, breeding, moulting and resting haul-out targets are not relevant for this impact because survey activities occur outside of the SAC.

6.4.6.57 **With consideration of the limited spatial extent of predicted impact ranges, the absence of overlap with the SAC (with the greatest predicted impact range predicted of up to 10 km), and the implementation of mitigation measures, it is therefore concluded there will be no AEoI of the grey seal QI of the Lambay Island SAC, as defined by its COs, as a result of auditory injury and behavioural disturbance due to underwater noise associated with site surveys associated with the construction phase for Project Design Options 1 and 2.**

OPERATIONAL AND MAINTENANCE PHASE ASSESSMENT

~~6.4.3.25 There are no piling activities proposed for the Operational and Maintenance phase of the Proposed Development. Any underwater noise produced will be due to vessel movements which is assessed in Section 0 to 0. **There is no potential for AEoI from underwater noise in the operational and maintenance phase of the Proposed Development on this site and feature, as defined by the COs of the site, for Project Design Option 1.**~~

~~6.4.3.26 **Based on the increased risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**~~

6.4.6.58 Routine geophysical surveys of inter-array, inter-connector, and export cables will occur every six months during the first two years and annually thereafter throughout the operational and maintenance phase of the Proposed Development (Table 6.8).

6.4.6.59 As the exact equipment is not yet confirmed, an assessment has been undertaken assuming the same survey equipment and source levels as that proposed in the pre-construction surveys (Table 6.15 and Table 6.16). Therefore, the impact ranges of auditory injury (PTS), TTS and behavioural disturbance from site surveys during the operational and maintenance phase are expected to be similar to the results of the Subsea Noise Assessment (Seiche Ltd., 2022; CSA Ocean Sciences Inc, 2020) conducted for site surveys during the pre-construction phase.

6.4.6.60 **With consideration of the limited spatial extent of predicted impact ranges, the absence of overlap with the SAC (with the greatest predicted impact range predicted of up to 10 km), and the implementation of mitigation measures, it is therefore concluded there will be no AEoI of the grey seal QI of the Lambay Island SAC, as defined by its COs, as a result of auditory injury and behavioural disturbance due to underwater noise associated with site surveys associated with the operational and maintenance phase for Project Design Options 1 and 2.**

INJURY AND/OR DISTURBANCE FROM UNDERWATER NOISE DURING DREDGING AND TRENCHING

CONSTRUCTION PHASE ASSESSMENT

6.4.6.61 The Underwater Noise Assessment (NIS Volume III, Appendix 11.1: Underwater Noise Assessment (Revised March 2026)) concluded that for non-impulsive construction activities,

including dredging and trenching, cumulative PTS could only occur at very short distances from the sound source. For trenching, backhoe dredging and suction dredging, predicted cumulative PTS- and TTS-onset ranges for grey seal (PCW FHG; Southall *et al.*, 2019) are <50 m.

6.4.6.62 Dredging and trenching activities produce continuous, non-impulsive underwater noise and are not expected to result in auditory injury (PTS) in marine mammals. The dominant energy from these activities typically occurs below 1 kHz (Todd *et al.*, 2015), which lies outside the peak hearing sensitivity range of grey seals (PCW FHG). As a result, the potential for PTS (or TTS) to occur from these construction activities is expected to have little relevance to individual fitness, survival or reproductive success, as the hearing sensitivity of these receptors is relatively poor below 1 kHz (Southall *et al.,* 2019).

6.4.6.63 Although PTS is a permanent effect, the very limited spatial extent of predicted PTS-onset ranges, together with the low sensitivity of grey seals to low-frequency noise, indicates that dredging and trenching are unlikely to result in auditory at levels that would affect population-level parameters.

6.4.6.64 Information on marine mammal sensitivity to dredging and trenching noise is limited, with available studies focusing primarily on the impact of behavioural disturbance from dredging. These studies have confirmed that dredging activities can result in short-term displacement and avoidance behaviour in marine mammals (e.g. Culloch *et al.*, 2016; Pirotta *et al.*, 2013). However, it is often difficult to distinguish the effects of underwater noise from disturbance associated with vessel presence required to undertake the activity (Todd *et al.*, 2015).

6.4.6.65 There are currently no empirical data describing grey seal responses specifically to dredging or trenching activities. In the absence of such data, it is assumed that behavioural responses and deterrence distances would be similar to those associated with dredging for harbour porpoise, and therefore limited to within 5 km, which is considered a precautionary upper bound for behavioural disturbance (McQueen *et al.*, 2020). Should behavioural disturbance occur, it is expected to be short-term and reversible, with animals returning to the area following cessation of activities.

6.4.6.66 The closest distance between dredging and trenching activities and the boundary of the Lambay Island SAC is approximately 61.89 km. This distance substantially exceeds the maximum predicted ranges for PTS-onset, TTS-onset and behavioural disturbance (5 km) associated with dredging and trenching.

6.4.6.67 In relation to the site-specific COs for Lambay Island SAC (Table 5.1), dredging and trenching during construction will not result in permanent or long-term restriction of access to suitable habitat within the SAC, nor introduce underwater noise at levels that would cause injury or sustained disturbance to the grey seal community associated with the site. Given the location of the activities well beyond the SAC boundary, breeding, moulting and resting haul-out sites within the SAC will not be affected.

6.4.6.68 **With consideration of the very limited spatial extent of predicted auditory injury (PTS-onset) ranges associated with dredging and trenching activities, the absence of overlap with the Lambay Island SAC (with the greatest predicted disturbance impact range of up to 5 km), and the temporary, localised and reversible nature of any behavioural disturbance, it is therefore concluded there will be no adverse effect of the grey seal QI of the Lambay Island SAC, as defined by its COs, as a result of underwater noise arising from dredging and trenching activities associated with the construction phase for Project Design Options 1 and 2.**

OPERATIONAL AND MAINTENANCE PHASE ASSESSMENT

6.4.6.69 During the operational and maintenance phase, dredging and trenching may be required intermittently for scour protection repair and maintenance of foundations and cables. These

activities are expected to be localised, short-term and less frequent than those undertaken during the construction phase.

6.4.6.70 Based on the predicted underwater noise modelling presented in the Underwater Noise Assessment (NIS Volume III, Appendix 11.1: Underwater Noise Assessment (Revised March 2026)), the precited ranges for PTS-onset, TTS-onset and behavioural disturbance during operation and maintenance are expected to be comparable to those assessed for the construction phase, assuming similar equipment and methods are anticipated to used.

6.4.6.71 The closest distance between dredging and trenching activities during the operation and maintenance phase and the boundary of the Lambay Island SAC is approximately 61.89 km. This distance substantially exceeds the maximum predicted ranges for auditory injury (PTS), TTS, and behavioural disturbance associated with dredging and trenching activities.

6.4.6.72 In relation to the Lambay Island SAC site-specific COs (Table 5.1), dredging and trenching during the operational and maintenance phase will not result in permanent or long-term restriction of access to suitable habitat within the SAC, nor introduce underwater noise at levels that would cause injury or sustained disturbance to the grey seal population. Breeding, moulting and resting haul-out sites within the SAC will not be affected due to the distance of the activities from the site.

6.4.6.73 **With consideration of the very limited spatial extent of predicted auditory injury (PTS-onset) ranges associated with dredging and trenching activities, the absence of overlap with the Lambay Island SAC (with the greatest predicted disturbance impact range of up to 5 km), and the temporary, localised and reversible nature of any behavioural disturbance, it is therefore concluded there will be no adverse effect of the grey seal QI of the Lambay Island SAC, as defined by its COs, as a result of underwater noise arising from dredging and trenching activities associated with the operational and maintenance phase for Project Design Options 1 and 2.**

INJURY AND/ OR DISTURBANCE FROM VESSEL MOVEMENTS

INJURY FROM VESSEL ACTIVITIES

~~6.4.3.27 There will be increased vessel movements compared to baseline levels during all phases of the Proposed Development, which can result in injury and/ or mortality from vessel collision, or disturbance though presence and the generation of noise.~~

~~6.4.3.28 The area surrounding the Proposed Development experiences a relatively low level of vessel traffic due to the presence of the shallow Arklow Bank sandbank, with higher traffic in the coastal areas and immediate surrounding waters.~~

~~6.4.3.29 The shipping and navigation baseline study recorded 29 days of vessel traffic data between 7 July and 14 August 2023. There was an average of 36 to 37 unique vessels per day recorded within the shipping and navigation Study Area (which is defined as Array Area and a 10 nm buffer). The busiest day recorded 59 unique vessels within the shipping and navigation Study Area. The main vessel types within the shipping and navigation Study Area were cargo vessels (40%), recreational vessels (31%) and fishing vessels (10%).~~

~~6.4.3.30 During construction of the windfarm, a potential source of impact from increased vessel activity is physical trauma from collision with a boat or ship. In general, three consequences of vessel collision are defined: direct (injuries to the animals that are the immediate result of collision), long-term (a decrease in the fitness of the animal over time), and population consequences (Schoeman *et al.*, 2020). With regards to injuries, both fatal and non-fatal injuries between marine mammals and vessels have been documented (Laist *et al.*, 2001; Vanderlaan *et al.*, 2008; Cates *et al.*, 2017). Fatal collisions have been evidenced via carcasses washing up on beaches (Laist *et al.*, 2001; Peltier *et al.*, 2019); carcasses caught on vessel bows (Laist *et al.*, 2001; Peltier *et al.*, 2019); and floating carcasses which have strong evidence of ship strike,~~

such as propeller cuts, significant bruising, oedema, internal bleeding radiating from a specific impact site, fractures and ship paint marks (Jensen and Silber, 2003; Douglas *et al.*, 2008). Fatalities from ship strikes, however, often go unreported (Authier *et al.*, 2014). For non-fatal injuries, evidence of animals which have survived ship strikes with non-fatal injuries from propellers has been widely documented (Wells *et al.*, 2008; Luksenburg, 2014).

6.4.3.31 Although many species of marine mammals are able to detect and avoid vessels, it is unclear why some individuals do not always move out of the path of an approaching vessel (Schoeman *et al.*, 2020), although it has been suggested that behaviours such as resting, foraging, nursing, and socialising could distract animals from detecting the risk posed by vessels (Dukas, 2002). It is also possible that animals do not hear vessels when they are near the surface. Collisions between cetaceans and vessels, however, are not necessarily lethal on all occasions.

6.4.3.32 Whilst a broad range of vessel types have been involved in collisions with marine mammals (Laist *et al.*, 2001), vessels travelling at higher speeds pose a higher risk because of the potential for a stronger strike impact (Schoeman *et al.*, 2020). For example, a study by Laist *et al.* (2001) found that in 89% of collisions in which the whale was killed or seriously injured vessels were travelling at speeds of 14 kn (7 m/s) or more, and the vessel exceeded a length of 80 m. Therefore, larger vessels travelling at 7 m/s or faster are those most likely to cause death or serious injury to marine mammals (Laist *et al.*, 2001).

6.4.6.74 6.4.3.33 Grey seals are relatively small and highly mobile pinnipeds with well-developed sensory abilities, and given observed responses to noise, are expected to detect vessels in close proximity and largely avoid collision. Evidence on collision risk for seals is not well understood, however trauma ascribed to collisions with vessels has been identified inlimited and typically reported across all species, rather than on a species-specific basis; however, studies indicate that vessel collision accounts for only a small proportion of both live strandedseal injuries and mortalities (Goldstein *et al.*, 1999) and dead stranded seals in the USA (; Swails, 2005). In these cases, however, less than 2% of all dead necropsied seals had vessel collision attributed to cause of death. A study in the Moray Firth showed that seals use the same areas as vessels during trips between haul-outs and foraging sites but that seals tended to remain beyond 20 m from vessels (only three instances over 2,241 days of seal activity resulted in passes at less than 20 m) (Onoufriou *et al.*, 2016), suggesting that the possibility of a risk of collision is very low.

6.4.6.75 Telemetry studies demonstrate that seals frequently co-occur spatially with vessel traffic but generally maintain separation distances that substantially reduce collision risk (Onoufriou *et al.*, 2016). On this basis, and consistent with the assessment presented for harbour seals (see Section 6.4.2), the likelihood of injury from vessel activities involving grey seals is considered to be very low.

6.4.3.34 Overall, the assessment concludes that there is a high likelihood that grey seals will avoid vessels and therefore collision risk is viewed as negligible, although they have a high sensitivity to the impact should it occur.

6.4.3.35 With regards to behavioural disturbance caused by noise from presence of vessels and their movements, grey seals are particularly sensitive to disturbance in regions where vessel traffic overlaps with productive coastal waters (Robards *et al.*, 2016). Vessel disturbance may be particularly detrimental to grey seal if it changes their haul-out patterns or reduces the time they are able to spend resting or nursing pups during the breeding season. When disturbed, seals that are hauled-out typically 'flush' (enter) into the water which could be detrimental during pupping season (Johnson and Acevedo-Gutiérrez, 2007). Key haul-outs for grey seal in proximity to the Proposed Development are at Arklow, co. Wicklow, along the coast of co. Dublin, and around Wexford Harbour (Duck and Morris, 2013; Morris and Duck, 2019). A study of vessel traffic and marine mammal presence at Broadhaven Bay, northwest Ireland found grey seals sightings decreased with increased vessel activity in the surrounding area, though

~~the effect size was small, and the relationships between sightings and vessel numbers were weaker than those with environmental variables such as sea state (Anderwald *et al.*, 2013).~~

~~6.4.3.36 Overall, it is concluded that with consideration that grey seals are adaptable, with a moderate tolerance and high recoverability, grey seals have a low sensitivity to this kind of impact. **Therefore, there is no AEoI for the Lambay Island SAC, as defined by the COs of the site, as a result of injury or disturbance from vessel movement.**~~

CONSTRUCTION AND DECOMMISSIONING PHASE ASSESSMENT

6.4.6.76 ~~6.4.3.37~~ During the construction phase, ~~a maximum of 66~~up to 69 installation vessels ~~will~~may be present within the Proposed Development at any one time, resulting in a maximum of 4,150 vessel return trips over the ~~five-year~~four-year construction period, and a maximum of 1,797 vessel return trips per year. A similar number of vessels are anticipated for the decommissioning phase.

6.4.6.77 ~~6.4.3.38~~ The majority of vessels used during the construction and decommissioning phase are likely to be large vessels that will ~~either be travelling considerably slower than 7 m/s (the key risk is when this speed is exceeded with large vessels) or~~operate at relatively low speeds or remain stationary for extended periods of time. The key collision risk threshold for larger vessels is generally associated with speeds exceeding approximately 7 m/s; however, such speeds are not anticipated to be routinely exceeded during construction and decommissioning activities, and they will be stationary for significant periods of time. ~~Therefore, the actual increase~~Consequently, increases in vessel traffic moving within the Proposed Development Array Area and Cable Corridor and Working Area along distinct transit routes and to/from port will ~~occur over short~~be intermittent and largely confined to discrete periods of ~~the~~ offshore ~~construction~~ activity.

6.4.6.78 Smaller vessels ~~involved in~~associated with construction and decommissioning activities (i.e. tug/anchor handlers, guard vessels, survey vessels, and crew transfer vessels) are more manoeuvrable than larger installation vessels and are therefore able to ~~move to~~ avoid marine mammals ~~(~~when detected~~)~~, even when an animal is close and the vessel is going at high speed~~, due to better manoeuvrability compared to larger vessels~~ (Schoeman *et al.*, 2020). In contrast, ~~large~~larger vessels, such as jack-up vessels, have low manoeuvrability and may require larger distances to avoid an animal, but travel at slower speeds~~.~~, reducing collision risk.

6.4.6.79 In addition, the ~~factored-in~~mitigation measures (see Table 6.7) which includes an ~~EVMP~~Environmental VMP (NIS Volume III, Appendix 25.10: Environmental Vessel Management Plan), will ensure that vessel traffic will move along predictable routes, which is known to be a key aspect in minimising the potential risks imposed by vessel traffic (Nowacek *et al.*, 2001; Lusseau, 2003; 2006). The ~~EVMP~~Environmental VMP also sets out a Code of Conduct to minimise interactions with marine mammals and to define how vessels should behave in the presence of them.

~~6.4.3.39 It is also anticipated that noise produced by the vessels will be detectable by the grey seals and therefore enable avoidance.~~

~~6.4.3.40 **It is concluded that there is no potential for AEoI upon the integrity of Lambay Island SAC, as defined by the COs of the site, as a result of injury from vessel collision impacting grey seal from Project Design Option 1.**~~

~~6.4.3.41 **Based on the increased risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**~~

6.4.6.80 Furthermore, the SAC boundary is located approximately 61.89 km from the Proposed Development. Whilst the vessel routes are not yet known, the likelihood of overlap between project-specific vessel traffic and the SAC is very low. Whilst grey seals may be present

outside the boundary of the SAC and within areas used by vessel traffic; however, the proportion of the population likely to be within the Project area is also very small given the distance from key SAC habitats. Therefore, vessel movements associated with the Proposed Development will not result in permanent or long-term restriction of access to suitable habitat within the SAC, as vessel activity is temporary, transitory, and does not constitute a fixed or continuous pressure capable of causing sustained displacement.

6.4.6.81 Considering the mobility of grey seals, the nature of construction vessel traffic, distance from the SAC boundary (61.89 km), and the implementation of Environmental VMP measures, vessel movements are not expected to result in permanent exclusion from suitable habitat, injury or population-level effects. **It is therefore concluded there will be no AEoI of the grey seal QI of the Lambay Island SAC, as defined by its COs, as a result of injury from vessel activities associated with the construction and decommissioning phases for Project Design Options 1 and 2.**

OPERARTION AND MAINTENANCE PHASE ASSESSMENT

6.4.6.82 During the operational and maintenance phase, a maximum of 30 vessels will be present within the Proposed Development at any one time, resulting in a maximum of 1,359 vessel return trips per year. Vessels that will be used during the operational and maintenance phase (up to 36.5 years) include crew transfer vessels, jack-up vessels, cable repair vessels.

6.4.6.83 As with construction activities, vessels operating during the operational and maintenance phase are expected to travel at relatively low speeds within the Proposed Development, with larger vessels either stationary or operating at slow speeds during maintenance activities. Smaller, more manoeuvrable vessels (e.g. crew transfer vessels) are able to alter course to avoid marine mammals when detected. Grey seals are therefore expected to detect and avoid vessels, resulting in a low likelihood of collision.

6.4.6.84 The continued implementation of mitigation measures, including the Environmental VMP (NIS Volume III, Appendix 25.10: Environmental Vessel Management Plan; Table 6.7), will ensure predictable vessel routing and adherence to appropriate vessel management procedures, further reducing collision risk. Given the lower vessel numbers relative to construction, the absence of novel vessel activity, and the high baseline levels of vessel traffic in the Irish Sea, vessel movements during operation and maintenance are not expected to materially increase collision risk for grey seals.

6.4.6.85 In relation to the site-specific COs for Lambay Island SAC (Table 5.1), vessel movements during the operational and maintenance phase will not result in permanent or long-term restriction of access to suitable habitat within the SAC, as vessel activity will be intermittent, transitory, and of lower intensity than during construction.

6.4.6.86 Given the relatively low vessel numbers, the intermittent and localised nature of any operation and maintenance activities, slow expected vessel speeds and continued application of Environmental VMP measures, vessel movements during operational and maintenance phase will not result in permanent habitat exclusion, injury or population-level effects. **It is therefore concluded there will be no AEoI of the grey seal QI of the Lambay Island SAC, as defined by its COs, as a result of injury from vessel activities associated with the operational and maintenance phase for Project Design Options 1 and 2.**

VESSEL DISTURBANCE

6.4.6.87 With regards to behavioural disturbance caused by noise from presence of vessels and their movements, grey seals are particularly sensitive to disturbance in regions where vessel traffic overlaps with productive coastal waters (Robards *et al.*, 2016). Vessel disturbance may be particularly detrimental to grey seal if it changes their haul-out patterns or reduces the time they are able to spend resting or nursing pups during the breeding season. When disturbed,

seals that are hauled-out typically 'flush' (enter) into the water which could be detrimental during pupping season (Johnson and Acevedo-Gutiérrez, 2007).

6.4.6.88 Underwater noise levels from introduced vessels will result in an increase in non-impulsive, continuous sounds primarily from propellers, thrusters, and various rotating machinery (e.g., power generation, pumps) in the vicinity of the Proposed Development. The main drivers influencing the magnitude of potential impact with respect to underwater noise disturbance from vessels are vessel type, speed and prevailing ambient noise levels (Wilson *et al.*, 2007). Disturbance from vessel noise is likely to occur only when vessel noise associated with the construction of the Proposed Development exceeds the background ambient underwater noise level.

CONSTRUCTION AND DECOMMISSIONING PHASE ASSESSMENT

6.4.6.89 During the construction phase, up to 69 installation vessels may be present within the Proposed Development at any one time, resulting in a maximum of 4,150 vessel return trips over the four-year construction period, and a maximum of 1,797 vessel return trips per year. A similar number of vessels are anticipated for the decommissioning phase.

6.4.6.90 ~~6.4.3.42 When considering the~~With consideration of disturbance and displacement, the coastal areas and immediate surrounding waters of the Proposed Development are already subject to high levels of vessel traffic~~. However, evidence shows there is no decrease in seal populations with high levels of co-occurrence between ships and seals. In areas where seal populations are showing high levels of growth (such as southeast England), ship co-occurrences are highest (Jones et al., 2017). With consideration of this, it is concluded that it is unlikely there will be a~~ (see EIAR Volume II, Chapter 15: Shipping and Navigation (Revised March 2026)). As such, the introduction of construction and decommissioning activities is not considered to represent a novel or significant change in the level of disturbance that grey seals naturally present are subject to. ~~The EVMP will serve to ensure that vessels follow predictable routes in addition to setting out how the vessels should behave in the presence of the species.~~

6.4.6.91 Evidence indicates that grey seal responses to vessels are primarily behavioural and context-specific. Studies have shown that hauled-out grey seals may exhibit alert or flushing responses in relation to vessel proximity, speed and duration of interaction (Britton, 2012). Given the distance between the Proposed Development and the haul-outs within the SAC (>61.89 km), it is considered highly unlikely that vessel traffic associated with the Proposed Development would pass the haul-outs close enough to lead to a disturbance or flushing response. However, any disturbance responses would be short-term and reversible, and there is limited evidence to suggest that vessel traffic results in sustained displacement or long-term behavioural change.

6.4.6.92 At-sea exposure studies further indicate limited sensitivity of grey seals to vessel noise. Trigg *et al.* (2020) found that grey seals in the Celtic Sea and English Channel were not exposed to cumulative shipping noise levels exceeding TTS thresholds. While some studies have reported reduced local sightings in areas of increased vessel activity, these effects were small and weaker than relationships with environmental variables such as sea state (Anderwald *et al.,* 2013). More broadly, high levels of spatial overlap between grey seals and vessels have not been associated with population decline, with some of the highest grey seal population growth rates occurring in areas of high vessel co-occurrence (southeast England; Jones *et al.,* 2017).

6.4.6.93 ~~6.4.3.43 The proposed~~The implementation of ~~a EVMP (~~mitigation measures, including the Environmental VMP (NIS Volume III, Appendix 25.10: Environmental Vessel Management Plan; Table 6.7), will further reduce the ~~risk of vessel disturbance by controlling the speed and movement of vessels, resulting in slower moving vessels travelling more predictable routes which are less likely to cause disturbance. This is supported by~~likelihood and magnitude of disturbance by ensuring predictable vessel routes, controlled speeds and clear procedures for

minimising interactions with marine mammals. Vessel simulation modelling ~~by Findlay et al. (2023) which predicted that, when animals were exposed to vessels at a given distance with both a 20% and a 50% reduction in speed, all potential noise impacts were reduced. At a 20% reduction in speed, the vessel noise swath halved, reducing the average~~indicates that reductions in vessel speeds of 20-50% can reduce underwater source noise (by 5 dB for 20% and 18 dB for 50%) and the number of animals exposed ~~by 50% and therefore reducing the number of animals that are likely to be disturbed~~ (Findlay *et al.*, 2023). ~~In addition, the study demonstrated that moderate slowdowns strongly reduce vessel source levels, with a 20% reduction in speed decreasing mean source levels by 6 dB and a 50% speed reduction by 18 dB (Findlay et al., 2023).~~

~~6.4.3.44 It is concluded that the any disturbance above current baseline levels of activity will only result in a short-term and temporary impact on behaviour, and the above assessments of the impact of underwater noise supports the conclusion that grey seals typically return to similar abundance as before within two hours of cessation of the activities causing disturbance.~~

6.4.6.94 ~~6.4.3.45 **Therefore, it is**~~**With consideration of the low likelihood, temporary, localised and reversible nature of vessel-related behavioural responses, the existing high baseline of vessel activity, the absence of evidence for population-level effects, and the implementation of Environmental VMP measures to reduce risk, vessels movements during construction and decommissioning phase are not expected to result in long-term displacement or interference with key behaviours associated with the SAC. It is therefore concluded that there will be no AEoI ~~upon the integrity of~~of the grey seal QI of the Lambay Island SAC, as defined by ~~the~~its COs ~~of the site~~, as a result of disturbance from vessel ~~movement impacting grey seal from Project Design Option 1.~~**

~~6.4.3.46~~ **activities associated with ~~Based on the increased risk of effect of~~the construction and decommissioning phase for Project Design ~~Option~~Options 1~~, it is concluded that no AEoI would also apply to Project Design Option~~ and 2.**

OPERATIONAL AND MAINTENANCE PHASE ASSESSMENT

6.4.6.95 ~~6.4.3.47~~ During the operational and maintenance phase, a maximum of ~~22~~30 vessels will be present within the ~~Array Area~~Proposed Development at any one time, resulting in a maximum of ~~1,294~~1,359 vessel return trips per year. ~~With consideration that this is a significant reduction in the number of vessels present in comparison to the Construction and decommissioning phase, it is concluded that based on the assessment for that phase, there is no potential for significant effect.~~

6.4.6.96 Vessel activity during the operational and maintenance phase represents a reduction in both vessel numbers and intensity compared to the construction and decommissioning phases. As during construction, vessel movements will be subject to the Environmental VMP (NIS Volume III, Appendix 25.10: Environmental Vessel Management Plan; Table 6.7), ensuring predictable routing, controlled speeds and adherence to mitigation measures designed to minimise disturbance to marine mammals

6.4.6.97 ~~6.4.3.48 **Therefore, there is no AEoI upon the integrity of**~~ In relation to the site-specific COs for Lambay Island SAC (Table 5.1), any behavioural responses remain temporary and localised, with animals expected to return following any displacement, there is no mechanism by which vessel disturbance could result in long-term displacement or interference with key life-history behaviours of grey seals associated with the site**. It is therefore concluded that there will be no AEoI of the grey seal QI of the Lambay Island SAC, as defined by ~~the~~its COs ~~of the site~~, as a result of disturbance ~~or collision risk~~ from vessel ~~movement impacting grey seal from~~activities associated with the operational and maintenance phase for Project Design ~~Option~~Options 1 ~~in this phase~~and 2.**

6.4.3.49 **Based on the increased risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

CHANGES IN FISH AND SHELLFISH COMMUNITY AFFECTING PREY RESOURCES

6.4.6.98 Potential impacts to prey resources arising from the Proposed Development are expected to be largely restricted to the boundaries of the Proposed Development due to the localised footprint of seabed disturbance, the temporary nature of construction activities, and the limited spatial extent of predicted underwater noise and sediment dispersion effects. As such, any indirect effects on grey seals via changes in prey availability would be limited to individuals foraging within, or close proximity to the Proposed Development.

6.4.6.99 6.4.3.50 Grey seal are primarily dependent onexploit a wide range of prey species, including poor cod, salmonids, sandeel, dragonet, whiting, bib (*Trisopterus luscus*), blue whiting (*Micromesistius poutassou*), haddock (*Melanogrammus aeglefinus*), pollock (*Pollachius pollachius*), saithe (*Pollachius virens*), herring, rockling, Norway pout, (*Trisopterus esmarkii*), Atlantic mackerel, hake (*Merluccius merluccius*), eels (*Anguilla* spp.), wrasse (*Labridae* spp.), perch (*Perca fluviatilis*), sole, halibut (*Hippoglossus* spp.), dab, (*Limanda limanda*), a range of flatfish species, (*Pleuronectiformes* spp.), as well as cephalopods including squid species and octopus species for food (Gosch *et al.,* 2014; Wilson and Hammond, 2019).

6.4.6.100 This broad spectrum demonstrates a very highly varied diet and ability to adapt to changes in availability of prey types where needed and so harbour porpoise arehigh degree of dietary flexibility, with grey seals able to switch between prey types in response to local availability. Grey seals are therefore considered generalist feeders with a high capacity to adapt to localised and temporary changes in prey resources.

CONSTRUCTION AND DECOMMISSIONING PHASE ASSESSMENT

6.4.6.101 Grey seals have a generalist diet, as can also be said for other Annex II marine mammal species including harbour porpoise. The assessment of the impact from changes in prey to the harbour porpoise QI of Blackwater Bank SAC has been undertaken at a high-level across changes to the prey community, rather than reflecting species-specific prey preferences. It is also highlighted that the diet of harbour porpoise (predominantly whiting, Atlantic herring, and poor cod) has overlap with that of grey seal. Accordingly, the assessment of changes in the fish and shellfish community affecting prey resources for the Blackwater Bank SAC are considered applicable to SACs for grey seal, including Lambay Island SAC.

6.4.6.102 6.4.3.51 Impacts to prey resources will be largely restricted to the boundaries of the Proposed Development and, therefore, grey seal occurring within this area also have the potential to be impacted. ThePotential impacts on prey species are not qualifying interest species specific, with prey species for grey seal subject to the same impacts as the prey species as theassociated with construction and decommissioning activities are not specific to grey seal QIs and have been comprehensively assessed for other Annex 2II marine mammal species considered within this assessment (bottlenose dolphin,receptors, notably harbour porpoise and harbour seal). A full assessment on the impacts ofwithin Blackwater Bank SAC (Section 6.4.1). Blackwater Bank SAC is located approximately 19.13 km from the Proposed Development on prey species has been considered , substantially closer than the Lambay Island SAC (approximately 61.89 km), and that assessment is therefore considered precautionary when applied to the grey seal QI of Lambay Island SAC.

6.4.6.103 As detailed in Section 6.4.1 and EIAR Volume II, Chapter 10: Fish, Shellfish and Sea Turtle Ecology (Revised March 2026), potential effects on prey species include temporary habitat disturbance, increased SSC and associated deposition, injury and/or disturbance as a result of underwater noise and vibration, and accidental pollution. These effects are predicted to be highly localised, temporary and recoverable, affecting only a very small proportion of available prey habitat.

6.4.6.104 Grey seals are considered to be opportunistic predators with a broad and flexible diet and are therefore considered to have a low sensitivity to localised or short-term changes in prey availability. The scale and duration of predicted prey impacts are not expected to result in any meaningful reduction in prey availability or accessibility at a scale relevant to the grey seal population associated with Lambay Island SAC.

6.4.6.105 **With consideration of the highly localised and temporary nature of the impacts described above, the generalist foraging strategy of grey seals and wide available foraging habitat, and the distance of the Proposed Development to the SAC (61.89 km), it is therefore concluded there will be no AEoI of the grey seal QI of the Lambay Island SAC, as defined by its COs, as a result of changes in prey resources associated with the construction and decommissioning phases for Project Design Option 1.**

6.4.6.106 **Based on the representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

OPERATIONAL AND MAINTENANCE PHASE ASSESSMENT

6.4.6.107 During the operational and maintenance phase, potential effects on prey species would be limited to intermittent and localised activities such as maintenance dredging or trenching associated with cable or foundation repair. These activities would be infrequent, short-term and spatially restricted when compared to construction and decommissioning works.

6.4.6.108 Any potential effects on prey species during operational and maintenance would be of the same nature as those assessed for the construction phase (including temporary habitat disturbance, localised increases in SSC and accidental pollution), but would occur at a reduced intensity, extent and frequency.

6.4.6.109 As detailed within the construction phase assessment ~~on~~for Blackwater Bank SAC (Section 6.4.1) ~~which is located 19.76 km from the Proposed Development, significantly closer than Lambay Island SAC (62.87 km).~~, predicted impacts on prey species are highly localised, temporary and recoverable, and affect only a very small proportion of available foraging habitat. Given the generalist foraging strategy of grey seals, any short-term or localised changes in prey availability during operation and maintenance would not meaningfully affect foraging success or energetic balance.

6.4.6.110 ~~6.4.3.52 **Therefore, it is**~~**With consideration of the highly localised and temporary nature of the impacts described above, the generalist foraging strategy of grey seals and wide available foraging habitat, and the distance of the Proposed Development to the SAC (61.89 km), it is therefore concluded ~~that~~ there ~~is~~will be no AEoI ~~upon the integrity of~~of the grey seal QI of the Lambay Island SAC, as defined by ~~the~~its COs ~~of the site, from~~, as a result of changes in prey ~~impacting grey seal from~~resources associated with the operational and maintenance phases for Project Design Option 1 ~~in this phase~~.**

6.4.6.111 ~~6.4.3.53~~ **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it ~~can be reasonably assumed that the same conclusion of~~is concluded that no AEoI would also apply to Project Design Option 2.**

ACCIDENTAL POLLUTION

6.4.6.112 ~~6.4.3.54~~ There is ~~the~~ potential for an accidental release of pollutants ~~to occur~~ from vessels and equipment associated with the construction, operational and maintenance, and decommissioning phases of the Proposed Development~~, which may result in adverse effects on marine mammals~~. Pollutants may include diesel fuel, bentonite (from drilling activities), lubricants, grease and oils, anti-fouling biocides, and grout.

6.4.6.113 ~~6.4.3.55~~ In the event of an accidental spill, ~~given the density and distribution of marine mammals in the Marine Mammal Study Area, it is possible that individuals could come into contact with~~grey seals could be exposed to contaminants~~.~~

~~6.4.3.56~~ through either direct or indirect pathways. ~~Direct impacts include ingestion, inhalation, and absorption. All of which may result in physiological responses with health and long-term survival and/or reproduction consequences, the most serious of which could be damage to the respiratory system (Helm *et al.*, 2015).~~

~~6.4.3.57 Indirect impacts include short- and long-term reductions in food availability, disruption to social bonds, reduced reproduction, and/or cumulative effects on individuals, populations, and the ecosystem (Helm *et al.*, 2015).~~

~~6.4.3.58~~ Grey seals are reliant on terrestrial haul-out sites for resting, moulting, and breeding which makes them particularly vulnerable to the effects of pollution should pollution reach their coastal habitats. Seals have been shown to develop conjunctivitis, corneal abrasion, and swollen eyelid membranes in response to exposure to crude oil (Geraci and St. Aubin, 1980). While external oiling is not expected to significantly impact the ability of adult seals to maintain their core body temperature as they rely on blubber for insulation, seal pups entering the water could be vulnerable as oil residues can reduce the thermal properties of neonate animals, increasing their susceptibility to hypothermia (Helm *et al.,* 2015)~~,~~.

~~6.4.3.59 Overall, accidental pollution has the potential to cause LSE on grey seal features.~~

CONSTRUCTION AND DECOMMISSIONING PHASE ASSESSMENT

6.4.6.114 ~~6.4.3.60~~ The installation and removal of ~~the~~ offshore infrastructure for the Proposed Development may lead to the accidental release of pollutants through spills and leaks from vessels and equipment~~. The project design parameters for Project Design Option 1 during the construction phase are~~, as outlined in Table 6.8 ~~and include the installation of 56 WTGs, two OSPs, between 110 and 122 km of inter-array cables, between 25 and 28 km of interconnector cables, and between 35 and 40 km offshore export cables. There will also be up to 4,150 vessel round trips and 294 helicopter round trips during the construction phase (including activities at the landfall site).~~

~~6.4.3.61~~ . ~~The~~ Potential ~~impact to marine mammals from accidental pollution~~impacts during the decommissioning phase ~~is~~are expected to be ~~the same~~similar to, or less than, those during the construction phase.

6.4.6.115 ~~6.4.3.62~~ The magnitude of ~~the impact of~~any accidental pollution ~~will be dependent on the quantities of potential pollutants carried by construction vessels and within equipment.~~event would depend on the type and quantity of material released, with the release of ~~a large inventory of~~ fuel ~~oil~~ from a construction vessel ~~is, however,~~ considered to represent the ~~greatest potential accidental pollution event~~largest credible spill scenario from installation activities. In the event of an accidental spill from vessels, equipment or from construction activities, ~~the spill~~pollutants would be subject to immediate dilution and rapid ~~dispersal~~dispersion within the marine environment (Marappan *et al.,* 2022).

~~6.4.3.63 Considering avoidance through design and management (see~~ Table 6.7~~), the likelihood of accidental release is considered extremely low. The measures in the EMP include storage of chemicals in secure designated areas on vessels in line with appropriate regulations and guidelines, and double skinning of any tanks and pipes containing hazardous substances. All chemicals used will be subject to a chemical risk assessment to ensure risks are understood and minimised. The EMP also includes a MPCP which will contain key emergency contact details and response procedures in the event of a spill of any magnitude to ensure minimal impact. Complying with these procedures will also reduce the magnitude of any spill. Adherence to the avoidance design and management measures outlined in~~ Table 6.7~~,~~

~~including the EMP and MPCP will significantly reduce the likelihood of an accidental pollution incident occurring, and the magnitude of its impact.~~

6.4.6.116 The likelihood of accidental pollution is considered extremely low due to avoidance through design and management measures (Table 6.7). These include the secure storage and handling of chemicals and hazardous material, double-skinned tanks and pipework where appropriate, chemical risk assessments, and the implementation of an EMP and MPCP. The MPCP sets out emergency response procedures to minimise the scale and duration of any spill should one occur.

6.4.6.117 ~~6.4.3.64~~ **Given the inherent low likelihood of an accidental pollution event from vessel activity and other activities, ~~as well as the proposed avoidance/ impacts reduction~~the highly localised nature of any potential exposure, and the mitigation measures (as set out in Table 6.7), it is therefore concluded there ~~is~~will be no ~~potential for~~ AEoI ~~from accidental pollution on~~of the grey seal QI of the Lambay Island SAC, as defined by ~~the~~its COs ~~of the site, impacting grey seal from~~, as a result of accidental pollution associated with the construction and decommissioning phase for Project Design Option 1.**

6.4.6.118 ~~6.4.3.65~~ **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

OPERATIONAL AND MAINTENANCE PHASE ASSESSMENT

6.4.6.119 ~~6.4.3.66 There is the~~During the operational and maintenance phase, there remains a potential for ~~the~~ accidental release of pollutants ~~during this phase of the Proposed Development~~ as a result of the presence of offshore infrastructure, associated equipment, and vessel movements~~. The project design parameters for Project Design Option 1 during the operational and maintenance phase are outlined in~~ Table 6.8~~. This includes synthetic compound, for example from antifouling biocides, heavy metal, and hydrocarbon contamination as a result of the presence of 56 WTGs and two OSPs as well as from maintenance activities. There will also be up to 1,294 vessel round trips and 485 helicopter round trips per year during this phase of the proposed development.~~ (Table 6.8).

6.4.6.120 ~~6.4.3.67 The assessment for this phase is the same as~~The potential pathways, likelihood and consequences of accidental pollution during this phase are consistent with those assessed for the construction phase~~, with~~. The same avoidance ~~by~~through design and management measures ~~being implemented to reduce the risk to negligible levels (see~~, including the EMP and MPCP (Table 6.7 ~~and Section 0).~~), will be implemented throughout operation and maintenance of the Proposed Development.

6.4.6.121 **It is therefore concluded that ~~the potential for AEoI upon the integrity of~~there will be no AEoI of the grey seal QI of the Lambay Island SAC, as defined by ~~the~~its COs ~~of the site, from~~, as a result of accidental pollution ~~impacting grey seal from~~associated with the operational and maintenance phase for Project Design Option 1 ~~is entirely negligible~~.**

6.4.6.122 ~~6.4.3.68~~ **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

Harbour porpoise

~~6.4.3.69 The conservation objectives for harbour porpoise at this designated site have yet to be provided as this has only recently been designated as a site with harbour porpoise as a qualifying interest. Therefore, on a precautionary basis, we will be basing our assessment on the conservation objectives for Rockabill and Dalkey Island SAC as it is the next closest designated site with the same qualifying feature of harbour porpoise. The conservation objectives are to maintain the favourable conservation condition of the feature, how this is defined is presented in Table 5.1.~~

6.4.6.123 The relevant Annex II marine mammal QI site-specific COs at Lambay Island SAC is to is to maintain the favourable conservation condition of the harbour porpoise QI, as defined by the list of attributes and targets set out in Table 5.1 (NPWS, 2024b).

6.4.6.124 ~~6.4.3.70~~ There are ~~five key~~eight potential ~~impacts on~~impact pathways relevant to harbour porpoise associated with the construction, operational~~,~~ and maintenance, and decommissioning of the Proposed Development~~, which are presented in~~ Table 6.8 ~~and are assessed below for each phase of~~ (Table 6.8). These pathways have been assessed in detail for Blackwater Bank SAC which is also designated for the same Annex II marine mammal QI and is located approximately 19.13 km from the Proposed Development, compared to approximately 61.89 km for Lambay Island SAC.

~~6.4.3.71 With consideration that the impact severity is based on distance from the site of works, Blackwater Bank SAC (19.76 km) is designated for the same QIs as Lambay Island SAC (62.87 km) and is located nearer to the Proposed Development, it was concluded that the potential for AEoI is the same or reduced for this site. In Section 6.4.1 it has been concluded that none of the potential effects on harbour porpoise would result in an AEoI of the QIs.~~

6.4.6.125 As the severity and likelihood of all relevant impact pathways are intrinsically distance-dependent, with the spatial extent of predicted effects of the proposed activities decreasing within increasing distance from the Proposed Development. Therefore, as Blackwater Bank SAC represents the closest designated site for harbour porpoise from the Proposed Development, the assessment presented in Section 6.4.1 provides a conservative proxy for the assessment against Lambay Island SAC. This assessment concluded that none of the identified impact pathways would result in an AEoI of Blackwater Bank SAC, with respect to the harbour porpoise QI.

6.4.6.126 ~~6.4.3.72 **Therefore,**~~Given that Lambay Island SAC supports the same Annex II marine mammal QI and lies substantially further from the Proposed Development, the magnitude of effects at Lambay Island SAC is concluded to be no greater than, and in practice less than, those assessed for Blackwater Bank SAC**. It is therefore concluded that** there **~~is~~will be** no AEoI **~~for~~of the harbour porpoise QI of the** Lambay Island SAC, as defined by **~~the~~its** COs **~~of the site~~**, as a result of any of the impacts considered **~~above affecting harbour porpoise from~~for** Project Design Option 1 **~~in this~~across any** phase.

~~6.4.3.73 **Based on the increased risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**~~

~~6.4.4 Codling Fault Zone SAC~~

~~Harbour Porpoise~~

~~6.4.4.1 The conservation objectives for harbour porpoise at this designated site have yet to be provided as this has only recently been designated as a site with harbour porpoise as a qualifying interest. Therefore, on a precautionary basis, we will be basing our assessment on the conservation objectives for West Wales Marine SAC as it is the next closest designated site with the same qualifying feature of harbour porpoise. The conservation objectives are to maintain the favourable conservation condition of the feature, how this is defined is presented in Table 5.1.~~

~~6.4.4.2 There are five key potential impacts on harbour porpoise associated with the construction, operational, and maintenance, and decommissioning of the Proposed Development, which are presented in~~ Table 6.8 ~~and are assessed below for each phase of the Proposed Development. These comprise of Injury and/ or disturbance from underwater noise caused by piling and construction activities, Injury and/ or disturbance caused by vessel movements, Changes in prey, Changes in EMF and Accidental Pollution.~~

6.4.4.3 With consideration that the impact severity is based on distance from the site of works, Blackwater Bank SAC (19.76 km) is designated for the same QIs as Codling Fault Zone SAC (63.31 km) and is located nearer to the Proposed Development, it was concluded that the potential for AEoI is the same or reduced for this site. In Section 0 it has been concluded that none of the potential effects on harbour porpoise would result in an AEoI of the QIs.

6.4.4.4 **Therefore, there is no AEoI for Codling Fault Zone SAC, as defined by the COs of the site, as a result of any of the impacts considered above affecting harbour porpoise from Project Design Option 1 in this phase.**

6.4.4.5 **Based on the increased risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

6.4.5 Rockabill to Dalkey Island SAC

Harbour Porpoise

6.4.5.1 The conservation objectives for harbour porpoise at this designated site is to maintain the favourable conservation condition of the feature, how this is defined is presented in Table 5.1.

6.4.5.2 There are five key potential impacts on harbour porpoise associated with the construction, operational, and maintenance, and decommissioning of the Proposed Development, which are presented in Table 6.8 and are assessed below for each phase of the Proposed Development. These comprise of Injury and/ or disturbance from underwater noise caused by piling and construction activities, Injury and/ or disturbance caused by vessel movements, Changes in prey, Changes in EMF and Accidental Pollution.

6.4.5.3 With consideration that the impact severity is based on distance from the site of works, Blackwater Bank SAC (19.76 km) is designated for the same QIs as Rockabill to Dalkey Island SAC (70.39 km) and is located nearer to the Proposed Development, it was concluded that the potential for AEoI is the same or reduced for this site. In Section 0 it has been concluded that none of the potential effects on harbour porpoise would result in an AEoI of the QIs.

6.4.5.4 **Therefore, there is no AEoI for Rockabill to Dalkey Island SAC, as defined by the COs of the site, as a result of any of the impacts considered above affecting harbour porpoise from Project Design Option 1 in this phase.**

6.4.5.5 **Based on the increased risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

6.4.6 Carnsore Point SAC

Harbour Porpoise

6.4.6.1 The conservation objectives for harbour porpoise at this designated site have yet to be provided as this has only recently been designated as a site with harbour porpoise as a qualifying interest. Therefore, on a precautionary basis, we will be basing our assessment on the conservation objectives for Rockabill and Dalkey Island SAC as it is the next closest designated site with the same qualifying feature of harbour porpoise. The conservation objectives are to maintain the favourable conservation condition of the feature, how this is defined is presented in Table 5.1.

6.4.6.2 There are five key potential impacts on harbour porpoise associated with the construction, operational, and maintenance, and decommissioning of the Proposed Development, which are presented in Table 6.8 and are assessed below for each phase of the Proposed Development. These comprise of Injury and/ or disturbance from underwater noise caused by piling and construction activities, Injury and/ or disturbance caused by vessel movements, Changes in prey, Changes in EMF and Accidental Pollution.

~~6.4.6.3 With consideration that the impact severity is based on distance from the site of works, Blackwater Bank SAC (19.76 km) is designated for the same QIs as Carnsore Point SAC (73.83 km) and is located nearer to the Proposed Development, it was concluded that the potential for AEoI is the same or reduced for this site. In Section 0 it has been concluded that none of the potential effects on harbour porpoise would result in an AEoI of the QIs.~~

~~6.4.6.4 **Therefore, there is no AEoI for Carnsore Point SAC, as defined by the COs of the site, as a result of any of the impacts considered above affecting harbour porpoise from Project Design Option 1 in this phase.**~~

6.4.6.127 ~~6.4.6.5~~ **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

6.4.7 Saltee Islands SAC

Grey seal

~~6.4.7.1 The conservation objectives for grey seal at this designated site is to maintain the favourable conservation condition of the feature, how this is defined is presented in Table 5.1.~~

6.4.7.1 The relevant Annex II marine mammal QI site-specific COs at Saltee Islands SAC is to maintain the favourable conservation condition of the grey seal, as defined by the list of attributes and targets set out in Table 5.1 (NPWS, 2011b).

6.4.7.2 ~~There are four key~~Seven potential ~~impacts on~~impact pathways relevant to grey seal ~~associated with~~have been identified in relation to the construction, ~~operational~~operation and maintenance, and decommissioning of the Proposed Development~~, which are presented in~~ Table 6.8 ~~and are assessed below for each phase of~~ (Table 6.8). These pathways have been assessed in detail for Lambay Island SAC, which is designated for the same Annex II marine mammal QI, and is located approximately 61.89 km from the Proposed Development~~. These comprise of Injury and/ or disturbance from underwater noise caused by piling and construction activities, Injury and/ or disturbance caused by vessel movements, Changes in prey and Accidental Pollution.~~, compared to approximately 93.38 km for Saltee Islands SAC.

~~6.4.7.3 With consideration that the impact severity is based on distance from the site of works, Lambay Island SAC (62.87 km) is designated for the same QIs as Saltee Islands SAC (90.70 km) and is located nearer to the Proposed Development, it was concluded that the potential for AEoI is the same or reduced for this site. In Section 6.4.6 it has been concluded that none of the potential effects on grey seal would result in an AEoI of the QIs.~~

6.4.7.3 As the severity and likelihood of all relevant impact pathways are intrinsically distance-dependent, Lambay Island SAC represents the closest designated site for grey seal from the Proposed Development. The assessment presented in Section 6.4.5 therefore provides a conservative basis for evaluation and concluded that none of the identified impact pathways would result in an AEoI of Lambay Island SAC, with respect to the grey seal QI.

6.4.7.4 ~~**Therefore,**~~Given that the Saltee Islands SAC supports the same Annex II marine mammal QI and lies further from the Proposed Development, the magnitude of effects at Saltee Islands SAC is concluded to be no greater than, and in practice less than, those assessed for Lambay Island SAC. **It is therefore concluded that there ~~is~~will be no AEoI ~~for~~of the grey seal QI of the Saltee Islands SAC, as defined by ~~the~~its COs ~~of the site~~, as a result of any of the impacts considered ~~above affecting grey seal from~~for Project Design Option 1 ~~in this~~across any phase.**

6.4.7.5 **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

6.4.8 Hook Head SAC

Harbour porpoise

~~6.4.8.1 The conservation objectives for harbour porpoise at this designated site have yet to be provided as this has only recently been designated as a site with harbour porpoise as a qualifying interest. Therefore, on a precautionary basis, we will be basing our assessment on the conservation objectives for West Wales Marine SAC as it is the next closest designated site with the same qualifying feature of harbour porpoise. The conservation objectives are to maintain the favourable conservation condition of the feature, how this is defined is presented in Table 5.1.~~

6.4.8.1 The relevant Annex II marine mammal QI site-specific COs at Hook Head SAC is to maintain the favourable conservation condition of the harbour porpoise QI, as defined by the list of attributes and targets set out in Table 5.1 (NPWS, 2025c).

6.4.8.2 ~~There are five key~~Eight potential ~~impacts on~~impact pathways relevant to harbour porpoise ~~associated with~~have been identified in relation to the construction, ~~operational, and~~operation and maintenance, and decommissioning of the Proposed Development~~, which are presented in~~ Table 6.8 ~~and are assessed below for each phase of~~ (Table 6.8). These pathways have been assessed in detail for Blackwater Bank SAC which is also designated for the same Annex II marine mammal QI and is located approximately 19.13 km from the Proposed Development~~. These comprise of Injury and/ or disturbance from underwater noise caused by piling and construction activities, Injury and/ or disturbance caused by vessel movements, Changes in prey, Changes in EMF and accidental pollution.~~, compared to approximately 112.61 km for Hook Head SAC.

~~6.4.8.3 With consideration that the impact severity is based on distance from the site of works, Blackwater Bank SAC (19.76 km) is designated for the same QIs as Hook Head SAC (109.96 km) and is located nearer to the Proposed Development, it was concluded that the potential for AEoI is the same or reduced for this site. In Section 0, it has been concluded that none of the potential effects on harbour porpoise would result in an AEoI of the QIs.~~

6.4.8.3 As the severity and likelihood of all relevant impact pathways are intrinsically distance-dependent, Blackwater Bank SAC represents the closest designated site for harbour porpoise from the Proposed Development. The assessment presented in Section 6.4.1 therefore provides a conservative basis for evaluation and concluded that none of the identified impact pathways would result in an AEoI of Blackwater Bank SAC, with respect to the harbour porpoise QI.

6.4.8.4 ~~**Therefore,**~~Given that Hook Head SAC supports the same Annex II marine mammal QI and lies substantially further from the Proposed Development, the magnitude of effects at Hook Head SAC is concluded to be no greater than, and in practice less than, those assessed for Blackwater Bank SAC. **It is therefore concluded that there ~~is~~will be no AEoI ~~for~~of the harbour porpoise QI of the Hook Head SAC, as defined by ~~the~~its COs ~~of the site~~, as a result of any of the impacts considered ~~above affecting harbour porpoise from~~for Project Design Option 1 ~~in this~~across any phase.**

6.4.8.5 **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

Bottlenose dolphin

~~6.4.8.6 The conservation objectives for bottlenose dolphin at this designated site have yet to be provided as this has only recently been designated as a site with bottlenose dolphin as a qualifying interest. Therefore, on a precautionary basis, we will be basing our assessment on the conservation objectives for Lleyn Peninsula and the Sarnau/ Pen Llyn a'r Sarnau SAC as it is the next closest designated site with the same qualifying feature of bottlenose dolphin. The~~

~~conservation objectives are to maintain the favourable conservation condition of the feature, how this is defined is presented in Table 5.1.~~

6.4.8.6 The relevant Annex II marine mammal QI site-specific COs at Hook Head SAC is to maintain the favourable conservation condition of the bottlenose dolphin, as defined by the list of attributes and targets set out in Table 5.1 (NPWS, 2025c).

6.4.8.7 ~~There are five key~~Eight potential ~~impacts on~~impact pathways relevant to bottlenose dolphin ~~associated with~~have been identified in relation to the construction, ~~operational, and~~operation and maintenance, and decommissioning of the Proposed Development~~, which are presented in Table 6.8 and are assessed below for each phase of~~ (Table 6.8). These pathways have been assessed in detail for Lleyn Peninsula and the Sarnau SAC, which is also designated for the same Annex II marine mammal QI and is located approximately 71.35 km from the Proposed Development~~. These comprise of Injury and/ or disturbance from underwater noise caused by piling and construction activities, Injury and/ or disturbance caused by vessel movements, Changes in prey, Changes in EMF and Accidental Pollution.~~, compared to approximately 112.61 km for Hook Head SAC.

6.4.8.8 Whilst the detailed assessment has been undertaken for the Lleyn Peninsula and the Sarnau SAC, the assessment is applicable to the Hook Head SAC due to the overlap between the COs. The COs for Lleyn Peninsula and the Sarnau SAC (Table 5.1) include Target 2a under Objective 2 that aligns with Target 1 of Hook Head SAC, that the species range within the site should not be restricted by artificial barriers to site use. The COs for Lleyn Peninsula and the Sarnau SAC also comprise several attributes and targets (under Objectives 1 and 2) that align with Target 2 of Hook Head SAC, that human activities should occur at levels that do not adversely affect the bottlenose dolphin population at the site.

6.4.8.9 ~~6.4.8.8 With consideration that the impact severity is based on distance from the site of works~~As the severity and likelihood of all relevant impact pathways are intrinsically distance-dependent, Lleyn Peninsula and the Sarnau~~/ Pen Llyn a'r Sarnau SAC (73.32 km) is~~ SAC represents the closest designated site for ~~the same QIs as Hook Head (109.96 km) and is located nearer to~~bottlenose dolphin from the Proposed Development~~, it was concluded that the potential for AEoI is the same or reduced for this site.~~. The assessment presented in Section 6.4.18 ~~it has been~~therefore provides a conservative basis for evaluation and concluded that none of the ~~potential effects on bottlenose dolphin~~identified impact pathways would result in an AEoI of ~~the QIs~~Lleyn Peninsula and the Sarnau SAC with respect to the bottlenose dolphin QI.

~~6.4.8.9 **Therefore, there is no AEoI for Hook Head SAC, as defined by the COs of the site, as a result of any of the impacts considered above affecting bottlenose dolphin from Project Design Option 1 in this phase.**~~

6.4.8.10 Given that the Lleyn Peninsula and the Sarnau SAC supports the same Annex II marine mammal QI and lies further from the Proposed Development, the magnitude of effects at Lleyn Peninsula and the Sarnau SAC is concluded to no greater than, and in practice less than, those associated for Lleyn Peninsula and the Sarnau SAC**. It is therefore concluded that there will be no AEoI of the bottlenose dolphin QI of the Hook Head SAC, as defined by its COs, as a result of any of the impacts considered for Project Design Option 1 across any phase.**

6.4.8.11 ~~6.4.8.10~~ **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

6.4.9 Roaringwater Bay and Islands SAC

Harbour porpoise

~~6.4.9.1 The conservation objectives for harbour porpoise at this designated site is to maintain the favourable conservation condition of the feature, how this is defined is presented in Table 5.1.~~

6.4.9.1 The relevant Annex II marine mammal QI site-specific COs at Roaringwater Bay and Islands SAC is to maintain the favourable conservation condition of the harbour porpoise QI, as defined by the list of attributes and targets set out in Table 5.1 (NPWS, 2011d).

6.4.9.2 ~~There are five key~~Eight potential ~~impacts on~~impact pathways relevant to harbour porpoise ~~associated with~~have been identified in relation to the construction, ~~operational, and~~operation and maintenance, and decommissioning of the Proposed Development~~, which are presented in~~ Table 6.8 ~~and are assessed below for each phase of~~ (Table 6.8). These pathways have been assessed in detail for Blackwater Bank SAC which is also designated for the same Annex II marine mammal QI and is located approximately 19.13 km from the Proposed Development~~. These comprise of Injury and/ or disturbance from underwater noise caused by piling and construction activities, Injury and/ or disturbance caused by vessel movements, Changes in prey, Changes in EMF and Accidental Pollution.~~, compared to approximately 317.71 km for Roaringwater Bay and Islands SAC.

6.4.9.3 As the severity and likelihood of all relevant impact pathways are intrinsically distance-dependent, Blackwater Bank SAC represents the closest designated site for harbour porpoise in relation to the Proposed Development. The assessment presented in Section 6.4.1 therefore provides a conservative basis for evaluation and concluded that none of the identified impact pathways would result in an AEoI of Blackwater Bank SAC, with respect to the harbour porpoise QI.

6.4.9.4 ~~6.4.9.3 With consideration that the impact severity is based on distance from the site of works, Blackwater Bank SAC (19.76 km) is designated for the same QIs as~~Given that Roaringwater Bay and Islands SAC ~~(310.71 km via marine pathway) and is located nearer to~~supports the same Annex II marine mammal QI and lies substantially further from the Proposed Development, ~~it was concluded that the potential for AEoI is the same or reduced for this site. In Section 0 it has been concluded that none of the potential effects on harbour porpoise would result in an AEoI of the QIs.~~

~~6.4.9.4~~ the magnitude of effects at Roaringwater Bay and Islands SAC is concluded to be no greater than, and in practice less than, those assessed for Blackwater Bank SAC. **It is therefore concluded that there will be no AEoI of the harbour porpoise QI of the ~~Therefore, there is no AEoI for~~ Roaringwater Bay and Islands SAC, as defined by ~~the~~its COs ~~of the site~~, as a result of any of the impacts considered ~~above affecting harbour porpoise from~~for Project Design Option 1 ~~in this~~across any phase.**

6.4.9.5 **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

6.4.10 Kenmare River SAC

Harbour porpoise

~~6.4.10.1 The conservation objectives for harbour porpoise at this designated site have yet to be provided as this has only recently been designated as a site with harbour porpoise as a qualifying interest. Therefore, on a precautionary basis, we will be basing our assessment on the conservation objectives for Blasket Islands SAC as it is the next closest designated site with the same qualifying feature of harbour porpoise. The conservation objectives are to maintain the favourable conservation condition of the feature, how this is defined is presented in Table 5.1.~~

6.4.10.1 The relevant Annex II marine mammal QI site-specific COs at Kenmare River SAC is to maintain the favourable conservation condition of the harbour porpoise QI, as defined by the list of attributes and targets set out in Table 5.1 (NPWS, 2026a).

6.4.10.2 ~~There are five key~~Eight potential ~~impacts on~~impact pathways relevant to harbour porpoise ~~associated with~~have been identified in relation to the construction, ~~operational, and~~operation and maintenance, and decommissioning of the Proposed Development~~, which are presented in~~ Table 6.8 ~~and are assessed below for each phase of~~ (Table 6.8). These pathways have been assessed in detail for Blackwater Bank SAC which is also designated for the same Annex II marine mammal QI and is located approximately 19.13 km from the Proposed Development~~. These comprise of Injury and/ or disturbance from underwater noise caused by piling and construction activities, Injury and/ or disturbance caused by vessel movements, Changes in prey, Changes in EMF and Accidental Pollution.~~, compared to approximately 374.31 km for Kenmare River SAC.

~~6.4.10.3 With consideration that the impact severity is based on distance from the site of works, Blackwater Bank SAC (19.76 km) is designated for the same QIs as, Kenmare River SAC (371.44 km) and is located nearer to the Proposed Development, it was concluded that the potential for AEoI is the same or reduced for this site. In Section 0 it has been concluded that none of the potential effects on harbour porpoise would result in an AEoI of the QIs.~~

6.4.10.3 As the severity and likelihood of all relevant impact pathways are intrinsically distance-dependent, Blackwater Bank SAC represents the closest designated site for harbour porpoise from the Proposed Development. The assessment presented in Section 6.4.1 therefore provides a conservative basis for evaluation and concluded that none of the identified impact pathways would result in an AEoI of Blackwater Bank SAC, with respect to the harbour porpoise QI.

6.4.10.4 ~~**Therefore,**~~Given that the Kenmare River SAC supports the same Annex II marine mammal QI and lies substantially further from the Proposed Development, the magnitude of any potential effects at Kenmare River SAC is concluded to be no greater than, and in practice less than, those assessed for Blackwater Bank SAC. **It is therefore concluded that there ~~is~~will be no AEoI ~~for~~of the harbour porpoise QI of the Kenmare River SAC, as defined by ~~the~~its COs ~~of the site~~, as a result of any of the impacts considered ~~above affecting harbour porpoise from~~for Project Design Option 1 ~~in this~~across any phase.**

6.4.10.5 **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

6.4.11 Blasket Islands SAC

Harbour porpoise

~~6.4.11.1 The conservation objectives for harbour porpoise at this designated site is to maintain the favourable conservation condition of the feature, how this is defined is presented in Table 5.1.~~

6.4.11.1 The relevant Annex II marine mammal QI site-specific COs at Blasket Island SAC is to maintain the favourable conservation condition of the harbour porpoise QI, as defined by the list of attributes and targets set out in Table 5.1 (NPWS, 2014).

6.4.11.2 ~~There are five key~~Eight potential ~~impacts on~~impact pathways relevant to harbour porpoise ~~associated with~~have been identified in relation to the construction, ~~operational, and~~operation and maintenance, and decommissioning of the Proposed Development~~, which are presented in Table 6.8 and are assessed below for each phase of~~ (Table 6.8). These pathways have been assessed in detail for Blackwater Bank SAC which is also designated for the same Annex II marine mammal QI and is located approximately 19.13 km from the Proposed Development~~. These comprise of Injury and/ or disturbance from underwater noise caused by piling and construction activities, Injury and/ or disturbance caused by vessel movements, Changes in~~

~~prey, Changes in EMF and Accidental Pollution.~~, compared to approximately 428.43 km for Blasket Islands SAC.

~~6.4.11.3 With consideration that the impact severity is based on distance from the site of works, Blackwater Bank SAC (19.76 km) is designated for the same QIs as Blasket Islands SAC (425.35 km) and is located nearer to the Proposed Development, it was concluded that the potential for AEoI is the same or reduced for this site. In Section 0, it has been concluded that none of the potential effects on harbour porpoise would result in an AEoI of the QIs.~~

6.4.11.3 As the severity and likelihood of all relevant impact pathways are intrinsically distance-dependent, Blackwater Bank SAC represents the closest designated site for harbour porpoise from the Proposed Development. The assessment presented in Section 6.4.1 provides a therefore conservative basis for evaluation and concluded that none of the identified impact pathways would result in an AEoI of Blackwater Bank SAC, with respect to the harbour porpoise QI.

6.4.11.4 ~~**Therefore,**~~Given that the Blasket Islands SAC supports the same Annex II marine mammal QI and lies substantially further from the Proposed Development, the magnitude of effects at the Blasket Islands SAC is concluded to be no greater than, and in practice less than, those associated for Blackwater Bank SAC. **It is therefore concluded that** **there ~~is~~will be no AEoI ~~for~~of the harbour porpoise QI of the Blasket Islands SAC, as defined by ~~the~~its COs ~~of the site~~, as a result of any of the impacts considered ~~above affecting harbour porpoise from~~for Project Design Option 1 ~~in this~~across any phase.**

6.4.11.5 **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

6.4.12 Belgica Mound Province SAC

Harbour porpoise

~~6.4.12.1 The conservation objectives for harbour porpoise at this designated site have yet to be provided as this has only recently been designated as a site with harbour porpoise as a qualifying interest. Therefore, on a precautionary basis, we will be basing our assessment on the conservation objectives for Blasket Islands SAC as it is the next closest designated site with the same qualifying feature of harbour porpoise. The conservation objectives are to maintain the favourable conservation condition of the feature, how this is defined is presented in Table 5.1.~~

6.4.12.1 The relevant Annex II marine mammal QI site-specific COs at Belgica Mound Province SAC is to maintain the favourable conservation condition of the harbour porpoise QI, as defined by the list of attributes and targets set out in Table 5.1 (NPWS, 2025d).

6.4.12.2 ~~There are five key~~Eight potential ~~impacts on~~impact pathways relevant to harbour porpoise ~~associated with~~have been identified in relation to the construction, ~~operational, and~~operation and maintenance, and decommissioning of the Proposed Development~~, which are presented in~~ Table 6.8 ~~and are assessed below for each phase of~~ (Table 6.8). These pathways have been assessed in detail for Blackwater Bank SAC which is also designated for the same Annex II marine mammal QI and is located approximately 19.13 km from the Proposed Development~~. These comprise of Injury and/ or disturbance from underwater noise caused by piling and construction activities, Injury and/ or disturbance caused by vessel movements, Changes in prey, Changes in EMF and Accidental Pollution.~~, compared to approximately 468.39 km for the Belgica Mound Province SAC.

~~6.4.12.3 With consideration that the impact severity is based on distance from the site of works, Blackwater Bank SAC (19.76 km) is designated for the same QIs as Belgica Mound Province SAC (465.83 km) and is located nearer to the Proposed Development, it was concluded that the potential for AEoI is the same or reduced for this site. In Section 6.4.1, it has been~~

~~concluded that none of the potential effects on harbour porpoise would result in an AEoI of the QIs.~~

6.4.12.3 As the severity and likelihood of all relevant impact pathways are intrinsically distance-dependent, Blackwater Bank SAC represents the closest designated site for harbour porpoise from the Proposed Development. The assessment presented in Section 6.4.1 therefore provides a conservative basis for evaluation and concluded that none of the identified impact pathways would result in an AEoI of Blackwater Bank SAC, with respect to the harbour porpoise QI.

6.4.12.4 ~~Therefore,~~Given the Belgica Mound Province SAC supports the same Annex II marine mammal QI and lies substantially further from the Proposed Development, the magnitude of effects at the Belgica Mound Province SAC is concluded to be no greater than, and in practice less than, those associated for Blackwater Bank SAC. **It is therefore concluded that there ~~is~~will be no AEoI ~~for~~of the harbour porpoise QI of the Belgica Mound Province SAC, as defined by ~~the~~its COs ~~of the site~~, as a result of any of the impacts considered ~~above affecting harbour porpoise from~~for Project Design Option 1 ~~in this~~across any phase.**

6.4.12.5 **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

6.4.13 Bunduff Lough and Machair / Trawalua / Mullaghmore SAC

Harbour porpoise

~~6.4.13.1 The conservation objectives for harbour porpoise at this designated site have yet to be provided as this has only recently been designated as a site with harbour porpoise as a qualifying interest. Therefore, on a precautionary basis, we will be basing our assessment on the conservation objectives for Blasket Islands SAC as it is the next closest designated site with the same qualifying feature of harbour porpoise. The conservation objectives are to maintain the favourable conservation condition of the feature, how this is defined is presented in Table 5.1.~~

~~6.4.13.2 There are five key potential impacts on harbour porpoise associated with the construction, operational, and maintenance, and decommissioning of the Proposed Development, which are presented in~~ Table 6.8 ~~and are assessed below for each phase of the Proposed Development. These comprise of Injury and/ or disturbance from underwater noise caused by piling and construction activities, Injury and/ or disturbance caused by vessel movements, Changes in prey, Changes in EMF and Accidental Pollution.~~

~~6.4.13.3 With consideration that the impact severity is based on distance from the site of works, Blackwater Bank SAC (19.76 km) is designated for the same QIs as Bunduff Lough and Machair / Trawalua / Mullaghmore SAC (536.89 km) and is located nearer to the Proposed Development, it was concluded that the potential for AEoI is the same or reduced for this site. In Section 6.4.1, it has been concluded that none of the potential effects on harbour porpoise would result in an AEoI of the QIs.~~

~~6.4.13.4 **Therefore, there is no AEoI for Bunduff Lough and Machair / Trawalua / Mullaghmore SAC, as defined by the COs of the site, as a result of any of the impacts considered above affecting harbour porpoise from Project Design Option 1 in this phase.**~~

6.4.13.1 The site-specific COs for the Annex II harbour porpoise QI at Bunduff Lough and Machair / Trawalua / Mullaghmore SAC have not yet been published, as this feature was only recently added to the site designation in 2024. In the absence of formal site-specific CO attributes and targets, this assessment adopts a precautionary approach, informed by all available documentation relevant to the Bunduff Lough and Machair / Trawalua / Mullaghmore SAC and its Annex II harbour porpoise QI. This includes NPWS site documentation (NPWS, 2015; NPWS, 2024k), the Standard Data Form for the site (EEA, 2025s), and wider scientific and

survey information on harbour porpoise occurrence in the surrounding region. Understanding of likely COs is further informed by the consistent method applied by NPWS in defining COs for harbour porpoise SACs in Ireland.

6.4.13.2 For all harbour porpoise QI SACs for which NPWS has published COs, the overarching objective is to maintain the favourable conservation condition of the species by ensuring continued access to suitable habitat and avoiding disturbance at levels that could adversely affect the harbour porpoise community at the site (Table 5.1; see full detail in Section 6.4.1.1) In the absence of published site-specific COs for the harbour porpoise QI at Bunduff Lough and Machair / Trawalua / Mullaghmore SAC, these attributes and objectives are considered to provide useful context on the potential sensitivities of the harbour porpoise QI. . It is highlighted that these COs are in place for multiple nearby SACs that support the same QI, including Inishmore Island SAC (NPWS, 2024d; Section 6.4.14), West Connact Coast SAC (NPWS, 2025e; Section 6.4.16) and Belgica Mound Province SAC (NPWS, 2025d; Section 6.4.12).

6.4.13.3 Supporting information on harbour porpoise occurrence, distribution and habitat use within the wider regional near to Bunduff Lough and Machair / Trawalua / Mullaghmore SAC has also been included in the assessment. This comprises targeted cetaceans surveys undertaken at nearby SACs, namely West Connacht Coast SAC (Berrow *et al.*, 2021) and Roaringwater Bay and Islands SAC (O'Brien and Berrow, 2015), which provide baseline data on species presence, relative abundance or density, spatial distribution, and indirectly, habitat associations. The Standard Data Form for Bunduff Lough and Machair / Trawalua / Mullaghmore SAC (EEA, 2025s) confirms that harbour porpoise have a permanent presence within the SAC and surrounding waters across all seasons, with groups regularly observed in the SAC and adjacent areas, demonstrating functional use of the site by the species.

6.4.13.4 When considered alongside the wider scientific literature (see Section 6.3.2), these data provide additional context on harbour porpoise habitat use and informs the identification of relevant ecological sensitivities. Key considerations include disturbance from human activities, degradation or loss of suitable habitat, barriers to movement or access to foraging areas, and other pressures documented for the site such as fishing, shipping, pollution, invasive species, and climate related impacts (EEA, 2025s). This combined information supports the assessment of potential impact pathways for Bunduff Lough and Machair / Trawalua / Mullaghmore SAC.

6.4.13.5 Eight potential impact pathways relevant to harbour porpoise have been identified in relation to the construction, operation and maintenance, and decommissioning of the Proposed Development (Table 6.8). These pathways have been assessed in detail for Blackwater Bank SAC which is also designated for the same Annex II marine mammal QI and is located approximately 19.13 km from the Proposed Development, compared to approximately 537.75 km for Bunduff Lough and Machair / Trawalua / Mullaghmore SAC.

6.4.13.6 As the severity and likelihood of all relevant impact pathways are intrinsically distance-dependent, Blackwater Bank SAC represents the closest designated site for harbour porpoise from the Proposed Development. The assessment presented in Section 6.4.1 therefore provides a conservative basis for evaluation and concluded that none of the identified impact pathways would result in an AEoI of Blackwater Bank SAC, with respect to the harbour porpoise QI.

6.4.13.7 Given that Bunduff Lough and Machair / Trawalua / Mullaghmore SAC supports the same Annex II marine mammal QI and lies substantially further from the Proposed Development, the magnitude of effects at Bunduff Lough and Machair / Trawalua / Mullaghmore SAC is concluded to be no greater, and in practice less than, those assumed for Blackwater Bank SAC. There is therefore no pathway by which the Proposed Development could restrict access to suitable habitat within the Bunduff Lough and Machair / Trawalua / Mullaghmore SAC or result in disturbance at levels capable of adversely affecting harbour porpoise using the SAC.

It is therefore concluded that there will be no AEoI of the harbour porpoise QI of the Bunduff Lough and Machair / Trawalua / Mullaghmore SAC, as a result of any of the impacts considered for Project Design Option 1 across any phase.

6.4.13.8 ~~6.4.13.5~~ **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

6.4.14 Inishmore Island SAC

Harbour porpoise

~~6.4.14.1 The conservation objectives for harbour porpoise at this designated site have yet to be provided as this has only recently been designated as a site with harbour porpoise as a qualifying interest. Therefore, on a precautionary basis, we will be basing our assessment on the conservation objectives for Blasket Islands SAC as it is the next closest designated site with the same qualifying feature of harbour porpoise. The conservation objectives are to maintain the favourable conservation condition of the feature, how this is defined is presented in Table 5.1.~~

6.4.14.1 The relevant Annex II marine mammal QI site-specific COs at Inishmore Island SAC is to maintain the favourable conservation condition of the harbour porpoise QI, as defined by the list of attributes and targets set out in Table 5.1 (NPWS, 2024d).

6.4.14.2 ~~There are five key~~Eight potential ~~impacts on~~impact pathways relevant to harbour porpoise ~~associated with~~have been identified in relation to the construction, ~~operational, and~~operation and maintenance, and decommissioning of the Proposed Development~~, which are presented in~~ Table 6.8 ~~and are assessed below for each phase of~~ (Table 6.8). These pathways have been assessed in detail for Blackwater Bank SAC which is also designated for the same Annex II marine mammal QI and is located approximately 19.13 km from the Proposed Development~~. These comprise of Injury and/ or disturbance from underwater noise caused by piling and construction activities, Injury and/ or disturbance caused by vessel movements, Changes in prey, Changes in EMF and Accidental Pollution.~~, compared to approximately 552.21 km for Inishmore Island SAC.

~~6.4.14.3 With consideration that the impact severity is based on distance from the site of works, Blackwater Bank SAC (19.76 km) is designated for the same QIs as Inishmore Island SAC (549.28 km) and is located nearer to the Proposed Development, it was concluded that the potential for AEoI is the same or reduced for this site. In Section 6.4.1, it has been concluded that none of the potential effects on harbour porpoise would result in an AEoI of the QIs.~~

6.4.14.3 As the severity and likelihood of all relevant impact pathways are intrinsically distance-dependent, Blackwater Bank SAC represents the closest designated site for harbour porpoise from the Proposed Development. The assessment presented in Section 6.4.1 therefore provides a conservative basis for evaluation and concluded that none of the identified impact pathways would result in an AEoI of Blackwater Bank SAC, with respect to the harbour porpoise QI.

6.4.14.4 ~~Therefore,~~Given that Inishmore Island SAC supports the same Annex II marine mammal QI and lies substantially further from the Proposed Development, the magnitude of effects at Inishmore Island SAC is concluded to be no greater than, and in practice less than, those assessed for Blackwater Bank SAC. **It is therefore concluded that there ~~is~~will be no AEoI ~~for~~of the harbour porpoise QI of the Inishmore Island SAC, as defined by ~~the~~its COs ~~of the site~~, as a result of any of the impacts considered ~~above affecting harbour porpoise from~~for Project Design Option 1 across any phase.**

6.4.14.5 **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

6.4.15 Kilkieran Bay and Islands SAC

Harbour porpoise

~~6.4.15.1 The conservation objectives for harbour porpoise at this designated site have yet to be provided as this has only recently been designated as a site with harbour porpoise as a qualifying interest. Therefore, on a precautionary basis, we will be basing our assessment on the conservation objectives for Blasket Islands SAC as it is the next closest designated site with the same qualifying feature of harbour porpoise. The conservation objectives are to maintain the favourable conservation condition of the feature, how this is defined is presented in Table 5.1.~~

6.4.15.1 The relevant Annex II marine mammal QI site-specific COs at Kilkieran Bay and Islands SAC is to maintain the favourable conservation condition of the harbour porpoise QI, as defined by the list of attributes and targets set out in Table 5.1 (NPWS, 2026b).

6.4.15.2 ~~There are five key~~Eight potential ~~impacts on~~impact pathways relevant to harbour porpoise ~~associated with~~have been identified in relation to the construction, ~~operational, and~~operation and maintenance, and decommissioning of the Proposed Development~~, which are presented in~~ Table 6.8 ~~and are assessed below for each phase of~~ (Table 6.8). These pathways have been assessed in detail for Blackwater Bank SAC which is also designated for the same Annex II marine mammal QI and is located approximately 19.13 km from the Proposed Development~~. These comprise of Injury and/ or disturbance from underwater noise caused by piling and construction activities, Injury and/ or disturbance caused by vessel movements, Changes in prey, Changes in EMF and Accidental Pollution.~~, compared to approximately 565.64 km from Kilkieran Bay and Islands SAC.

~~6.4.15.3 With consideration that the impact severity is based on distance from the site of works, Blackwater Bank SAC (19.76 km) is designated for the same QIs as Kilkieran Bay and Islands SAC (562.75 km) and is located nearer to the Proposed Development, it was concluded that the potential for AEoI is the same or reduced for this site. In Section 6.4.1, it has been concluded that none of the potential effects on harbour porpoise would result in an AEoI of the QIs.~~

6.4.15.3 As the severity and likelihood of all relevant impact pathways are intrinsically distance-dependent, Blackwater Bank SAC represents the closest designated site for harbour porpoise from the Proposed Development. The assessment presented in Section 6.4.1 therefore provides a conservative basis for evaluation and concluded that none of the identified impact pathways would result in an AEoI of Blackwater Bank SAC, with respect to the harbour porpoise QI.

6.4.15.4 ~~**Therefore,**~~Given that Kilkieran Bay and Islands SAC supports the same Annex II marine mammal QI and lies substantially further from the Proposed Development, the magnitude of effects at Kilkieran Bay and Islands SAC is concluded to be no greater than, and in practice less than, those assessed for Blackwater Bank SAC. **It is therefore concluded that** **there ~~is~~will be no AEoI ~~for~~of the harbour porpoise QI of the Kilkieran Bay and Islands SAC, as defined by ~~the~~its COs ~~of the site~~, as a result of any of the impacts considered ~~above affecting harbour porpoise from~~for Project Design Option 1 across any phase.**

6.4.15.5 **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

6.4.16 West Connacht Coast SAC

Harbour porpoise

~~6.4.16.1 The conservation objectives for harbour porpoise at this designated site have yet to be provided as this has only recently been designated as a site with harbour porpoise as a qualifying interest. Therefore, on a precautionary basis, we will be basing our assessment on the~~

~~conservation objectives for Blasket Islands SAC as it is the next closest designated site with the same qualifying feature of harbour porpoise. The conservation objectives are to maintain the favourable conservation condition of the feature, how this is defined is presented in Table 5.1.~~

6.4.16.1 The relevant Annex II marine mammal QI site-specific CO at West Connacht Coast SAC is to maintain the favourable conservation condition of the harbour porpoise QI, as defined by the list of attributes and targets set out in Table 5.1 (NPWS, 2025e).

6.4.16.2 ~~There are five key~~Eight potential ~~impacts on~~impact pathways relevant to harbour porpoise ~~associated with~~have been identified in relation to the construction, ~~operational, and~~operation and maintenance, and decommissioning of the Proposed Development~~, which are presented in~~ Table 6.8 ~~and are assessed below for each phase of~~ (Table 6.8). These pathways have been assessed in detail for Blackwater Bank SAC which is also designated for the same Annex II marine mammal QI and is located approximately 19.13 km from the Proposed Development~~. These comprise of Injury and/ or disturbance from underwater noise caused by piling and construction activities, Injury and/ or disturbance caused by vessel movements, Changes in prey, Changes in EMF and Accidental Pollution.~~, compared to approximately 608.16 km for West Connacht Coast SAC.

~~6.4.16.3 With consideration that the impact severity is based on distance from the site of works, Blackwater Bank SAC (19.76 km) is designated for the same QIs as West Connacht Coast SAC (605.46 km) and is located nearer to the Proposed Development, it was concluded that the potential for AEoI is the same or reduced for this site. In Section 6.4.1, it has been concluded that none of the potential effects on harbour porpoise would result in an AEoI of the QIs.~~

6.4.16.3 As the severity and likelihood of all relevant impact pathways are intrinsically distance-dependent, Blackwater Bank SAC represents the closest designated site for harbour porpoise from the Proposed Development. The assessment presented in Section 6.4.1 provides a conservative basis for evaluation and concluded that none of the identified impact pathways would result in an AEoI of Blackwater Bank SAC, with respect to the harbour porpoise QI.

6.4.16.4 ~~**Therefore,**~~Given that West Connacht Coast SAC supports the same Annex II marine mammal QI and lies substantially further from the Proposed Development, the magnitude of effects at West Connacht Coast SAC is concluded to be no greater than, and in practice less than, those assessed for Blackwater Bank SAC. **It is therefore concluded that** there ~~**is**~~**will be no AEoI** ~~**for**~~**of the harbour porpoise QI of the West Connacht Coast SAC, as defined by** ~~**the**~~**its COs** ~~**of the site**~~**, as a result of any of the impacts considered** ~~**above affecting harbour porpoise from**~~**for Project Design Option 1** ~~**in this**~~**across any phase.**

6.4.16.5 **Based on the** ~~**increased**~~**representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

Transboundary sites within the UK

6.4.17 West Wales Marine / Gorllewin Cymru Forol SAC

Harbour porpoise

6.4.17.1 The ~~conservation objectives for harbour porpoise at this designated site~~relevant Annex II marine mammal QI site-specific CO at West Wales Marine SAC is to ensure that the integrity of the site is maintained and that it makes the best possible contribution to maintaining ~~Favourable Conservation Status (~~FCS~~)~~ for harbour porpoise in UK waters, ~~how this is~~as defined ~~is presented~~by the list of attributes and targets set out in Table 5.1 (NRW, 2019a).

6.4.17.2 ~~There are five key~~Eight potential ~~impacts on~~impact pathways relevant to harbour porpoise ~~associated with~~have been identified in relation to the construction, ~~operational, and~~operation

and maintenance, and decommissioning of the Proposed Development~~, which are presented in~~ Table 6.8 ~~and are assessed below for each phase of~~ (Table 6.8). These pathways have been assessed in detail for Blackwater Bank SAC which is also designated for the same Annex II marine mammal QI and is located approximately 19.13 km from the Proposed Development~~.~~ ~~These comprise of Injury and/ or disturbance from underwater noise caused by piling and construction activities, Injury and/ or disturbance caused by vessel movements, Changes in prey, Changes in EMF and Accidental pollution.~~, compared to approximately 49.75 km from West Wales Marine SAC.

~~6.4.17.3 With consideration that the impact severity is based on distance from the site of works, Blackwater Bank SAC (19.76 km) is designated for the same QIs as West Wales Marine/ Gorllewin Cymru Forol SAC (93.50 km) and is located nearer to the Proposed Development, it was concluded that the potential for AEoI is the same or reduced for this site. In Section 0, it has been concluded that none of the potential effects on harbour porpoise would result in an AEoI of the QIs.~~

6.4.17.3 As the severity and likelihood of all relevant impact pathways are intrinsically distance-dependent, Blackwater Bank SAC represents the closest designated site for harbour porpoise from the Proposed Development. The assessment presented in Section 6.4.1 therefore provides a conservative basis for evaluation and concluded that none of the identified impact pathways would result in an AEoI of Blackwater Bank SAC, with respect to the harbour porpoise QI.

6.4.17.4 ~~Therefore,~~Given that West Wales Marine SAC supports the same Annex II marine mammal QI and lies substantially further away from the Proposed Development, the magnitude of effects at West Wales Marine SAC is concluded to be no greater than, and in practice less than, those assessed for Blackwater Bank SAC. **It is therefore concluded that** there ~~is~~**will be no AEoI** ~~for~~**of the harbour porpoise QI of the West Wales Marine / Gorllewin Cymru Forol SAC, as defined by** ~~the~~**its COs** ~~**of the site**~~**, as a result of any of the impacts considered** ~~**above affecting harbour porpoise from**~~**for Project Design Option 1** ~~**in this**~~**across any phase.**

6.4.17.5 **Based on the representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

6.4.18 North Anglesey Marine / Gogledd Môn Forol SAC

Harbour porpoise

6.4.18.1 The relevant Annex II marine mammal QI site-specific COs at North Anglesey Marine SAC is to ensure that the integrity of the site is maintained and that it makes the best possible contribution to maintaining FCS for harbour porpoise in UK waters, as defined by the list of attributes and targets set out in Table 5.1 (NRW, 2019b).

6.4.18.2 Eight potential impact pathways relevant to harbour porpoise have been identified in relation to the construction, operation and maintenance, and decommissioning of the Proposed Development (Table 6.8). These pathways have been assessed in detail for Blackwater Bank SAC which is also designated for the same Annex II marine mammal QI and is located approximately 19.13 km from the Proposed Development, compared to approximately 61.61 km from North Anglesey Marine SAC.

6.4.18.3 As the severity and likelihood of all relevant impact pathways are intrinsically distance-dependent, Blackwater Bank SAC represents the closest designated site for harbour porpoise from the Proposed Development. The assessment presented in Section 6.4.1 therefore provides a conservative basis for evaluation and concluded that none of the identified impact pathways would result in an AEoI of Blackwater Bank SAC, with respect to the harbour porpoise QI.

6.4.18.4 Given that North Anglesey Marine SAC supports the same Annex II marine mammal QI and lies substantially further away from the Proposed Development, the magnitude of effects at North Anglesey Marine SAC is concluded to be no greater than, and in practice less than, those assessed for Blackwater Bank SAC. **It is therefore concluded that there will be no AEoI of the harbour porpoise QI of the North Anglesey Marine / Gogledd Môn Forol SAC, as defined by its COs, as a result of any of the impacts considered for Project Design Option 1 across any phase.**

6.4.18.5 ~~6.4.17.5~~ **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

6.4.19 ~~6.4.18~~ Lleyn Peninsula and the Sarnau / Pen Llyn a'r Sarnau SAC

Bottlenose dolphin

6.4.19.1 The relevant Annex II marine mammal QI site-specific COs at Lleyn Peninsula and the Sarnau SAC for bottlenose dolphin at this designated site is to maintain the FCS of the bottlenose dolphin QI, as defined by the following list of objectives, attributes and targets (NRW, 2025a; Table 5.1).

- *Objective 1:* The bottlenose dolphin population that use the SAC is maintained in favourable condition and stable or increasing over the medium and long term:
  - Population using the SAC: Population demographics such as reproductive success and survival rates are at levels needed for the population to be maintained in favourable condition; and
  - SAC residency: Maintain bottlenose dolphin residency in the SAC over the medium and long term.
- *Objective 2:* The bottlenose dolphin population that use the SAC continue to have access to, and be able to utilise habitats necessary to maintain the population in favourable condition:
  - Accessibility to habitat used by bottlenose dolphin: Bottlenose dolphins that use the SAC should not be significantly constrained from accessing necessary habitats within or outside of the site; and
  - ~~6.4.18.1 The conservation objectives for~~Anthropogenic disturbance: Bottlenose dolphin ~~at this designated site is to achieve favourable conservation status of the feature, how this is defined is presented in Table 5.1.~~ that use the SAC should not be subject to significant anthropogenic disturbance within or outside of the site.
- *Objective 3:* The bottlenose dolphin population that use the SAC have high quality habitat and sufficient food supply to support and maintain the population in favourable condition:
  - Habitat quality and function: Maintain the quality and function to support the bottlenose dolphin population that use the SAC in favourable condition;
  - Prey availability: Maintain the quality, abundance and diversity of prey needed for the bottlenose dolphin population that use the SAC in favourable condition; and
  - Water, sediment and prey contaminants: Contaminants are at levels not detrimental to the bottlenose dolphin population that use the SAC.

6.4.19.2 ~~6.4.18.2~~ There are ~~five key~~eight potential impacts on bottlenose dolphin associated with the construction, operational and maintenance, and decommissioning of the Proposed Development, which are presented in Table 6.8 and are assessed below for each phase of the Proposed Development.

6.4.19.3 ~~6.4.18.3~~ As covered in previous site assessment for other Annex II marine mammal receptors (Sections 6.4.1, 6.4.2, and 6.4.5), underwater noise has the potential to impact marine mammals ~~if the frequency is~~where the sound frequencies fall within their hearing range~~,~~ and ~~in particular if the~~ sound levels ~~are greater than the~~exceed relevant injury or disturbance thresholds.

6.4.19.4 With consideration of bottlenose dolphin, they are classified within the High Frequency (HF) cetacean ~~hearing group~~FHG and have ~~a~~an estimated hearing range of 150 Hz to 160 kHz~~. The impacts can range from~~ (Southall *et al.*, 2019). Underwater noise generated by piling activities associated with the Proposed Development falls within this hearing range and exceeds noise impact thresholds. Therefore, this activity has the potential to result in auditory injury, behavioural disturbance ~~and~~or temporary displacement, ~~to changes in behaviour including masking~~ depending on ~~the severity of the underwater noise~~sound level, duration of exposure and proximity to the source.

~~6.4.18.4 With consideration of the risk and impacts of auditory injury, all species of cetaceans rely on sonar for navigation, finding prey and communication (Southall *et al.*, 2007). The ecological consequences of PTS (a permanent and irreversible hearing impairment) are uncertain, although a loss of hearing could affect key life functions such as communication, predator detection, foraging, mating and maternal fitness, and could lead to a change in an animal's health or vital rates (Erbe *et al.*, 2018). Relating a potential loss in hearing to a biologically significant response is challenging due to a paucity of empirical data, however a potential consequence of a disruption in key life functions is that the health of impacted animals would deteriorate and potentially lead to reduced birth rate in females and mortality of individuals.~~

~~6.4.18.5 At a Department of Business, Energy, and Industrial Strategy (BEIS)-funded expert elicitation workshop in 2018, experts discussed the nature, extent, and potentially consequences of PTS to marine mammal species in the UK (Booth and Heinis, 2018). Using the best and most recent data available on the effects of PTS on marine mammals, the experts concluded that PTS did not mean animals were deaf, and the magnitude and frequency band in which PTS occurs is critical to assessing the effect on vital rates.~~

~~6.4.18.6 Exposure to loud underwater noises can lead to a reduction in hearing sensitivity which may be temporary (TTS) or permanent (PTS). PTS is defined by Southall et al. (2007) as a non-recoverable elevation of the hearing threshold of 6 dB. It has been assumed that PTS-onset occurs after TTS has grown to 40 dB, based on TTS growth rates obtained from scientific literature. Studies of auditory injury in relation to a typical piling sequence have suggested that hearing impairment caused by exposure to piling noise is likely to occur where the source frequencies overlap the range of peak sensitivity for the receptor species rather than across the whole frequency hearing spectrum (Kastelein et al., 2013a). For piling noise, most energy is between ~30 – 500 Hz, with a peak between 100-300 Hz and energy extending above 2 kHz (Kastelein et al., 2015; Kastelein et al., 2016). There are not studies specific to impacts on bottlenose dolphin, however studies on harbour porpoise and harbour seal (bottlenose dolphin has a hearing range considered to be between the two) have shown that exposure to impulsive pile driving noise induces TTS in a relatively narrow frequency band (Finneran, 2015), with statistically significant TTS occurring at 4 and 8 kHz, respectively (Kastelein et al., 2016) and centred at 4 kHz (Kastelein et al., 2012a; Kastelein et al., 2012b; Kastelein et al., 2013b; Kastelein et al., 2017). As a result, at an expert elicitation workshop, it was agreed that any threshold shifts to hearing caused by pile driving would manifest in the range of 2 – 10 kHz (Kastelein et al., 2017). It was also agreed that a PTS of 6 – 18 dB in a narrow frequency band in the 2 – 10 kHz region is unlikely to significantly affect the ability of individuals to survive and reproduce (Kastelein et al., 2017).~~

6.4.19.5 For each mitigated piling scenario (see Section 6.4.1.12), predicted impacts to bottlenose dolphin were informed by three regional density estimates (see Table 6.6) and using the

thresholds for impulsive noise outlined in Table 6.9. Full details of the underwater noise modelling methodology and the resulting impact areas and ranges are detailed in the Underwater Noise Assessment (NIS Volume III, Appendix 11.1: Underwater Noise Assessment (Revised March 2026)).

CONSTRUCTION PHASE ASSESSMENT

AUDITORY INJURY (PTS)

6.4.19.6 Predicted impact areas and maximum ranges for auditory injury (PTS-onset) to bottlenose dolphins from pile driving during construction from the Proposed Development, across both mitigated piling scenarios (ramp-up mitigation scenario and extended ramp-up mitigation scenario), are presented in Table 6.28Table 6.19: Predicted impact range of PTS-onset from pile driving at the SW WTG array location with harbour seal density estimates. For further information on densities used; see .

6.4.19.7 For the ramp-up mitigation scenario, the maximum instantaneous PTS-onset impact range was predicted to be less than 50 m for the installation of a 11 m monopile at all piling locations (Table 6.28Table 6.19: Predicted impact range of PTS-onset from pile driving at the SW WTG array location with harbour seal density estimates. For further information on densities used; see). Based on the highest regional density estimate, the SCANS-IV density estimate (Gilles *et al.,* 2023), this equates to a maximum of one individual potentially experiencing auditory injury, representing less than 0.01% of the reference population of 293 within the Irish Sea MU (IAMMWG, 2023). Using the cumulative PTS-onset thresholds, the maximum impact range at all piling locations also remained below 50 m, corresponding to a maximum of one individual (<0.01% of the MU reference population; Table 6.28).

6.4.19.8 With the implementation of the extended ramp-up mitigation scenario, the maximum instantaneous PTS-onset impact range remained at below 50 m at all piling locations, again equating to a maximum of one individual (<0.01% of the MU reference population; Table 6.28). Predicted cumulative PTS-onset impact ranges likewise remained below 50 m at all piling locations, equating to a maximum of one individual experiencing auditory injury (<0.01% of the MU reference population; Table 6.28).

6.4.19.9 Overall, predicted auditory injury to bottlenose dolphins from pile driving during construction is extremely limited in spatial extent and scale at all piling locations. The C WTG location represents the most relevant piling location in relation to Lleyn Peninsula and the Sarnau SAC and also corresponds to the location where the largest predicted impact ranges occur; however, even at this location, the scale of predicted impacts remains minimal and highly localised.

Table 6.28: Predicted impact range of PTS-onset from pile driving at the C WTG array location with bottlenose dolphin density estimates. For further information on densities used; see Table 6.6.

Piling Scenario	Piling location and Monopile diameter (m)		Density (animals/km²)	Area (km²)	Maximum range (m)	Number of animals[1,2]	Percentage of reference population[2] (%)
Instantaneous PTS-onset (unweighted SPL_{peak})							
Ramp-up mitigation scenario	C WTG	11 m	0.0201	<0.01	<50	<1	<0.01
			0.2352			<1	<0.01
			0.198099			<1	<0.01
Extended ramp-up mitigation scenario	C WTG	11 m	0.0201	<0.01	<50	<1	<0.01
			0.2352			<1	<0.01
			0.116527			<1	<0.01
Cumulative PTS-onset (weighted SEL_{cum})							
Ramp-up mitigation scenario	C WTG	11 m	0.0201	<0.01	<50	<1	<0.01
			0.2352			<1	<0.01

				0.116527			<1	<0.01
Extended ramp-up mitigation scenario	C WTG	11 m		0.0201	<0.01	<50	<1	<0.01
				0.2352			<1	<0.01
				0.116527			<1	<0.01

[1]The predicted number of individuals exposed to PTS-onset (both instantaneous and cumulative) from pile driving is fewer than one animal across all density scenarios. Importantly, the maximum PTS-onset impact range falls entirely within the 1,000 m Rsafe mitigation distance. With the implementation of the extended ramp-up mitigation procedure and associated MMMP measures (monitoring and soft-start procedures), marine mammals are expected to be displaced from the impact area prior to the onset of full hammer energy. Consequently, no animals are expected to be exposed to sound levels capable of causing auditory injury (PTS).

[2]The number of animals disturbed and the reference population are representative of the Irish Sea MU population (IAMMWG, 2023). The number of animals disturbed is not representative of the numbers disturbed within the Lleyn Peninsula and the Sarnau SAC.

6.4.19.10 ~~6.4.18.7~~ As considered within the harbour porpoise underwater noise assessment in Section ~~0~~ ~~studies have shown~~ 6.4.1, evidence indicates that there are frequency-specific differences in the onset and ~~growth~~progression of noise-induced threshold shifts ~~in relation to~~, depending on the characteristics of the noise source and hearing sensitivity of the receiving species. At a UK BEIS-funded export elicitation workshop in 2018, ~~experts~~it was concluded that the probability of PTS significantly affecting the survival and reproduction of bottlenose dolphins was very low, assuming an impact a 6 dB PTS in the 2 – 10 kHz frequency range (Booth ~~and Heinis, 2018~~*et al.,* 2019).

~~6.4.18.8 With regards to underwater noise produced by UXO clearance, there are two activities that produce noise, higher order detonation, and low-order clearance methods. It is unknown if there are UXO that require clearance at the time of this assessment, and therefore is unknown to what level of clearance will be carried out. Therefore, this assessment is based on high-order UXO clearance being carried out which is viewed as the worst-case scenario in terms of underwater noise generation.~~

~~6.4.18.9 The main underwater noise produced by high-order detonation is outside of the region of greatest sensitivity for bottlenose dolphin (Southall et al., 2019), and there is a pronounced reduction in energy levels above ~5-10 kHz (von Beckmann et al., 2015 and Salomons et al., 2021). Due to this, with consideration of the above sensitivity, it is concluded that bottlenose dolphin have a low sensitivity to this effect.~~

~~6.4.18.10 With regards to underwater noise produced by geophysical surveys, exact surveys and equipment is yet to be decided, therefore as a precautionary approach we have considered all types of noise generation from the varied survey types. Surveys such as multibeam EchoSounder (MBES) and side scan sonar (SSS) produce sounds which are sonar based and impulsive. Surveys comprising of vibrocoring typically produce non-implusive sound. The equipment's noise source levels are provided in~~ Table 6.~~9 and Table 6.10.~~

~~6.4.18.11 Very limited information exists on the impacts of site surveys (geophysical and geotechnical) to marine mammals, with most available studies investigating the impact of seismic airguns. However, all species of cetaceans rely on sonar for navigation, finding prey and communication (Southall *et al.*, 2007). The ecological consequences of PTS are uncertain, although a loss of hearing could affect key life functions such as communication, predator detection, foraging, mating and maternal fitness, and could lead to a change in an animal's health or vital rates (Erbe *et al.*, 2018). Relating a potential loss in hearing to a biologically significant response is challenging due to a paucity of empirical data, however a potential consequence of a disruption in key life functions is that the health of impacted animals would deteriorate and potentially lead to reduced birth rate in females and mortality of individuals.~~

~~6.4.18.12 A study by Lucke *et al.* (2009) indicated that TTS could be induced in harbour porpoise at 350 m when exposed to an airgun impulse at a peak pressure of 200 dB_{pk-pk} re 1 µPa with corresponding SEL of 164.5 dB re $\mu Pa^2{}_s$) in shallow waters (~4 m), however this study is highly conservative as it assumes that the animal would remain stationary throughout the exposure. Evidence from other studies suggests that harbour porpoises exposed to such noise sources would likely move away from the source, and therefore leave the impact range of PTS-onset (Hermannsen *et al.*, 2015).~~

~~6.4.18.13 Furthermore, it is expected that vessel presence will act as a deterrent to harbour porpoise, reducing the risk of auditory injury (Benhemma-Le Gall *et al.*, 2023). Therefore, it is highly unlikely that harbour porpoise will be present in the immediate vicinity at the start of any survey activity. The same can be applied to bottlenose dolphin which we view would be highly unlikely to be present within the immediate vicinity, and with consideration of their reduced sensitive, conclude this is a negligible risk for injury.~~

6.4.19.11 ~~6.4.18.14 While~~Although PTS ~~is~~represents a permanent auditory effect ~~which cannot be recovered from~~, the most likely response of ~~a~~ marine ~~mammal~~mammals to noise levels ~~that could induce~~capable of inducing TTS is ~~to flee~~behavioural avoidance of the ~~area~~noise source (Southall

et al., 2007). ~~Therefore, animals~~As such, individuals exposed to ~~these~~increasing noise levels ~~that could induce TTS are likely to actively avoid hearing damage by moving~~are expected to move away from the source before experiencing more severe auditory effects.

6.4.19.12 ~~6.4.18.15~~ Available evidence does not ~~suggest~~indicate that bottlenose dolphins ~~would be significantly impacted by PTS. They are highly adaptable and with reasonable tolerance for this kind of impact, and therefore have a low sensitivity to this kind of injury.~~are likely to experience population-level effects as a result of PTS at the very small spatial scales predicted for the Proposed Development (Kastelein *et al.*, 2017). The likelihood of auditory injury occurring, and of such an injury resulting in meaningful effects on individual fitness, is considered very low.

6.4.19.13 In addition, the Developer has committed to the implementation of project-specific mitigation measures during piling activities, as set out within the MMMP (NIS Volume III, Appendix 25.2: Marine Mammal Mitigation Plan (Revised March 2026)), which are applicable to both cetacean and pinniped receptors. These measures are designed to minimise the risk of auditory injury (PTS) to bottlenose dolphins arising from piling-related underwater noise to a negligible level and will, as a minimum, adhere to relevant international best practice, including DAHG (2014) guidance (Table 6.7).

~~6.4.18.16 With consideration for behavioural changes from underwater noise caused by the Proposed Development, a study of bottlenose dolphin response to impulsive noise (including the piling campaigns of Beatrice offshore windfarm and Moray East offshore windfarm, northeast Scotland), suggest that these activities did not cause displacement of the species from the southern coast of the Moray Firth (Fernandez-Betelu et al., 2021). At the small temporal scale, dolphin detections increased, and the species remained within the predicted impacted area close to the offshore activities, for a median of two hours per day, on days with impulsive noise. This could be due to modifications in group size and/or behaviour, or changes in vocalisation rate or amplitude in response to impulsive noise generated by offshore activities. It is also important to note that bottlenose dolphin occurrence is largely influenced by various natural drivers, such as prey abundance, which could be deemed of higher importance in affecting their occurrence. Other studies in the Cromarty Firth, northeast Scotland have suggested small spatial and temporal scale disturbance of bottlenose dolphins from piling activities have occurred previously, as evidenced by a slight reduction of the presence, detection positive hours, and the encounter duration in the vicinity of construction works, although dolphins were not excluded entirely from the area (Graham et al., 2017a).~~

~~6.4.18.17 There is potential for behavioural disturbance due to underwater noise to result in disruption in foraging and resting activities and an increase in travel and energetic costs (Marley *et al.*, 2017a and b; Pirotta *et al.*, 2015), although evidence suggests that this will occur on a small spatial and temporal scale. Furthermore, New *et al.* (2013) showed that while there is potential for disturbance to affect bottlenose dolphin behaviour and health, which will then impact vital rates and population dynamics, individuals are able to compensate for immediate behavioural responses to disturbances caused by vessel activity. This suggests that they have some capability to adapt their behaviour and tolerate certain levels of temporary disturbance. As with the above conclusion for injury from underwater noise, with consideration of their high adaptability, recoverability and reasonable tolerance, it is concluded they have low sensitivity to this kind of impact. A full assessment on the behavioural impact of vessel movements is present in sections 0 to 0~~

~~6.4.18.18 Available guidance on assessing the significance of noise disturbance from UXO detonation against the conservation objectives of SACs with bottlenose dolphins as qualifying interests is limited, however the closest relevant guidance is with regards to harbour porpoise SACs within England, Wales and Northern Ireland. As a species is considered to be more sensitive to these impacts than seals we have adopted that guidance on a precautionary basis, and impacts are viewed to likely be lesser. The guidance recommends an effective deterrence range (EDR) of 26~~

km for high-order detonations (JNCC, 2020). It should be noted that this EDR is based upon avoidance from piling, not UXO clearance, and the same guidance states that '*a one off explosion would probably only elicit a startle response and would not cause widespread and prolonged displacement*'. With consideration of the resilience of the species highlighted above, it is concluded that bottlenose dolphin have negligible sensitivity to UXO clearance behavioural disturbance effects when considering the integrity of the designated site.

6.4.18.19 The assessment has been informed by the Underwater Noise Assessment by Subacoustech (Volume III, Appendix 11.1) which includes the results of numerical modelling using the INSPIRE underwater noise model.

CONSTRUCTION AND DECOMMISSIONING

6.4.18.20 Piling will only be carried out during this phase of the Proposed Development. Based on calculations and data presented in Table 6.19 it is calculated that the maximum instantaneous PTS-onset impact range was <50 m, therefore, no dolphins are expected to be impacted. Using the cumulative PTS-onset thresholds, the maximum impact range for dolphin species was <100 m, and as such, no dolphins are expected to be impacted.

6.4.18.21 With regards to UXO clearance, based on the modelling presented in Table 6.18 : PTS-onset ranges and numbers of bottlenose dolphin modelled to be within range for all potential charge weights, the maximum PTS-onset impact range is 840 m which is the smallest of all the species assessed. This would result in up to 1 bottlenose dolphin (up to 0.18% of the population) experiencing PTS from a high-order detonation with the greatest charge weight.

Table 6.18 : PTS-onset ranges and numbers of bottlenose dolphin modelled to be within range for all potential charge weights

Charge Weight (kg)	Maximum range (m)	Site specific DAS density estimate/ SCANS-IV density estimate (animals/km²)	Number of animals	% of reference population
PTS-onset (unweighted SPLpeak)				
0.5 (low order)	70	0.0201 / 0.2352	0	0.0
25 + donor	260		0 / <1	0.0 / 0.02
55 + donor	340		<1 / <1	<0.01 / 0.03
120 +donor	450		<1 / <1	<0.01 / 0.05
240 + donor	560		<1 / <1	0.01 / 0.08
525 + donor	730		<1 / <1	0.01 / 0.13

Charge Weight (kg)	Maximum range (m)	Site specific DAS density estimate/ SCANS-IV density estimate (animals/km²)	Number of animals	% of reference population
700 + donor	810		<1 / <1	0.01 / 0.17
800 + donor	840		<1 / 1	0.02 / 0.18
PTS-onset (weighted SELss)				
0.5 (low order)	<50	0.0201 / 0.2352	0	0
25 + donor	<50		0	0
55 + donor	<50		0	0
120 +donor	<50		0	0
240 + donor	<50		0	0
525 + donor	50		0	0
700 + donor	60		0	0
800 + donor	60		0	0
Disturbance				
High Order Clearance	26,000	0.0201/ 0.2352	43/ 499	14.57/ 170
Low Order Clearance	5,000	0.0201/ 0.2352	2/ 18	0.54/ 6.30

6.4.19.14 In relation to the site-specific COs for Lleyn Peninsula and the Sarnau SAC (Table 5.1), the potential effects of underwater noise associated with pile driving on the bottlenose dolphin QI have been assessed with respect to the attributes relating to maintaining the population in favourable condition, residency, continued accessibility to supporting habitats and anthropogenic disturbance.

6.4.19.15 With regarding accessibility to suitable habitat and anthropogenic disturbance, pile driving activities and associated underwater noise capable of resulting in auditory injury (PTS) that would

be short-term and temporary in nature and would not result in permanent habitat exclusion or create a barrier to site use. Predicted PTS-onset impact ranges (maximum of less than 50 m) are limited in spatial extent and substantially smaller than the distance to Lleyn Peninsula and the Sarnau SAC (approximately 71.91 km from the closest piling location) and do not overlap the SAC boundary. As such, bottlenose dolphins within the SAC will not be exposed to levels of underwater noise capable of causing in auditory injury. Any highly unlikely auditory injury to individuals occurring outside the SAC would not constrain access to habitats within the site.

6.4.19.16 Regarding the population and residency attributes, even in the highly unlikely event that an individual experienced PTS-onset, available evidence indicates that such injury would be unlikely to result in significantly effects on individual survival or reproductive success (Kastelein *et al.*, 2017), particularly at the very small numbers predicted (maximum one individual, or <0.01% of the reference population). Therefore, pile driving activities are not expected to introduce anthropogenic noise at levels that could affect the population using the site or their residency in the site, and therefore they will not affect the condition of, or the contribution to FCS by, bottlenose dolphins associated with the Lleyn Peninsula and the Sarnau SAC.

Table 6.19: PTS-onset from pile driving and disturbance at array locations with bottlenose dolphin densities estimates

Piling location and Monopile		Site specific DAS density estimate/ SCANS-IV density estimate (animals/km²)	Area (km²)	Maximum range (m)	Number of animals	% of reference population
Instantaneous PTS-onset (unweighted SPLpeak)						
NW	7 m	0.0201 / 0.2352	<0.01	<50	0	0.00
	11 m		<0.01	<50	0	0.00
C	7 m	0.0201 / 0.23520.08	<0.01	<50	0	0.00
	11 m		<0.01	<50	0	0.00
SW	7 m	0.0201 / 0.23520.08	<0.01	<50	0	0.00
	11 m		<0.01	<50	0	0.00
N-OSP	7 m	0.0201 / 0.23520.08	<0.01	<50	0	0.00
	14 m		<0.01	<50	0	0.00
S-OSP	7 m	0.0201 / 0.23520.08	<0.01	<50	0	0.00

Piling location and Monopile		Site specific DAS density estimate/ SCANS-IV density estimate (animals/km²)	Area (km²)	Maximum range (m)	Number of animals	% of reference population
	14 m		0.01	60	0	0.00
Cumulative PTS onset (weighted SELcum)						
NW	7 m	0.0201 / 0.2352	<0.1	<100	0	0.00
	11 m		<0.1	<100	0	0.00
C	7 m	0.0201 / 0.23520.08	<0.1	<100	0	0.00
	11 m		<0.1	<100	0	0.00
SW	7 m	0.0201 / 0.23520.08	<0.1	<100	0	0.00
	11 m		<0.1	<100	0	0.00
N-OSP	7 m	0.0201 / 0.23520.08	<0.1	<100	0	0.00
	14 m		<0.1	<100	0	0.00
S-OSP	7 m	0.0201 / 0.23520.08	<0.1	<100	0	0.00

Piling location and Monopile		Site specific DAS density estimate/ SCANS-IV density estimate (animals/km²)	Area (km²)	Maximum range (m)	Number of animals	% of reference population
	14 m		<0.1	<100	0	0.00
Predicted disturbance						
NW	7 m	0.0201 / 0.2352	-	-	102 / 1,197	34.90 / 408.41
	11 m		-	-	103 / 1,207	35.22 / 412.07
C	7 m	0.0201 / 0.23520.08	-	-	165 / 1,929	56.28 / 658.52
	11 m		-	-	165 / 1,925	56.16 / 657.13
SW	7 m	0.0201 / 0.23520.08	-	-	178 / 2,082	60.72 / 710.52
	11 m		-	-	179 / 2,092	61.01 / 713.96
N-OSP	7 m	0.0201 / 0.23520.08	-	-	115 / 1,346	39.25 / 459.29
	14 m		-	-	116 / 1,355	39.53 / 462.59
S-OSP	7 m	0.0201 / 0.23520.08	-	-	176 / 2,064	60.20 / 704.44

Piling location and Monopile	Site specific DAS density estimate/ SCANS-IV density estimate (animals/km²)	Area (km²)	Maximum range (m)	Number of animals	% of reference population
14 m		-	-	177 / 2,077	60.57 / 708.81

6.4.19.17 ~~6.4.18.22 Therefore, it is~~**With consideration of the implementation of the extended ramp-up scenario and project-specific MMMP measures ensuring that no animals are within the area of predicted auditory injury (PTS-onset) ranges, the absence of overlap with the SAC (with the greatest predicted impact range of up to 50 m), and the negligible number and proportion of the wider MU potentially affected (<1 and <0.01%, respectively), it is therefore concluded there will be no AEoI ~~upon the integrity of~~of the bottlenose dolphin feature of the Lleyn Peninsula and the Sarnau SAC / Pen Llyn a'r Sarnau SAC, as defined by ~~the~~its COs ~~of the site~~, as a result of auditory injury ~~from~~due to underwater noise ~~impacting bottlenose dolphin from~~associated with piling for Project Design Option 1.**

6.4.19.18 ~~6.4.18.23~~ **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is ~~concluded~~considered that the same conclusion of no AEoI would also apply to Project Design Option 2.**

BEHAVIOURAL DISTURBANCE

6.4.19.19 The predicted number of bottlenose dolphins that may experience behavioural disturbance as a result of pile driving during construction is presented in Table 6.29. Disturbance has been assessed using two approaches and expressed as a proportion of the relevant reference population (Table 6.6):

- Application of dose-response relationship for impulsive noise developed for harbour porpoise (Graham *et al.*, 2019); and
- Comparison against the United States (US) National Marine Fisheries Service (NMFS) Level B harassment threshold for strong behavioural disturbance (NOAA, 2023), to provide additional context on the likely extent of disturbance.

6.4.19.20 In the absence of species-specific dose-response data for bottlenose dolphins, the harbour porpoise dose-response relationship has been applied on a precautionary basis. This approach is considered highly conservative, as harbour porpoises are well documented as being the most behaviourally sensitive cetacean to anthropogenic noise, frequently exhibiting avoidance and reduced vocalisation in response to a range of noise sources (e.g. Benhemma-Le Gall *et al.*, 2021; Brandt *et al.*, 2013; 2018; Thompson *et al.*, 2013a; 2020; Sarnocińska *et al.*, 2020). In contrast, bottlenose dolphins have generally shown to exhibit weaker or more context-dependent behavioural response to impulsive noise (Fernandez-Betelu *et al.*, 2021; Kastelein *et al.*, 2006; Stone *et al.*, 2017).

6.4.19.21 ~~6.4.18.24~~ For the ramp-up mitigation scenario, using the dose-response curve and uniform density estimate of 0.0201 animals/km^2 from the ObSERVE surveys (Rogan *et al.*, 2018), it was estimated that a maximum of ~~179~~101 animals (~~61.01~~34.47% of the Irish Sea MU reference population of 293 animals; IAMMWG, 2023) will experience behavioural disturbance as a result of pile driving of the 11 m monopile at the ~~SW~~C WTG location (Table 6.29). This approach is considered to be conservative because it assumes that the density within the relevant survey stratum (Stratum 5 ~~(~~; western Irish Sea) is the same across the wider extent of the Irish Sea of which the noise contours extend across.

6.4.19.1 ~~6.4.18.25~~ Whereas, using the higher uniform density estimate of 0.2352 animals/km^2 from the wider SCANS-IV surveys (Gilles *et al.*, 2023), it was estimated that a maximum of ~~2,092~~1,181 animals (~~713.96~~403.07% of the Irish Sea MU reference population) will experience behavioural disturbance as a result of pile driving of the 11 m monopile at the ~~SW~~C WTG location (Table 6.29). This output is also not considered to be ~~realistic~~a robust indicator of population-level exposure as it assumes a uniform density and does not capture the variability in coastal and offshore population bottlenose dolphin densities and distributions within the Irish Sea.

6.4.19.2 ~~6.4.18.26~~ Therefore, in order to account for ~~the~~this non-uniform density of bottlenose dolphin across the Irish Sea, further modelled density surfaces derived from ~~SCANS-III~~SCANS-IV were

also used to calculate the number of ~~animals~~individuals disturbed. Using this approach, it was estimated that a maximum of ~~187 animals (63.79~~995 individuals (339.59% of the reference Irish Sea MU reference population) will experience behavioural disturbance as a result of pile driving of the ~~14~~11 m monopile at the ~~S-OSP~~C WTG location~~. Both of these approaches are over-predicting~~ (Table 6.29).

6.4.19.1 The ~~number of animals available in the area that could be disturbed by pile driving as the number of animals calculated exceeds the~~approach of using the dose-response curve resulted in predicted numbers that in some cases exceed the Irish Sea MU reference population size of 293 animals (IAMMWG, 2023). Therefore, these calculations are not considered to be robust indicators of population-level exposure.

6.4.19.2 This apparent overestimation reflects recognised limitations in the MU population estimate, which is based on broad-scale surveys, such as SCANS data, and does not fully capture localised coastal or semi-resident bottlenose dolphin populations in the Irish Sea. For example, the most recent abundance estimate for the semi-resident bottlenose dolphin population at Cardigan Bay in West Wales (which is in the Irish Sea MU) alone were 232 individuals (95% CI: 119 to 451; Cuthbertson *et al.*, 2025). In addition, telemetry and photo-identification studies demonstrate large scale movement of bottlenose dolphins across the Irish Sea, the west coast of Ireland and the wider northeast Atlantic (O'Brien *et al.*, 2009; Robinson *et al.*, 2012), indicating that the Irish Sea MU reference population size is likely to be an under-representation of the number of bottlenose dolphins that may be present in the MU.

6.4.19.3 Furthermore, it is important to highlight the significant difference between the SCANS-III and SCANS-IV abundance estimates of bottlenose dolphins in the Irish Sea. The SCANS-IV abundance estimate for the Irish Sea (blocks CS-D and CS-E) is 8,326 animals (Gilles *et al.*, 2023) whereas the Irish Sea MU population is derived from the lower SCANS-III abundance estimates, resulting in a population size of 293 (IAMMWG, 2023). As a result, the number of animals predicted to be disturbed using the density estimate from SCANS-IV is not compatible with the MU population size, resulting in a highly unrealistic proportion of the MU population estimated as impacted given that the population size is under-estimated. If the population size is taken to be 8,326 animals, the percentage of the population predicted to be disturbed reduces to 14.18%, when assuming 1,181 animals are disturbed using the dose-response curve.

6.4.19.4 The modelled disturbance contours are predicted to overlap with the Lleyn Peninsula and the Sarnau SAC. However, only the contours below 140 dB overlap, at which point the probability of a disturbance response in individuals exposed to noise is 1.2-18.5%, indicating that most animals in the site will not experience disturbance as a result of exposure to the noise. These contours represent sound levels associated with temporary and reversible behavioural responses rather than injury, and do not imply displacement from the site.

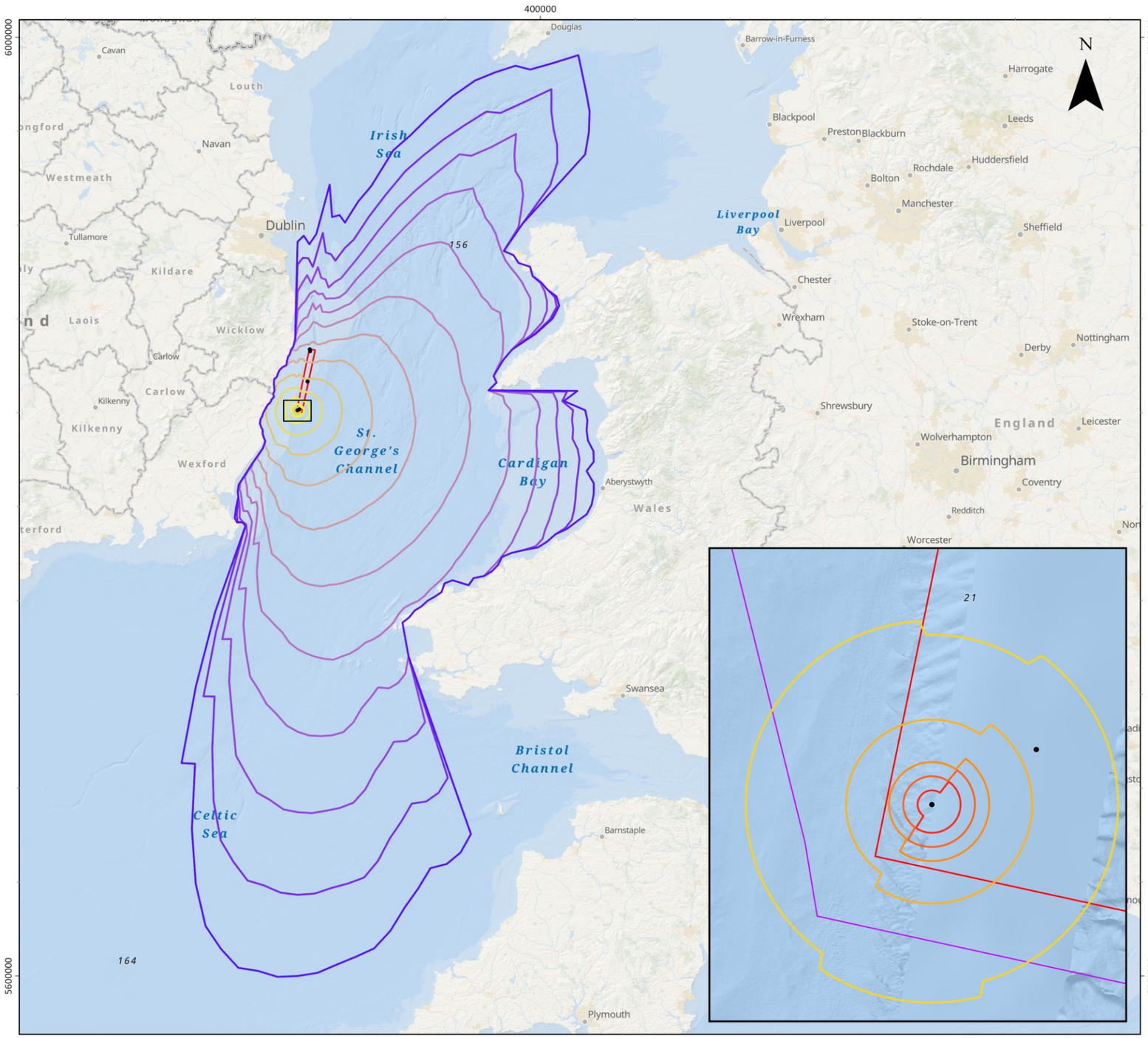
Table 6.29: Predicted impact of disturbance to bottlenose dolphin from pile driving at C WTG location using dose-response curves. For further information on densities used; see Table 6.6

Piling Scenario	Piling location and Monopile diameter (m)	Density (animals/km^2)	Number of animals disturbed[1]	Percentage of reference population[1] (%)
Ramp-up and extended ramp-up mitigation scenarios	C WTG 11 m	0.0201	101	34.47
		0.2352	1,181	403.07

			0.198099	995	339.59

[1]The number of animals disturbed and the reference population are representative of the Irish Sea MU population (IAMMWG, 2023). The number of animals disturbed is not representative of the numbers disturbed within the Lleyn Peninsula and the Sarnau SAC.

6.4.19.5 ~~6.4.18.27 The noise contours extend to cover the majority of the Irish Sea Management Unit (MU) (~~Figure 6.~~5~~16 ~~and Figure 6.6), which is used as the reference population for bottlenose dolphin. Therefore, it is anticipated that the majority of the reference population of 293 dolphins will be within the disturbance contours. However, the number and proportion of bottlenose dolphin disturbed during pile driving was calculated using the dose-response curve for harbour porpoise from Graham et al. (2017b), as there is no corresponding species-specific data available for bottlenose dolphin. However, studies suggest that bottlenose dolphins are typically less sensitive to behavioural disturbance than harbour porpoise (e.g. Culloch et al., 2016; Kastelein et al., 2006; Stone et al., 2017). Therefore, it is expected that the probability of response to underwater noise from pile driving would be lower, resulting in a very conservative calculation of the number and proportion of bottlenose dolphins disturbed.~~Overall, it is expected that the probability of bottlenose dolphin behavioural response to underwater noise from pile driving would be lower than predicted above.



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Arklow Bank Wind Park 2

Behavioural Disturbance Dose-response Contours for the Installation of an 11m Monopile at the SW Location

Legend

- ABWP2 Array Area
- ABWP2 Cable Corridor and Working Area
- Noise Modelling Locations

dBht Level:

- 120 dB SELss
- 125 dB SELss
- 130 dB SELss
- 135 dB SELss
- 140 dB SELss
- 145 dB SELss
- 150 dB SELss
- 155 dB SELss
- 160 dB SELss
- 165 dB SELss
- 170 dB SELss
- 175 dB SELss
- 180 dB SELss
- 185 dB SELss
- 190 dB SELss
- 195 dB SELss
- 200 dB SELss



Notes

Esri, TomTom, FAO, NOAA, USGS, GSI, Esri, Garmin, NaturalVue, OceanWise, Esri, GEBCO, Garmin, NaturalVue, Esri UK, Esri, TomTom, Garmin, Foursquare, GeoTechnologies, Inc, METI/ NASA, USGS, Esri UK, Esri, TomTom, Garmin, FAO, NOAA, USGS, Esri, GEBCO, Garmin, NaturalVue. Contains Ordnance Survey data © Crown copyright and database rights (2022). OS OpenData.

Coordinate System:
ETRS 1989 UTM Zone 30N

0 30 60 km

0 10 20 nm

Scale	Date	Drawn By	Checked By	Approved By
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Figure Number 6.5

Figure Reference: Ark_005_5dB11mMonopileSWFig6.5

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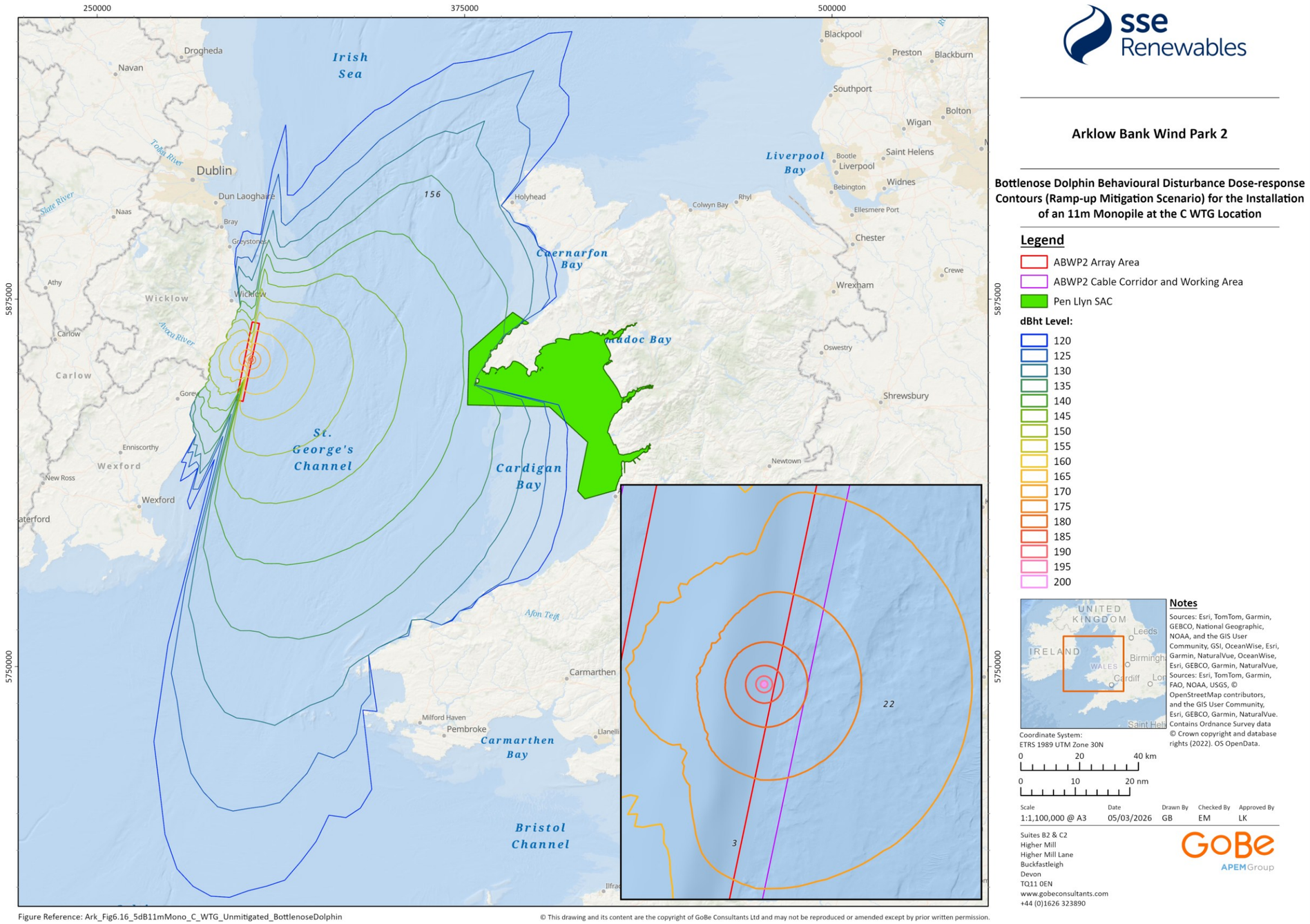

Figure Reference: Ark_Fig6.16_5dB11mMono_C_WTG_Unmitigated_BottlenoseDolphin

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Bottlenose Dolphin Behavioural Disturbance Dose-response Contours (Ramp-up Mitigation Scenario) for the Installation of an 11m Monopile at the C WTG Location

Legend

- ABWP2 Array Area
- ABWP2 Cable Corridor and Working Area
- Pen Llyn SAC

dBht Level:

- 120
- 125
- 130
- 135
- 140
- 145
- 150
- 155
- 160
- 165
- 170
- 175
- 180
- 185
- 190
- 195
- 200

Notes

Sources: Esri, TomTom, Garmin, GEBCO, National Geographic, NOAA, and the GIS User Community, GSI, OceanWise, Esri, Garmin, NaturalVue, OceanWise, Esri, GEBCO, Garmin, NaturalVue, Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community, Esri, GEBCO, Garmin, NaturalVue. Contains Ordnance Survey data © Crown copyright and database rights (2022). OS OpenData.

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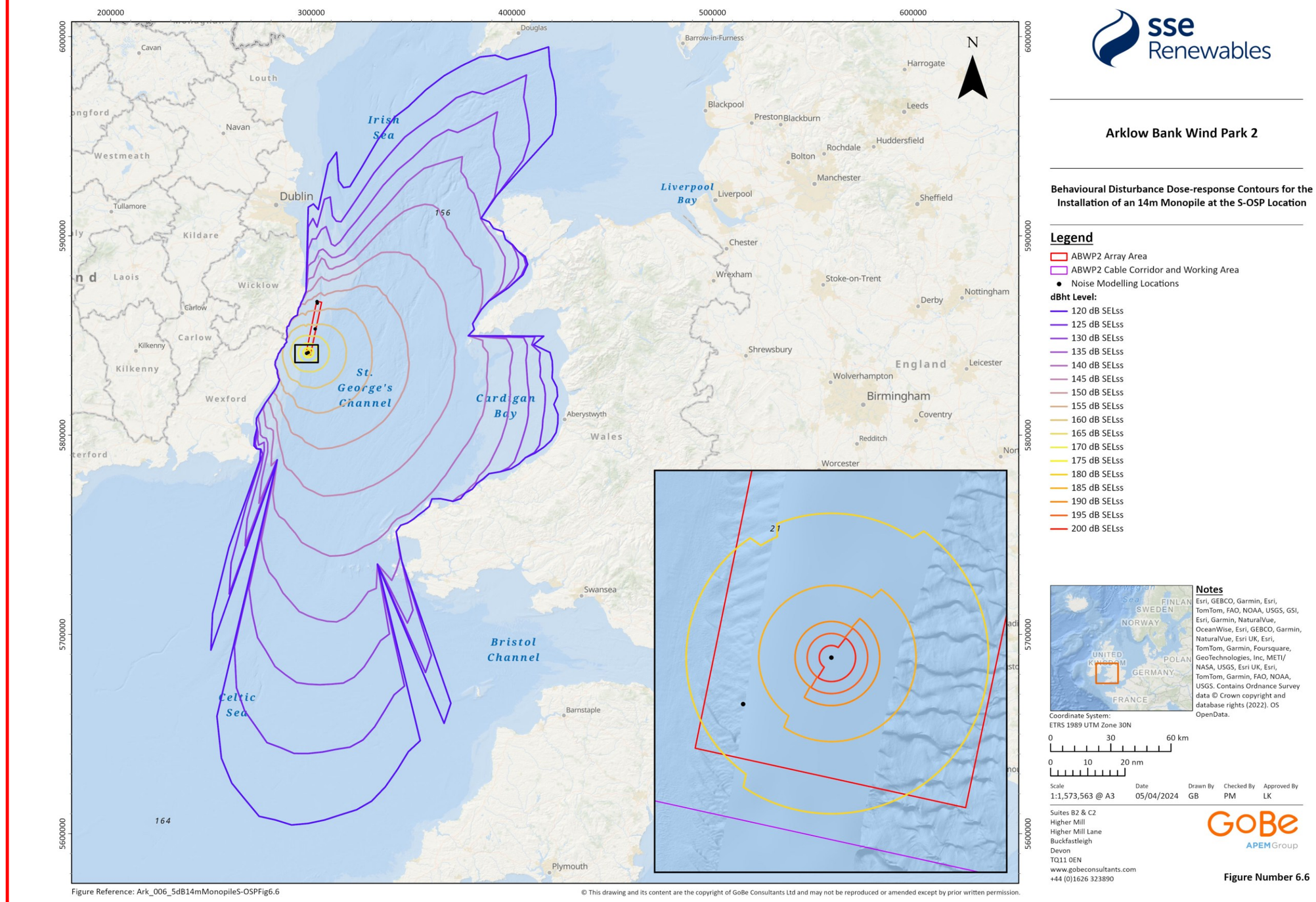
Figure 6.~~5~~16: Behavioural disturbance dose-response contours (ramp-up mitigation scenario) for the installation of ~~the 11m~~an 11 m monopile at C WTG location and Pen Llyn SAC for bottlenose dolphin QI



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Arklow Bank Wind Park 2

Behavioural Disturbance Dose-response Contours for the Installation of an 14m Monopile at the S-OSP Location

Legend

- ABWP2 Array Area
- ABWP2 Cable Corridor and Working Area
- Noise Modelling Locations

dBht Level:

- 120 dB SELss
- 125 dB SELss
- 130 dB SELss
- 135 dB SELss
- 140 dB SELss
- 145 dB SELss
- 150 dB SELss
- 155 dB SELss
- 160 dB SELss
- 165 dB SELss
- 170 dB SELss
- 175 dB SELss
- 180 dB SELss
- 185 dB SELss
- 190 dB SELss
- 195 dB SELss
- 200 dB SELss

Notes

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0 30 60 km

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Figure Number 6.6

Figure Reference: Ark_006_5dB14mMonopileS-OSPFig6.6

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~~**Figure 6.6: Behavioural Disturbance Dose-response Contours for the installation of the 14m monopile**~~

6.4.18.28 Furthermore, the reference population does not take into account the connectivity of the reference population with other areas. Studies have shown large scale movement of bottlenose dolphins around Ireland and indicated connectivity with the population on the west coast of the Ireland (O'Brien *et al.*, 2009). Long distance movements from the Atlantic to the North Sea between populations in the UK and Ireland have also been reported by Robinson *et al.* (2012). Therefore, the size of the reference population used from the Irish Sea MU is likely to be an under-representation of the number of bottlenose dolphins that may be present in the MU Study Area. Equally, the most recent abundance estimates from the semi-resident population at Cardigan Bay in West Wales (which is within the Irish Sea MU) alone were 147 individuals (95% CI: 127 to 194; NRW, 2018b). The design of broad scale surveys, such as SCANS, used to derive MU population estimates are not able to capture localised, coastal populations such as that of Cardigan Bay, providing further evidence to suggest that the reference population size has been under-estimated.

6.4.18.29 Overall, it is likely that a significant proportion of the MU population will experience disturbance from underwater noise. However, considering the low sensitivity of the species and evidence clarified above, it is not anticipated that this will result in a significant change in behaviour, or impact reproductive success or physiology.

6.4.19.6 Given this uncertainty with the harbour porpoise dose-response assessment, NMFS Level B harassment thresholds have also been applied to calculate the number and proportion of bottlenose dolphin disturbed during pile diving. Under the US Marine Mammal Protection Act, Level B harassment is defined as disturbance that disrupts behavioural patterns (e.g. migration, breathing, nursing, breeding, feeding, or sheltering) without injury (NOAA, 2023). For non-explosive impulsive noise sources such as impact pile driving, this threshold predicts that Level B harassment will occur when an animal is exposed to received sound levels exceeding 160 dB re 1 µPa (rms) (Guan and Brookens, 2021; NMFS, 2024; Malme *et al.*, 1984). Behavioural responses at or beyond this threshold are generally expected to be less severe and reversible, such as short-term changes in movement, dive profile, and/or modification of vocal behaviour (Southall *et al.*, 2007), and may vary according to individual experience and previous noise exposure.

6.4.19.7 When comparing these predicted numbers against those calculated using the dose-response curve, they are considerably lower (Table 6.30). For example, under the ramp-up mitigation and extended ramp-up mitigation scenarios and using the SCANS-IV uniform density estimate, a maximum of 259 individuals are predicted to experience behavioural disturbance as a result of pile driving of the 11 m monopile at the C WTG location (Table 6.29) compared to 1,181 individuals using the dose-response approach (Table 6.29). If the population size is taken to be 8,326 animals, the percentage of the population predicted to be disturbed reduces to 3.11%, when assuming 259 individuals are disturbed. This further demonstrates that the dose-response method results in a highly conservative assessment of disturbance for bottlenose dolphins.

Table 6.30: Predicted impact of disturbance to bottlenose dolphin from pile driving at C WTG location using level B harassment thresholds. For further information on densities used; see Table 6.6

Piling Scenario	Piling location and Monopile diameter (m)		Density (animals/km^2)	Number of animals disturbed[1]	Percentage of reference population[1] (%)
	C WTG	11 m	0.0201	23	7.85

Ramp-up and extended ramp-up mitigation scenarios	0.2352	259	88.40
	0.198099	218	74.40

[1]*The number of animals disturbed and the reference population are representative of the Irish Sea MU population (IAMMWG, 2023). The number of animals disturbed is not representative of the numbers disturbed within the Lleyn Peninsula and the Sarnau SAC.*

~~6.4.18.30 Furthermore, as detailed in Section 6.3.3 and Table 6.7, a MMMP will be implemented which will further minimise any potential impacts.~~

6.4.19.8 Evidence from comparable offshore wind farm piling activities indicates that bottlenose dolphins are not excluded from affected areas and may continue to use habitats during periods of impulsive noise, albeit with short-term changes in behaviour or space use (Fernandez-Betelu *et al.*, 2021; Graham *et al.*, 2017a). Furthermore, the results of the iPCoD modelling show that there is no significant effect of disturbance resulting from pile driving at the Proposed Development to bottlenose dolphin populations, with the impacted population predicted to continue at a stable trajectory at the same size (99.9%) as the un-impacted population up to 24 years after piling has ceased.

6.4.19.9 While behavioural disturbance may result in short-term disruption to activities such as foraging or resting, and a temporary increase in energetic expenditure (Marley *et al.*, 2017a; Pirotta *et al.*, 2015), although available evidence suggests bottlenose dolphins are capable of compensating for such effects over short temporal and spatial scales (New *et al.*, 2013). These responses are not expected to translate into measurable effects on survival or reproductive success.

6.4.19.10 For bottlenose dolphins, the project-specific mitigation measures set out within the MMMP (NIS Volume III, Appendix 25.2: Marine Mammal Mitigation Plan (Revised March 2026)), although primarily designed to minimise the risk of auditory injury (PTS) arising from piling-related underwater noise, will also act to reduce the magnitude and spatial extent of behavioural disturbance. Measures including pre-activity monitoring and controlled initiation of piling will reduce the likelihood of cetaceans being exposed to the highest sound levels, thereby limiting the potential for strong avoidance or displacement responses. As a result, any behavioural disturbance experienced by cetaceans is expected to be temporary and reversible and not of a scale or duration that would undermine the relevant COs.

6.4.19.11 In relation to the site-specific COs for Lleyn Peninsula and the Sarnau SAC (Table 5.1), the potential effects of behavioural disturbance arising from underwater noise associated with pile driving on bottlenose dolphins have been assessed with respect to anthropogenic disturbance, accessibility to and continued use of supporting habitats, and maintaining the population in favourable condition.

6.4.19.12 While underwater noise generated from piling may result in temporary behavioural responses and localised displacement in a small proportion of individuals, such effects are short-term, reversible, and restricted to the duration of piling activity. Piling will not create a persistent barrier to movement, nor will it significantly constrain bottlenose dolphins from accessing habitats within or outside the SAC that are necessary to maintain the population in favourable condition.

6.4.19.13 The assessment indicates that any disturbance experienced by bottlenose dolphins associated with the Lleyn Peninsula and the Sarnau SAC would not result in significant anthropogenic disturbance at a level capable of affecting residency, survival or reproductive success. Consequently, the population using the SAC is expected to remain stable and able to utilise supporting habitats over the medium and long term.

6.4.19.14 **With consideration of the precautionary nature of the assessment, the recoverable and temporary (although repeated) nature of behavioural disturbance, the inclusion of mitigation measures, and the absence of effects on population viability, it is therefore concluded there will be no AEoI of the bottlenose dolphin feature of the Lleyn Peninsula and the Sarnau SAC / Pen Llyn a'r Sarnau SAC, as defined by its COs, as a result of behavioural disturbance due to underwater noise during pile driving for Project Design Option 1.**

6.4.19.15 **Based on the representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

INJURY AND/OR DISTURBANCE FROM UNDERWATER NOISE FROM UXO CLEARANCE

CONSTRUCTION PHASE ASSESSMENT

AUDITORY INJURY (PTS)

6.4.19.16 Based on the modelling results presented in Table 6.2034: the maximum PTS-onset range for bottlenose dolphins resulting from high order UXO clearance is 840 m, based on the unweighted SPL_{peak} criterion and the largest charge weight modelled (800 kg plus donor). Using the wider SCANS-IV density estimate of 0.2352 animals/km^2, this would result in a maximum of one bottlenose dolphin, representing 0.18% of the reference population of 293 within the Irish Sea MU (IAMMWG, 2023), potentially occurring within the PTS-onset range under a highly precautionary scenario.

6.4.19.17 For low order clearance, the predicted PTS-onset ranges are substantially smaller, with a maximum range of 70 m (Table 6.31). At this range, a maximum of one bottlenose dolphin is predicted to experience PTS (in practice, less than 0.001 of an individual).

Table 6.31: PTS-onset ranges and numbers of bottlenose dolphins modelled to be within range for all potential charge weights

Charge Weight (kg)	Maximum range (km)	Density (animals/km²)	Number of animals[1]	Percentage of reference population[1] (%)
PTS-onset (unweighted SPL_{peak})				
0.5 (low order)	0.07	0.0201	<1	<0.01
		0.2352	<1	<0.01
		0.198099	<1	<0.01
25 + donor	0.26	0.0201	<1	<0.01
		0.2352	<1	0.02
		0.198099	<1	0.01

55 + donor	0.34	0.0201	<1	<0.01
		0.2352	<1	0.03
		0.198099	<1	0.02
120 +donor	0.45	0.0201	<1	<0.01
		0.2352	<1	0.05
		0.198099	<1	0.04
240 + donor	0.56	0.0201	<1	0.01
		0.2352	<1	0.08
		0.116527	<1	0.04
525 + donor	0.73	0.0201	<1	0.01
		0.2352	1	0.13
		0.116527	1	0.11
700 + donor	0.81	0.0201	<1	0.01
		0.2352	1	0.17
		0.116527	1	0.14
800 + donor	0.84	0.0201	<1	0.02
		0.2352	1	0.18
		0.116527	1	0.15
PTS-onset (weighted SELss)				

0.5 (low order)	<0.05	0.0201	<1	<0.01
		0.2352	<1	<0.01
		0.116527	<1	<0.01
25 + donor	<0.05	0.0201	<1	<0.01
		0.2352	<1	<0.01
		0.116527	<1	<0.01
55 + donor	<0.05	0.0201	<1	<0.01
		0.2352	<1	0.01
		0.116527	<1	<0.01
120 +donor	<0.05	0.0201	<1	<0.01
		0.2352	<1	<0.01
		0.116527	<1	<0.01
240 + donor	<0.05	0.0201	<1	<0.01
		0.2352	<1	<0.01
		0.116527	<1	<0.01
525 + donor	0.05	0.0201	<1	<0.01
		0.2352	<1	<0.01
		0.116527	<1	<0.01
700 + donor	0.06	0.0201	<1	<0.01

		0.2352	<1	<0.01
		0.116527	<1	<0.01
800 + donor	0.06	0.0201	<1	<0.01
		0.2352	<1	<0.01
		0.116527	<1	<0.01

[1]*The number of animals disturbed and the reference population are representative of the Irish Sea MU population (IAMMWG, 2023). The number of animals disturbed is not representative of the numbers disturbed within the Lleyn Peninsula and the Sarnau SAC.*

6.4.19.18 The nearest boundary of the Lleyn Peninsula and the Sarnau SAC is located approximately 71.35 km from the Proposed Development. As such, even under the largest charge weight modelled, the predicted PTS-onset ranges for both high-order and low-order UXO clearance do not overlap with the SAC. Therefore, no bottlenose dolphins within the SAC are predicted to experience auditory injury as a result of UXO clearance activities associated with the Proposed Development.

6.4.19.19 The dominant energy produced by high-order detonation occurs at low frequencies, outside the region of greatest hearing sensitivity for bottlenose dolphin (Southall *et al.*, 2019), with a pronounced reduction in energy levels above approximately 5-10 kHz (von Benda-Beckmann *et al.*, 2015; Salomons *et al.*, 2021). This further reduces the likelihood of auditory injury from UXO clearance for bottlenose dolphin.

6.4.19.20 Furthermore, the Developer has committed to the implementation of project-specific mitigation measures for UXO clearance activities, as set out within the MMMP (NIS Volume III, Appendix 25.2: Marine Mammal Mitigation Plan (Revised March 2026)). These measures are designed to minimise the risk of auditory injury (PTS) to marine mammals arising from UXO-related noise and will, as a minimum, adhere to relevant international best practice, including DAHG (2014) guidance ((Table 6.7).

6.4.19.21 In relation to the site-specific COs for Lleyn Peninsula and the Sarnau SAC (Table 5.1), the potential effects of underwater noise associated with UXO clearance on bottlenose dolphin have been assessed with respect to the attributes of access to supporting habitat and ensuring that the population is maintained in favourable condition.

6.4.19.22 UXO clearance events and the associated underwater noise capable of causing auditory injury, would be short-term and highly localised, typically comprising a single, one-off detonation at any given location. As such, UXO clearance would not create a permanent or long-term barrier to the use of supporting habitat within or connected to the SAC, nor would it result in any sustained exclusion of bottlenose dolphins from the wider area.

6.4.19.23 Regarding the population attribute, even in the highly unlikely event that an individual experienced PTS-onset, available evidence indicates that would be unlikely to significantly affect individual fitness (i.e. its ability to survive and reproduce; Kastelein *et al.*, 2017). Therefore, UXO clearance activities are not expected to introduce anthropogenic noise at levels that could affect the population using the site or their residency in the site, and therefore they will not affect the condition of, or the contribution to FCS by, bottlenose dolphins associated with the Lleyn Peninsula and the Sarnau SAC.

6.4.19.24 **With consideration of the very limited spatial extent of predicted auditory injury (PTS-onset) ranges, the absence of overlap with the SAC (with the greatest predicted impact range predicted of up to 840 m), the implementation of mitigation measures, and the negligible proportion of the wider MU potentially affected (0.18%) even under the most precautionary scenario, it is concluded there will be no AEoI of the bottlenose dolphin QI of the Lleyn Peninsula and the Sarnau SAC / Pen Llyn a'r Sarnau SAC, as defined by its COs, as a result of auditory injury due to underwater noise associated with UXO clearance for Project Design Options 1 and 2.**

BEHAVIOURAL DISTURBANCE

6.4.19.25 The estimated number of bottlenose dolphins potentially disturbed as a result of high order UXO detonation, based on the application of a 20 km EDR, is presented in Table 6.22. When using the uniform SCANS-IV density estimate of 0.2352 animals/km^2, it is estimated that up to 273 animals (93.12% of the Irish Sea MU reference population of 293 animals; IAMMWG, 2023) could theoretically be affected under the highly precautionary scenario.

6.4.19.26 This is considered highly conservative, as it assumes uniform densities and does not account for natural variation in coastal and offshore distributions of bottlenose dolphins within the Irish Sea. Large-scale surveys, such as SCANS, used to derive MU population estimates are not designed to capture localised, coastal populations, such as that of Cardigan Bay (alone considered to be 232 individuals; Cuthbertson *et al.*, 2025); therefore, the reference population size is likely under-estimated. A more realistic density estimate using the ObSERVE survey density (Rogan *et al.,* 2018) of 0.0201 animals/km^2, predicts that 23 individuals (7.96% of the MU reference population) could be disturbed by high order UXO clearance (Table 6.32).

6.4.19.27 For low order clearance, application of the 5 km EDR results in an estimated two individuals potentially disturbed, when using the ObSERVE survey density (Rogan *et al.,* 2018) (0.68% of the Irish Sea MU reference population; Table 6.22). It should be noted that this estimate is illustrative only, as there is only limited empirical evidence to support a defined disturbance range for low order UXO clearance.

Table 6.32: Predicted impact of disturbance to bottlenose dolphins from UXO for both high order (20 km) and low order clearance (5 km) EDRs. For further information on densities used, see Table 6.6.

UXO Scenario	EDR	Density (animals/km^2)	Number of animals disturbed[1]	Percentage of the reference population[1] (%)
High Order Clearance	20 km^2	0.0201	23	7.96
		0.2352	273	93.12
		0.198099	230	78.43
Low Order Clearance	5 km	0.0201	2	0.68
		0.2352	19	6.48
		0.198099	16	5.46

[1]The number of animals disturbed and the reference population are representative of the Irish Sea MU population (IAMMWG, 2023). The number of animals disturbed is not representative of the numbers disturbed within the Lleyn Peninsula and the Sarnau SAC.

[2]Reduced EDR to account for land overlap within the nominal 20 km radius (effective area 1,159.98 km^2 rather than 1,256.31 km^2)

6.4.19.28 The nearest boundary of Lleyn Peninsula and the Sarnau SAC is located approximately 71.35 km from the Proposed Development. As such, the EDRs for UXO clearance do not overlap with the SAC. Therefore, no bottlenose dolphins within the SAC are predicted to experience behavioural disturbance as a result of UXO clearance activities associated with the Proposed Development. Any behavioural disturbance associated with UXO clearance, which may occur outwith the site, is expected to be highly localised in time, recoverable, and infrequent during the construction phase, due to the single-pulse nature of UXO clearance.

6.4.19.29 Potential behavioural disturbance to marine mammals arising from UXO clearance activities has been managed through the implementation of the project-specific MMMP (NIS Volume III, Appendix 25.2: Marine Mammal Mitigation Plan (Revised March 2026)), which includes the application of mitigation measures, informed by international best practice including DAHG (2014), to reduce the likelihood, spatial extent and duration of any behavioural responses, such that any disturbance would be temporary, localised and not of a nature that could affect population-level processes (Table 6.7).

6.4.19.30 In relation to the site-specific COs for Lleyn Peninsula and the Sarnau SAC (Table 5.1), the potential effects of underwater noise associated with UXO clearance on bottlenose dolphins have been considered with respect to the attributes of access to supporting habitat and ensuring that the population is maintained in favourable condition.

6.4.19.31 Whilst underwater noise generated from UXO clearance may result in a short-term startle response and temporary displacement of some individuals outside of but associated with the SAC, such disturbance would be brief in duration and would not impede access to the site or constitute a permanent barrier to habitat use of the site.

6.4.19.32 Any individuals disturbed by UXO clearance are not predicted to experience significant negative effects on fitness, survival, or reproductive success for any life stage, nor is the activity expected to result in injury or mortality at a scale capable of affecting the bottlenose dolphin population associated with Lleyn Peninsula and the Sarnau SAC.

6.4.19.33 ~~6.4.18.31~~ **With consideration of the** ~~low sensitivity of the species, high recoverability and adaptability, the short term nature of this impact,~~**precautionary nature of the assessment, the absence of overlap with the SAC, the low proportion of the population predicted to be affected, the implementation of** ~~the MMMP, and the likely underestimation of population numbers and overestimation of proportion disturbed~~**mitigation measures, the short-term and recoverable nature of behavioural disturbance, and the limited frequency of UXO clearance events, it is concluded there** ~~**is**~~**will be no** ~~**potential for**~~ **AEoI** ~~**upon the integrity of**~~**of the bottlenose dolphin QI of the Lleyn Peninsula and the Sarnau SAC / Pen Llyn a'r Sarnau SAC, as defined by** ~~**the**~~**its COs** ~~**of the site**~~**, as a result of behavioural disturbance** ~~**from**~~**due to underwater noise** ~~**impacting bottlenose dolphin from**~~**during UXO clearance for Project Design** ~~**Option**~~**Options 1 and 2.**

CONSTRUCTION PHASE ASSESSMENT

6.4.19.34 The Subsea Noise Assessment (Seiche Ltd., 2022) concluded that PTS-onset ranges from confirmatory site surveys are limited to relatively small distances from the sound source and vary by survey type and marine mammal FHG, with bottlenose dolphins considered under high frequency (HF) cetaceans.

6.4.19.35 While PTS is a permanent effect which cannot be recovered from, animals exposed to noise levels that could induce TTS are likely to avoid hearing damage by moving away from the source (Southall *et al.,* 2007). Like the other underwater noise assessments, whilst the TTS impact ranges are presented here, the resulting implications of TTS are considered alongside behavioural disturbance, reflecting its temporary and recoverable nature and its relevance to short-term changes in behaviour rather than long-term population level effects.

6.4.19.36 Predicted impact ranges for auditory (PTS-onset) and TTS-onset to bottlenose dolphins from site surveys (geophysical and geotechnical surveys) are summarised in Table 6.33. The largest cumulative PTS-onset range is 82 m for SBP surveys, while the largest cumulative TTS-onset range is 352 m. Other survey activities have smaller ranges, typically tens of metres or less (Table 6.23; Seiche Ltd., 2022).

Table 6.33: Predicted maximum impact ranges for bottlenose dolphins from proposed site surveys (Seiche Ltd., 2022)

Survey category	Equipment type	Noise type	Effect	PTS Maximum predicted range (m)	TTS Maximum predicted range (m)
Geophysical	MBES	Non-impulsive	Cumulative	25	26
Geophysical	SSS	Non-impulsive	Cumulative	25	26
Geophysical	SBP	Non-impulsive	Cumulative	82	352
Geophysical	USBL positioning equipment	Non-impulsive	Cumulative	0[1]	50[2]
Geophysical	Seismic refraction	Impulsive	Instantaneous	N/E	N/E
			Cumulative	2	19
Geophysical	Sparker (2DUHRS and 3DUHRS)	Impulsive	Instantaneous	N/E	N/E
			Cumulative	N/E	N/E
Geotechnical	Seismic CPT	Impulsive	Instantaneous	N/E	N/E
			Cumulative	N/E	9
Geotechnical	Vibrocore	Non-impulsive	Cumulative	N/E	N/E

[1]USBL was not included in the Subsea Noise Assessment (Seiche Ltd., 2022) however, CSA Ocean Sciences Inc. (2020) estimated that the maximum distance to the weighted Level A threshold (cumulative PTS) is 0 m for HF (bottlenose dolphin).

[2]Based on maximum distance to all FHG Level B threshold (SPL_{rms}; CSA Ocen Sciences Inc., 2020).

~~6.4.18.32 **Based on the increased risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**~~

6.4.19.37 The nearest boundary of Lleyn Peninsula and the Sarnau SAC is located approximately 71.35 km from the survey area, substantially greater than the maximum predicted PTS- or TTS-onset ranges for all survey activities (Table 6.33). As such, no bottlenose dolphins within the SAC are predicted to experience auditory injury (PTS) or TTS as a result of the site surveys.

6.4.19.38 With consideration that bottlenose dolphins have a lower sensitivity to underwater noise compared to harbour porpoise, the predicted impact ranges for bottlenose dolphin presented in Table 6.33 are smaller compared than those outlined in Table 6.17. The implementation of mitigation measures (Table 6.7), including a project-specific MMMP (NIS Volume III, Appendix 25.2: Marine Mammal Mitigation Plan (Revised March 2026)) during site surveys and adherence to DAHG (2014) guidance, is designed to address exposure under the most precautionary scenario for the most sensitive species with the largest distances i.e. for harbour porpoise. As such, these measures provide a precautionary buffer, and the actual likelihood and spatial extent of PTS-onset for bottlenose dolphins will be further reduced.

6.4.19.39 Predicted behavioural disturbance ranges are greater than PTS/TTS distances, with maximum distances of up to 4.95 km for non-impulsive geophysical survey sound sources (SBP), 700 m for sparker, 1.32 km for seismic refraction, 10 km for vibrocore and 1.5 km for seismic CPT for all marine mammal FHGs (Seiche Ltd., 2022). USBL were not included in the Subsea Noise Assessment (Seiche Ltd., 2022) however, CSA Ocean Sciences Inc. (2020) estimated that the

maximum distance to the Level B threshold (disturbance) is 50 m for all marine mammal hearing groups.

6.4.19.40 While some predicted disturbance ranges extend beyond the Proposed Development boundary, the closest distance to the Lleyn Peninsula and the Sarnau SAC (71.35 km away) remains greater than the predicted disturbance ranges, and any behavioural responses are expected to be short-term and reversible in nature.

6.4.19.41 In relation to the Lleyn Peninsula and the Sarnau SAC site-specific COs (Table 5.1), site survey activities are temporary, intermittent and spatially limited, and are not expected to result in sustained displacement, or permanent habitat exclusion from the site. Any behavioural responses would be brief and limited to very few individuals outside of the SAC, without causing significant effects on individual fitness or population integrity.

6.4.19.42 **With consideration of the limited spatial extent of predicted impact ranges, the absence of overlap with the SAC (with the greatest predicted impact range predicted of 10 km), and the implementation of mitigation measures, it is concluded there will be no AEoI of the bottlenose dolphin QI of the Lleyn Peninsula and the Sarnau SAC / Pen Llyn a'r Sarnau SAC, as defined by its COs, as a result of auditory injury or behavioural disturbance due to underwater noise associated with site surveys during the construction phase for Project Design Options 1 and 2.**

OPERATIONAL AND MAINTENANCE PHASE ASSESSMENT

~~6.4.18.33 There are no piling activities proposed for the Operational and Maintenance phase of the Proposed Development. Any underwater noise produced will be due to vessel movements which is assessed in Section 0 to 0.~~

~~6.4.18.34 **There is no potential for AEoI, as defined by the COs of the site, from underwater noise in the operational and maintenance phase of the Proposed Development on this site and feature for Project Design Option 1.**~~

~~6.4.18.35 **Based on the increased risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**~~

6.4.19.43 Routine geophysical surveys of inter-array, inter-connector, and export cables will occur every six months during the first two years and annually thereafter throughout the operational and maintenance phase of the Proposed Development (Table 6.8).

6.4.19.44 As the exact equipment is not yet confirmed, an assessment has been undertaken assuming the same survey equipment and source level types as that proposed during the pre-construction surveys (Table 6.15 and Table 6.16). Therefore, the impact ranges of auditory injury (PTS), TTS and behavioural disturbance from site surveys during the operational and maintenance phase are expected to be similar to the results of the Subsea Noise Assessment (Seiche Ltd., 2022; CSA Ocean Sciences Inc, 2020) conducted for site surveys during the pre-construction phase.

6.4.19.45 **With consideration of the limited spatial extent of predicted impact ranges, the absence of overlap with the SAC (with the greatest predicted impact range predicted of 10 km), and the implementation of mitigation measures, it is concluded there will be no AEoI of the bottlenose dolphin QI of the Lleyn Peninsula and the Sarnau SAC / Pen Llyn a'r Sarnau SAC, as defined by its COs, as a result of auditory injury or behavioural disturbance due to underwater noise associated with site surveys during the operational and maintenance phase for Project Design Options 1 and 2.**

INJURY AND/OR DISTURBANCE FROM UNDERWATER NOISE DURING DREDGING AND TRENCHING

CONSTRUCTION PHASE ASSESSMENT

6.4.19.46 The Underwater Noise Assessment (NIS Volume III, Appendix 11.1: Underwater Noise Assessment (Revised March 2026)) concluded that for non-impulsive construction activities, including dredging and trenching, cumulative PTS-onset ranges could only occur at very short distances from the sound source. For trenching, backhoe dredging and suction dredging, predicted cumulative PTS- and TTS-onset ranges for bottlenose dolphin (HF FHG; Southall *et al.*, 2019) are less than <50 m.

6.4.19.47 Dredging and trenching activities produce continuous, non-impulsive underwater noise and are not expected to result in auditory injury (PTS) in marine mammals. The dominant energy from these activities typically occurs below 1 kHz (Todd *et al.*, 2015), which lies outside the peak hearing sensitivity range of HF cetaceans such as bottlenose dolphins (Southall *et al.*, 2019). As a result, the potential for PTS (or TTS) to occur from these construction activities is expected to have little relevance to individual fitness, survival or reproductive success, as the hearing sensitivity of these receptors is relatively poor below 1 kHz (Southall *et al.,* 2019).

6.4.19.48 Although PTS is a permanent effect, the combination of very limited spatial extent of predicted PTS-onset ranges and low sensitivity of bottlenose dolphins to low-frequency noise, indicates that dredging and trenching will not result in auditory injury (PTS) at levels that would affect population-level parameters.

6.4.19.49 Information on marine mammal sensitivity to dredging and trenching noise is limited, with available studies focusing primarily on the impact of behavioural disturbance from dredging. However, it is often difficult to distinguish the effects of underwater noise from disturbance associated with vessel presence required to undertake the activity (Todd *et al.*, 2015).

6.4.19.50 Pirotta *et al.* (2013) observed temporary avoidance from foraging areas in Aberdeen Harbour during an increase intensity of dredging activity, with bottlenose dolphins absent from the vicinity for approximately five weeks during the initial dredge operations; however, these individuals followed cessation of activities. In western Australia, Marley *et al.* (2017a), reported variable responses to dredging between sites. No bottlenose dolphins were sighted during backhoe dredging activities at one site, while dolphins remained using the other site despite the same dredging activities occurring, suggesting site- and context-specific behaviours.

6.4.19.51 There are currently no empirical data describing bottlenose dolphin responses specifically to trenching activities. In the absence of such data, it is assumed that behavioural responses and deterrence distances would be limited to within 5 km of the activity (McQueen *et al.*, 2020). Should behavioural disturbance occur, it is expected to be short-term and reversible, with animals returning to the area following cessation of activities.

6.4.19.52 The closest distance between dredging and trenching activities and the boundary of the Lleyn Peninsula and the Sarnau SAC is approximately 71.35 km. This distance substantially exceeds the maximum predicted ranges for PTS-onset, TTS-onset and behavioural disturbance (5 km) associated with dredging and trenching. Therefore no bottlenose dolphins within the SAC are predicted to be affected.

6.4.19.53 In relation to the Lleyn Peninsula and the Sarnau SAC site-specific COs (Table 5.1), dredging and trenching during construction will not result in permanent or long-term restriction of access to supporting habitat within the SAC, nor introduce underwater noise at levels that would adversely affect the bottlenose dolphin population in, or connected to the SAC, through injury or disturbance.

6.4.19.54 **With consideration of the limited spatial extent of predicted auditory injury (PTS-onset) and behavioural disturbance ranges associated with dredging and trenching activities, the**

absence of overlap with the Lleyn Peninsula and the Sarnau SAC (with the greatest predicted disturbance impact range of up to 5 km), and the temporary, localised and reversible nature of any behavioural disturbance, it is concluded that there will be no AEoI of the bottlenose dolphin QI of the Lleyn Peninsula and the Sarnau SAC / Pen Llyn a'r Sarnau SAC, as defined by its COs, as a result of underwater noise arising from dredging and trenching activities during the construction phase for Project Design Options 1 and 2.

OPERATIONAL AND MAINTENANCE PHASE ASSESSMENT

6.4.19.55 During the operational and maintenance phase, dredging and trenching may be required intermittently for scour protection repair and maintenance of foundations and cables. These activities are expected to be localised, short-term and less frequent than those undertaken during the construction phase.

6.4.19.56 Based on the predicted underwater noise modelling presented in the Underwater Noise Assessment (NIS Volume III, Appendix 11.1: Underwater Noise Assessment (Revised March 2026)), the precited ranges for auditory injury (PTS-onset), TTS-onset and behavioural disturbance during operation and maintenance are expected to be comparable to those assessed for the construction phase, as similar equipment and methods are anticipated to be used.

6.4.19.57 The closest distance between dredging and trenching activities during the operational and maintenance phase and the boundary of the Lleyn Peninsula and the Sarnau SAC is approximately 71.35 km. This distance substantially exceeds the maximum predicted ranges for auditory injury (PTS), TTS, and behavioural disturbance associated with dredging and trenching activities.

6.4.19.58 In relation to the Lleyn Peninsula and the Sarnau SAC site-specific COs (Table 5.1), dredging and trenching during construction will not result in restriction of access to supporting habitat within the SAC, nor introduce underwater noise at levels that would adversely affect the bottlenose dolphin population through injury or disturbance.

6.4.19.59 **With consideration of the limited spatial extent of predicted auditory injury (PTS-onset) and behavioural disturbance ranges associated with dredging and trenching activities, the absence of overlap with the Lleyn Peninsula and the Sarnau SAC (with the greatest predicted disturbance impact range of up to 5 km), and the temporary, localised and reversible nature of any behavioural disturbance, it is concluded that there will be no AEoI of the bottlenose dolphin QI of the Lleyn Peninsula and the Sarnau SAC / Pen Llyn a'r Sarnau SAC, as defined by its COs, as a result of underwater noise arising from dredging and trenching activities during the operational and maintenance phase for Project Design Options 1 and 2.**

INJURY AND/ OR DISTURBANCE FROM VESSEL MOVEMENTS

INJURY FROM VESSEL ACTIVITIES

~~6.4.18.36 There will be increased vessel movements compared to baseline levels during all phases of the Proposed Development, which can result in injury and/ or mortality from vessel collision, or disturbance though presence and the generation of underwater noise.~~

~~6.4.18.37 The area surrounding the Proposed Development experiences a relatively low level of vessel traffic due to the presence of the shallow Arklow Bank sandbank, with higher traffic in the coastal areas and immediate surrounding waters.~~

~~6.4.18.38 The shipping and navigation baseline study recorded 29 days of vessel traffic data between 7th July and 14th August 2023. There was an average of 36 to 37 unique vessels per day recorded within the shipping and navigation Study Area (which is defined as Array Area and a 10 nm~~

~~buffer). The busiest day recorded 59 unique vessels within the shipping and navigation Study Area. The main vessel types within the shipping and navigation Study Area were cargo vessels (40%), recreational vessels (31%) and fishing vessels (10%).~~

~~6.4.18.39 During construction of the windfarm, a potential source of impact from increased vessel activity is physical trauma from collision with a boat or ship. In general, three consequences of vessel collision are defined: direct (injuries to the animals that are the immediate result of collision), long-term (a decrease in the fitness of the animal over time), and population consequences (Schoeman et al., 2020). With regards to injuries, both fatal and non-fatal injuries between marine mammals and vessels have been documented (Laist et al., 2001; Vanderlaan et al., 2008; Cates et al., 2017). Fatal collisions have been evidenced via carcasses washing up on beaches (Laist et al., 2001; Peltier et al., 2019); carcasses caught on vessel bows (Laist et al., 2001; Peltier et al., 2019); and floating carcasses which have strong evidence of ship strike, such as propeller cuts, significant bruising, oedema, internal bleeding radiating from a specific impact site, fractures and ship paint marks (Jensen and Silber, 2003; Douglas et al., 2008). Fatalities from ship strikes, however, often go unreported (Authier et al., 2014). For non-fatal injuries, evidence of animals which have survived ship strikes with non-fatal injuries from propellers has been widely documented (Wells et al., 2008; Luksenburg, 2014).~~

~~6.4.18.40 Although many species of marine mammals are able to detect and avoid vessels, it is unclear why some individuals do not always move out of the path of an approaching vessel (Schoeman et al., 2020), although it has been suggested that behaviours such as resting, foraging, nursing, and socialising could distract animals from detecting the risk posed by vessels (Dukas, 2002). It is also possible that animals do not hear vessels when they are near the surface. Collisions between cetaceans and vessels, however, are not necessarily lethal on all occasions.~~

~~6.4.18.41 Whilst a broad range of vessel types have been involved in collisions with marine mammals (Laist et al., 2001), vessels travelling at higher speeds pose a higher risk because of the potential for a stronger strike impact (Schoeman et al., 2020). For example, a study by Laist et al. (2001) found that in 89% of collisions in which the whale was killed or seriously injured, vessels were travelling at speeds of 14 kn (7 m/s) or more, and the vessel exceeded a length of 80 m. Therefore, larger vessels travelling at 7 m/s or faster are those most likely to cause death or serious injury to marine mammals (Laist et al., 2001).~~

6.4.19.60 ~~6.4.18.42~~ Bottlenose dolphins are relatively small ~~and~~, highly mobile, and given observed responses to noise, are ~~expected to detect~~capable of detecting vessels in close proximity ~~and~~, allowing them to largely avoid ~~collision~~collisions.

6.4.19.61 ~~6.4.18.43~~ There is ~~a lack of~~limited information on the frequency of marine mammal vessel collisions ~~with marine mammals in the~~in Irish waters, and ~~there is a lack of~~stranding data provide little evidence ~~from marine mammals stranded in the Irish sea to suggest~~ that injury from vessel collisions ~~is an important~~are a significant cause of marine mammal mortality~~. In the UK, the Cetacean Strandings Investigation Programme (CSIP) documents the annual number of reported strandings and the cause of death for those individuals examined at post-mortem. Based on the most recent CSIP report for~~ in the region. In 2018, CSIP recorded nine bottlenose dolphin~~, post-mortems were conducted on one out of the nine reported strandings in 2018~~ strandings, of which only one underwent a post-mortem; the cause of death in this case was not associated with vessel collision (CSIP, 2019). ~~With consideration of the low numbers of bottlenose dolphins stranded we also looked at the post-mortems for common dolphin~~ On a precautionary basis~~. Post-mortems were conducted on 45 out of the 191 reported strandings in 2018 and a cause of death was~~, post-mortem data for short-beaked common dolphin (*Delphinus delphis*) were also considered. In 2018, 191 strandings were reported, with 45 individuals examined; causes of death were established for 43 ~~individuals~~animals (CSIP, 2019). Of these, two individuals ~~had~~ died from physical trauma of ~~an~~ unknown ~~cause~~origin, which could have ~~been due to~~included vessel strike, but this is not confirmed (CSIP, 2019)~~, however this is unknown. With consideration~~. Considering

that only ~~2~~two of the 43 ~~individuals where it was possible the conclude the cause of death had the~~examined cases had potential ~~to be caused by~~, but unconfirmed, links to vessel collision, it is concluded that vessel ~~collisions~~strikes are not a significant cause of mortality ~~within~~for dolphins in the Irish Sea ~~with dolphins.~~

~~6.4.18.44 Overall, the assessment concludes that there is a high likelihood that bottlenose dolphin will avoid vessels and therefore collision risk is viewed as negligible, although they have a high sensitivity to the impact should it occur.~~

CONSTRUCTION AND DECOMMISSIONING PHASE ASSESSMENT

6.4.19.62 During the construction phase, up to 69 installation vessels may be present within the Proposed Development at any one time, resulting in a maximum of 4,150 vessel return trips over the four-year construction period, and a maximum of 1,797 vessel return trips per year. A similar number of vessels are anticipated for the decommissioning phase.

6.4.19.63 The majority of vessels used during the construction and decommissioning phase are likely to be large installation vessels that will operate at relatively low speeds or remain stationary for extended periods of time. The key collision risk threshold for large vessels is generally associated with speeds exceeding approximately 7 m/s; however, such speeds are not anticipated to be routinely exceeded during construction or decommissioning activities. Consequently, increases in vessel traffic within the Proposed Development and along transit routes will be intermittent and largely confined to discrete periods of offshore activity.

6.4.19.64 Smaller vessels associated with construction and decommissioning activities (i.e. tug/anchor handlers, guard vessels, survey vessels, and crew transfer vessels) are more manoeuvrable than larger installation vessels and are therefore better able to avoid marine mammals when detected, even when an animal is close and the vessel is going at higher operating speed (Schoeman *et al.*, 2020). In contrast, larger vessels, such as jack-up vessels, have reduced manoeuvrability and may require larger distances to avoid an animal, but travel at slower speeds, reducing collision risk.

6.4.19.65 In addition, the mitigation measures (see Table 6.7), which includes an Environmental VMP (NIS Volume III, Appendix 25.10: Environmental Vessel Management Plan), will ensure that vessel traffic will move along predictable routes, which is known to be a key aspect in minimising the potential risk of injuries imposed by vessel traffic (Nowacek *et al.*, 2001; Lusseau, 2003; 2006).

6.4.19.66 Construction and decommissioning vessel noise is expected to be detectable by marine mammals and is therefore likely to facilitate avoidance behaviour by bottlenose dolphin. Although construction will result in a temporary increase in vessel activity, vessel movements will be largely restricted to the Array Area, Cable Corridor and Working Area, and will generally follow existing shipping routes to and from port. Given the high levels of baseline vessel traffic in the Irish Sea, the introduction of construction and decommissioning vessels is not considered to represent a novel or atypical pressure for bottlenose dolphins in the region. Accordingly, vessel activity associated with the Proposed Development is not expected to materially increase the risk of injury from vessel activities.

6.4.19.67 With consideration of the mobility of bottlenose dolphins, the nature of construction and decommissioning vessel traffic, distance from the SAC (71.35 km) and the implementation of Environmental VMP measures, vessel movements are not expected to result in reduced access to habitat, or effects on the favourable condition of the population**. It is therefore concluded that there will be no AEoI of the bottlenose dolphin QI of the Lleyn Peninsula and the Sarnau SAC / Pen Llyn a'r Sarnau SAC, as defined by its COs, as a result of injury from vessel activities associated with the construction and decommissioning phase for Project Design Option 1 and 2.**

OPERARTION AND MAINTENANCE PHASE ASSESSMENT

6.4.19.68 During the operational and maintenance phase, a maximum of 30 vessels will be present within the Proposed Development at any one time, resulting in a maximum of 1,359 vessel return trips per year. Vessels that will be used during the operational and maintenance phase (up to 36.5 years) include crew transfer vessels, jack-up vessels, cable repair vessels.

6.4.19.69 As with construction and decommissioning activities, vessels operating during the operational and maintenance phase are expected to travel at relatively low speeds within the Proposed Development, with larger vessels either stationary or operating at slow speeds during maintenance activities. Smaller, more manoeuvrable vessels (e.g. crew transfer vessels) are able to alter course to avoid marine mammals when detected. Bottlenose dolphins are therefore expected to detect and avoid vessels, resulting in a low likelihood of collision.

6.4.19.70 The continued implementation of mitigation measures, including the Environmental VMP (NIS Volume III, Appendix 25.10: Environmental Vessel Management Plan; Table 6.7), will ensure predictable vessel routing and adherence to appropriate vessel management procedures, further reducing collision risk. Given the lower vessel numbers relative to construction, the absence of novel vessel activity, and the high baseline levels of vessel traffic in the Irish Sea, vessel movements during operation and maintenance are not expected to materially increase collision risk for bottlenose dolphins.

6.4.19.71 Given the relatively low number of vessel activity, the intermittent nature of any operation and maintenance activities, and continued application of Environmental VMP measures, vessel movements during operational and maintenance phase will not result in reduced access to habitats, or effects on the favourable condition of the population. **Therefore, it is concluded that there are no AEoI of the bottlenose dolphin QI of the Lleyn Peninsula and the Sarnau SAC / Pen Llyn a'r Sarnau SAC, as defined by its COs, as a result of injury from vessel activities associated with the operational and maintenance phase for Project Design Options 1 and 2.**

VESSEL DISTURBANCE

6.4.19.72 ~~6.4.18.45~~ With regards to ~~behavioural changes due to~~ vessel ~~movements~~disturbance, studies ~~on the interactions of~~examining bottlenose ~~dolphins with vessels have shown various responses.~~dolphin responses to vessel presence consistently show that behavioural disturbance, where it occurs, is typically short-term, context-specific, and limited to the period when vessels are present. Acoustic monitoring in the Moray Firth, ~~a passive acoustic monitoring study showed that the presence of vessels resulted in a short-term~~Scotland, demonstrated a temporary reduction in foraging activity by 49%~~, with animals~~ during vessel presence, with bottlenose dolphins resuming foraging ~~after~~behaviour once the vessel had travelled through the area, ~~suggesting~~indicating that disturbance was ~~limited to the time the vessel was physically present~~transient and localised (Pirotta *et al.*, 2015). As a result, the study concluded that the physical presence of vessels plays a larger role in disturbance, as vessel noise was not taken into consideration (Pirotta *et al.*, 2015).

~~6.4.18.46 In a modelling study by Lusseau et al. (2011), it was predicated that increased vessels movements associated with offshore wind development in the Moray Firth did not have a negative effect on the local population of bottlenose dolphins, although it did note that foraging may be disrupted by disturbance from vessels. Mathematical modelling was also conducted by New et al. (2013) to simulate the complex interactions of the bottlenose dolphin population in the Moray Firth and determine whether an increased rate of disturbance from vessel traffic from proposed offshore developments was biologically significant. The study statistically modelled an increase in vessel traffic from 70 to 470 vessels per year and found that an increase in commercial vessel traffic alone will not result in a biologically significant increase in disturbance, because dolphins~~

~~have the ability to compensate for their immediate behavioural response. Therefore, their health and vital rates were predicted to be unaffected (New et al., 2013).~~

6.4.19.73 Modelling studies further indicate that increases in vessel traffic do not necessarily translate into biologically significant population-level effects. In the Moray Firth, modelling of increased vessel movements associated with offshore wind development found no predicted negative effects on the local population of bottlenose dolphins, despite short-term disruptions to foraging (Lusseau *et al.*, 2011). Similarly, New *et al.* (2013) modelled a substantial increase in vessel traffic (from 70 to 470 vessels per year) and concluded that bottlenose dolphins were able to compensate for short-term behavioural responses, with no predicted effects on health or vital rates.

6.4.19.74 ~~6.4.18.47~~ Bottlenose dolphins are also considered to tolerate vessel activity in areas with long-standing or consistently high vessel traffic. For example, bottlenose dolphins have ~~also~~ been observed ~~tolerating vessel disturbance, particularly in areas where vessel traffic has always been high~~persisting in heavily trafficked areas such as the Moray Firth (Pirotta *et al.* 2013)~~. Similarly,~~ and Broadhaven Bay (northwest Ireland), where the presence of bottlenose dolphin was positively correlated with overall vessel number during the construction works of an oil pipeline ~~in Broadhaven Bay, northwest Ireland (Anderwald et al., 2013). However, it was unclear whether the bottlenose dolphins were attracted to the vessels themselves or to particularly high prey concentrations within the study area~~, although this may have also reflected local prey availability at the time (Anderwald *et al.*, 2013).

~~6.4.18.48 A study of Indo-Pacific bottlenose dolphin habitat occupancy along the coast of Western Australia found dolphin density to be negatively affected by vessels at one site, but no significant impact at the other (Marley et al., 2017a). It is hypothesised that the quality of the habitat impacts the behavioural response to disturbance as the latter habitat is a known foraging area. Other studies along the coast of Western Australia have found that increased vessel presence was associated with significantly increased swim speeds for individuals when resting or socialising (Marley et al., 2017b). Animals exposed to high levels of shipping traffic were also found to spend more time travelling and less time resting or socialising. The study also found that the whistle characteristics changed with increased broadband exposure, with the greatest variation occurring in the presence of low frequency noise (Marley et al., 2017b). Other studies have reported similar findings, for example, common bottlenose dolphins in Galveston Ship Channel, USA, found that the presence of vessels was associated with significantly less foraging and socialising activity (Piwetz, 2019). For this population, a significant increase in swimming speeds was observed during the presence of recreational and tourism vessels, and shrimp trawlers (Piwetz, 2019).~~

6.4.19.75 ~~6.4.18.49~~ Bottlenose dolphins have also been known to exhibit different behavioural responses ~~to different~~depending on vessel ~~types~~type and activity. A study conducted in New Zealand showed that bottlenose dolphin resting behaviour decreased as the number of dolphin-watching tour boats increased (Constantine *et al.*, 2004)~~. In a~~, while another study conducted in Italy~~, dolphins exhibited an~~ have shown avoidance ~~response to~~of fast motorboats~~,~~ but ~~changed their~~altered acoustic behaviour in the presence of trawlers, likely as a compensatory response to ~~trawler vessels, presumably to compensate for masking~~masking noise (La Manna *et al.*, 2013). ~~This study also found that bottlenose dolphins would tolerate vessel presence within certain levels and were more likely to leave an area if disturbance was persistent (La Manna et al., 2013). Therefore, the degree to which an individual is disturbed is likely linked to their baseline level of tolerance (Bejder et al., 2009).~~

~~6.4.18.50 With consideration of the studies, it is concluded that bottlenose dolphin have a low sensitivity to impacts from vessel movements, with reasonable adaptability, tolerance and high recoverability from the potential disturbance.~~ ~~**Therefore, there is no AEoI on the Lleyn Peninsula and the Sarnau/ Pen Llyn a'r Sarnau SAC, as defined by the COs of the site, as a result of injury or disturbance from vessel movement.**~~

6.4.19.76 Evidence from Western Australia and the USA indicates that responses to vessel disturbance are highly context dependent, influenced by habitat quality and behavioural state. In some locations, vessel presence was associated with reduced habitat use or increased swimming speeds, while in others no significant effects were observed, particularly in important foraging habitats (Marley *et al.*, 2017a; 2017b). Changes in activity budgets (e.g. less resting or socialising, more travelling) and vocal behaviour have been reported under high vessel exposure, particularly in the presence of low-frequency noise (Marley *et al.*, 2017b; Piwetz, 2019).

6.4.19.77 Overall, the available evidence indicates that while vessel presence can result in temporary behavioural disturbance, bottlenose dolphins demonstrate a high capacity for behavioural flexibility and compensation. Disturbance effects are generally short-lived, reversible, and unlikely to result in population-level consequences, particularly where vessel activity is intermittent, predictable, and occurs in areas already subject to regular marine traffic.

CONSTRUCTION AND DECOMMISSIONING PHASE ASSESSMENT

6.4.19.78 ~~6.4.18.51~~ During the construction phase, ~~a maximum of 66~~up to 69 installation vessels ~~will~~may be present within the Proposed Development at any one time, resulting in a maximum of 4,150 vessel return trips over the ~~five-year~~four-year construction period, and a maximum of 1,797 vessel return trips per year. A similar number of vessels are anticipated for the decommissioning phase.

~~6.4.18.52 The majority of vessels used during the construction phase are likely to be large vessels that will either be travelling considerably slower than 7 m/s (the key risk is when this speed is exceeded with large vessels) or will be stationary for significant periods of time. Therefore, the actual increase in vessel traffic moving within the Proposed Development and to/from port will occur over short periods of the offshore construction activity. Smaller vessels involved in construction activities (i.e. tug/anchor handlers, guard vessels, survey vessels, and crew transfer vessels) are able to move to avoid marine mammals (when detected), even when an animal is close and the vessel is going at high speed, due to better manoeuvrability compared to larger vessels (Schoeman et al., 2020). In contrast, large vessels, such as jack-up vessels, have low manoeuvrability and may require larger distances to avoid an animal, but travel at slower speeds. In addition, the factored-in measures (see~~ Table 6.7~~) which includes an Environmental VMP (EVMP), will ensure that vessel traffic will move along predictable routes, which is known to be a key aspect in minimising the potential risks imposed by vessel traffic (Nowacek et al., 2001; Lusseau 2003; 2006) and most importantly with regards to collision risk, at reduced speeds. The EVMP also sets out a Code of Conduct to minimise interactions with marine mammals and to define how vessels should behave in the presence of them.~~

~~6.4.18.53 It is also anticipated that noise produced by the vessels will be detectable by the bottlenose dolphin and therefore enable avoidance.~~

~~6.4.18.54 **It is concluded that there is no potential for AEoI upon the integrity of Lleyn Peninsula and the Sarnau/ Pen Llyn a'r Sarnau SAC as defined by the COs of the site, as a result of injury from vessel collision impacting bottlenose dolphin from Project Design Option 1.**~~

~~6.4.18.55 **Based on the increased risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**~~

6.4.19.79 ~~6.4.18.56~~ With consideration of disturbance and displacement, the coastal areas and immediate surrounding waters of the Proposed Development are already subject to high levels of vessel traffic~~. With consideration of this, it is concluded that it is unlikely there will be a~~ (see EIAR Volume II, Chapter 15: Shipping and Navigation (Revised March 2026)). Accordingly, the introduction of construction and decommissioning vessels is not considered to represent a novel or significant change in the level of disturbance that bottlenose ~~dolphin~~dolphins naturally present are subject to.

6.4.18.57 The EVMP will serve to ensure that vessels follow predictable routes in addition to setting out how the vessels should behave in the presence of the species. It is concluded that any disturbance above current baseline levels of activity will only result in a short-term and temporary impact on behaviour. The proposed implementation of a EVMP will reduce the risk of vessel disturbance by controlling the speed and movement of vessels, resulting in slower moving vessels travelling more predictable routes which are less likely to cause disturbance. This is supported by vessel simulation modelling by Findlay et al. (2023) which predicted that, when animals were exposed to vessels at a given distance with both a 20% and a 50% reduction in speed, all potential noise impacts were reduced. At a 20% reduction in speed, the vessel noise swath halved, reducing the average number of animals exposed by 50% and therefore reducing the number of animals that are likely to be disturbed (Findlay et al., 2023). In addition, the study demonstrated that moderate slowdowns strongly reduce vessel source levels, with a 20% reduction in speed decreasing mean source levels by 6 dB and a 50% speed reduction by 18 dB (Findlay et al., 2023).

6.4.19.80 Mitigation measures, including implementation of the Environmental VMP (NIS Volume III, Appendix 25.10: Environmental Vessel Management Plan), will ensure that vessels operate along predictable routes and at controlled speeds (Table 6.7). Predictable vessel movements and reduced speeds are recognised as key factors in minimising disturbance to marine mammals. Vessel simulation modelling indicates that reducing vessels speeds by 20-50% can reduce source noise by approximately 5 - 18 dB and reduce the number of animals exposed, thereby decreasing the likelihood and severity of disturbance (Findlay *et al.*, 2023).

6.4.19.81 In relation to the Lleyn Peninsula and the Sarnau SAC site-specific COs (Table 5.1), vessel movements associated with construction and decommissioning will not result in long-term displacement, sustained disturbance, or restriction of access to supporting habitat, nor will they adversely affect the ability of the bottlenose dolphin to be maintained in favourable condition.

6.4.19.82 6.4.18.58 **With consideration of** our conclusions above that bottlenose dolphins have low sensitivity and when considering the EVMP and baseline levels of disturbance**the temporary and reversible nature of behavioural responses, the localised extent of the disturbance expected, and the implementation of Environmental VMP measures to reduce risk, it is concluded that there will be no AEoI upon the integrity ofof the bottlenose dolphin QI of the Lleyn Peninsula and the Sarnau SAC / Pen Llyn a'r Sarnau SAC, as defined by theits COs of the site, as a result of disturbance from vessel movement impacting bottlenose dolphin fromactivities associated with the construction and decommissioning for Project Design OptionOptions 1 and 2.**

6.4.18.59 **Based on the increased risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

OPERATIONAL AND MAINTENANCE PHASE ASSESSMENT

6.4.19.83 6.4.18.60 During the operational and maintenance phase, a maximum of 2230 vessels will be present within the Array AreaProposed Development at any one time, resulting in a maximum of 1,2941,359 vessel return trips per year. With consideration that this is a significant reduction in the number of vessels present in comparison to the construction and decommissioning phase it is concluded that based on the assessment for that phase, there is no potential for a significant effect.

6.4.19.84 Vessel activity during the operational and maintenance phase represents a reduction in both vessel numbers and activity intensity compared to the construction and decommissioning phases. As during construction, all vessel movements will be subject to the Environmental VMP (NIS Volume III, Appendix 25.10: Environmental Vessel Management Plan; Table 6.7), ensuring predictable routing, controlled speeds and adherence to mitigation measures designed to minimise disturbance to marine mammals.

6.4.19.85 Given the relatively low number of vessel present, slow vessel speeds, and similarly mitigated (Environmental VMP), and evidence that behavioural responses to vessel presence are temporary and localised, any disturbance to bottlenose dolphins during the operational and maintenance phase is expected to be short-term and fully reversible, with animals returning to the area following any displacement due to vessel passage. There is therefore no mechanism by which vessel movements could constrain bottlenose dolphin in their use of habitats or comprise significant anthropogenic disturbance, nor affect the maintenance of the bottlenose dolphin population in favourable condition.

6.4.19.86 ~~6.4.18.61 **Therefore, it is**~~Vessel movements associated with the operational and maintenance phase will not restrict access to supporting habitat or adversely affect population condition. **It is therefore concluded that there ~~are~~will be no AEoI ~~upon the integrity of~~of the bottlenose dolphin QI of the Lleyn Peninsula and the Sarnau SAC / Pen Llyn a'r Sarnau SAC, as defined by ~~the~~its COs ~~of the site~~, as a result of disturbance ~~or collision risk~~ from vessel ~~movement impacting bottlenose dolphin from~~activities associated with the operational and maintenance phase of Project Design ~~Option~~Options 1 ~~in this phase~~and 2.**

~~6.4.18.62 **Based on the increased risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**~~

CHANGES IN EMF FROM SUBSEA CABLING

6.4.19.87 ~~6.4.18.63 The conduction of electricity through~~The operation of subsea power cables ~~has the potential for emit~~generates localised EMF, which ~~has the potential to affect the sensory mechanisms of bottlenose dolphins~~are strongest immediately adjacent to the inter-array, export, and OSP interconnector cables and attenuate rapidly with distance from the buried cable (CMACS, 2003; ~~Copping, 2018;~~ Normandeau *et al.,* 2011)~~, though the effects are not well understood. This impact may only occur~~. Any EMF generation occurs during the operational and maintenance phase of the Proposed Development when ~~there is~~ power ~~generation occurring~~is being transmitted (Table 6.8).

OPERATIONAL AND MAINTENANCE PHASE ASSESSMENT

~~6.4.18.64 Anthropogenic sources of EMF are primarily subsea cables used for power generation and telecommunications or submarine communications (Normandeau et al., 2011). Therefore, the presence and operation of between 110 and 122 km of 66 kV inter-array cables, between 35 and 40 km of 220 kV offshore export cables, and between 25 and 28 km of 220 kV OSP interconnector cables during the lifetime of the Proposed Development may lead to localised EMF effects on marine mammals.~~

~~6.4.18.65 Submarine cables can cause three different types of EMFs: electrical (E) fields, magnetic (B) fields, and induced electric (iE) fields. E-fields are measured in volts per metre (V/m) and are generated by the voltage of the cable. B-fields are measured in microtesla (μT) or milligauss (mG) where 1 μT = 10 mG and are generated by the current of the power through the cable. They attenuate both horizontally and vertically away from the cable, with field strength directly related to the power of the current passing through the cable, rather than being specifically related to the voltage. iE-fields are measured in V/m and are generated by the fluctuation of the B-fields (in AC transmission) or by the motion of the seawater (or an organism) through the B-field. Therefore, they are dependent on the strength of the B-field, thus the strength of the iE-field is directly related to the B-field, which is strongest closest to the cable, attenuating horizontally and vertically away from it.~~

~~6.4.18.66 EMFs also occur naturally in the marine environment from a variety of sources including background levels from the Earth's magnetic field, and very small fields generated by electrical currents moving through organisms (Tricas and Gill, 2011). The Earth's static B-field is present~~

in both terrestrial and aquatic environments and lies in the range 25 to 65 µT (Hutchison et al., 2018). The B-field strength of the Irish Sea is approximately 49 µT (National Oceanic and Atmospheric Administration (NOAA), 2020).

6.4.18.67 Measurements of EMF for subsea cables associated with offshore windfarms vary, with the strength of the B-field generated generally related to the wind speed captured by the turbines. A variety of design and installation factors affect EMF levels in the vicinity of the cables such as current flow, distance between cables, cable insulation, number of conductors, configuration of cable and burial depth. For example, EMFs produced by inter-array cables are smaller than those of export and OSP interconnector cables as they are lower powered in comparison. Furthermore, the B-fields generated by High Voltage Alternating Current (HVAC) and High Voltage Direct Current (HVDC) cables are significantly different, with HVDC cables typically generating much larger EMFs than HVAC cables (Tricas and Gill, 2011). The transmission system used for the Proposed Development will only comprise HVAC.

6.4.18.68 CMACS (2003) reported that for a 132 kV three-phase AC cable with perfect shielding, the predicted B-field in close proximity to the cable was 1.6 µT and the respective iE-field was 91.25 µV/m above the cable if buried to 1 m depth, which reduced to 10 µV m-1 8 m from the cable. Gill et al. (2009) measured iE-fields of 30 µV/m and 110 µV/m at two different offshore windfarm cables (both three-phase AC, 36 kV, 100 A) close to the cables and B-fields of 0.23 µT and 6.5 µT, respectively. Continental Shelf Associates (CSA, 2019) compared offshore windfarm subsea cables and found EMF levels directly over live AC undersea power cables associated with offshore wind energy projects ranged between 5 to 15 mG (0.5 to 1.5 µT) for inter-array cables and 10 to 40 mG (1 to 4 µT) for export cables, at heights of 1 m above the seabed. At lateral distances of between 3 m and 7.5 m from the cable, B-fields greatly reduced to <0.1 to 7 mG (<0.01 to 0.7 µT) for inter-array cables, and <0.1 to 12 mG (<0.01 to 1.2 µT) for export cables, at heights of 1 m above the seabed. Measurements of the iE-fields directly over live AC undersea power cables in the same study ranged between 0.1 to 1.2 mV/m for the inter-array cables and 0.2 to 2.0 mV/m for export cables, at heights of 1 m above the seabed (CSA, 2019). At lateral distances of between 3 m and 7.5 m, iE-fields reduced to between 0.01 to 0.9 m V/m for inter-array cables and 0.02 to 1.1 mV/m for export cables at heights of 1 m above the seabed.

6.4.18.69 The strength of the B-field (and consequently, iE-fields) decreases rapidly horizontally and vertically with distance from source (Normandeau et al., 2011). Burial of cables, in particular, can therefore reduce the strength of the B- and iE-fields. However, it is unlikely that cables can be buried to sufficient depths that will reduce the magnitude of the B-field, and hence the sediment-seawater interface iE-field, to the extent that these fields could not be detected by certain marine organisms on or close to the seabed (Gill et al., 2005). A study conducted by CSA (2019) found that inter-array and export cables buried between depths of 1 m to 2 m reduces the magnetic field at the seabed surface four-fold. For cables that are unburied and instead protected by thick concrete mattresses or rock berms, the field levels were found to be similar to buried cables.

6.4.18.70 Overall, based on the above assessment it is concluded that any potential impact will be highly localised, with strength dissipating rapidly with distance from the buried cables.

6.4.19.88 6.4.18.71 There is evidence to suggest that some species of cetacean may be able to detect variations in magnetic fields, therefore it is plausible that they are magneto-sensitive (Normandeau *et al.*, 2011). Kirschvink et al. (1986) suggested thatBottlenose dolphins have been proposed as a species that werecould theoretically be sensitive to changes in the Earth's magnetic field and that are likely to be present within the Proposed Development include bottlenose dolphin. However, the majority of these have had a theoretical evidence base, coming tofields (Kirschvink *et al.*, 1986); however, the evidence base remains theoretical, and studies have reached differing conclusions regarding speciescetaceans' sensitivity to changes in electric and magnetic fields (Normandeau *et al.*, 2011). To date, the only confirmed evidence of electro-sensitivity in marine mammals to date is reported inrelates to Guiana dolphin (Sotalia guianensis)

~~as they have been shown to~~, which possess ~~an~~a specialised electroreceptive system ~~which is used to detect electrical stimuli~~ (Czech-Damal *et al.*, 2013).

6.4.19.89 ~~6.4.18.72~~ Potential responses of cetaceans from EMF could include avoidance behaviour, disruption in orientation, and effects on feeding or social interaction (Normandeau *et al.*, 2011)~~,~~; however, these remain unproven. Although ~~it is important to note that these responses are all currently hypothetical. Whilst~~ subsea cables ~~could~~may create a very localised ~~change in~~alteration to the geomagnetic field (Taormina *et al.*, 2018), modelling studies ~~of EMF from cables suggests that the likelihood of such a change affecting a~~indicate that EMF effects attenuate rapidly with distance and are unlikely to affect a sufficiently large ~~enough~~ area to elicit ~~a~~biologically significant ~~course alteration would be low~~behavioural responses (Normandeau *et al.*, 2011).

~~6.4.18.73 With consideration that the evidence of impact is only theoretical, and the highly localised nature of potential impacts, and the impacts are recoverable, it is concluded that any EMF effects, if there are any at all, are entirely negligible of impacting this QI.~~

6.4.19.90 Furthermore, given there is no overlap of the Array Area and Cable Corridor and Working Area with the Lleyn Peninsula and the Sarnau SAC, any EMF generated from subsea cables would be well beyond the range at which it could influence bottlenose dolphins within the SAC or affect individuals functionally connected to the site.

6.4.19.91 ~~6.4.18.74~~ ~~**Therefore**~~Considering the Lleyn Peninsula and the Sarnau SAC site-specific COs (Table 5.1), EMF associated with subsea cabling would not result in disturbance or reduction of access to habitats for bottlenose dolphin, nor effects on their favourable condition. **Given the highly localised and theoretical nature of the effect, the absence of spatial overlap with the SAC, it is concluded that there ~~would~~will be no AEoI ~~upon the integrity of~~of the bottlenose dolphin QI of the Lleyn Peninsula and the Sarnau SAC / Pen Llyn a'r Sarnau SAC, as defined by the COs, as a result of ~~the site, from~~ EMF ~~impacting bottlenose dolphin~~ from subsea cables for Project Design ~~Option~~Options 1 ~~in this phase~~and 2.**

~~6.4.18.75 **Based on the increased risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**~~

CHANGES IN FISH AND SHELLFISH COMMUNITY AFFECTING PREY RESOURCES

6.4.19.92 Potential impacts to prey resources arising from the Proposed Development are expected to be largely restricted to the boundaries of the Proposed Development due to the localised footprint of seabed disturbance, the temporary nature of construction activities, and the limited spatial extent of predicted underwater noise and sediment dispersion effects. Any indirect effects on bottlenose dolphin via changes in prey availability would therefore be limited to individuals foraging within, or close proximity to the Proposed Development.

6.4.19.93 ~~6.4.18.76~~ Bottlenose dolphin are ~~primarily dependent on poor cod, salmonids, sandeel, dragonet, whiting, bib~~known to consume a wide variety of prey species, including whiting, blue whiting, ~~haddock,~~ pollock, saithe, ~~herring, rockling, Norway pout, mackerel, hake, eels, wrasse, perch, sole, halibut, dab,~~haddock, poor cod, European hake (*Merluccius merluccius*), Atlantic horse mackerel, a variety of flatfish species, and cephalopods such as pelagic squid ~~species~~ and octopus species ~~for food (Gosch et al., 2014; Wilson and Hammond, 2019). This demonstrates a very highly varied diet and ability to adapt to changes in availability of prey types where needed and so we view bottlenose dolphin as~~(Hernandez-Milian *et al.*, 2011; 2015). This broad prey spectrum demonstrates a high degree of dietary flexibility, and bottlenose dolphins are therefore considered generalist feeders.

CONSTRUCTION AND DECOMMISSIONING PHASE ASSESSMENT

6.4.19.94 Bottlenose dolphin have a generalist diet, as can also be said for other Annex II marine mammal species including harbour porpoise. The assessment of the impact from changes in prey to the

harbour porpoise QI of Blackwater Bank SAC has been undertaken at a high-level across changes to the prey community, rather than reflecting species-specific prey preferences. It is also highlighted that the diet of harbour porpoise (predominantly whiting, Atlantic herring, and poor cod) has overlap with that of bottlenose dolphin. Accordingly, the assessment of changes in the fish and shellfish community affecting prey resources for the Blackwater Bank SAC are considered applicable to SACs for bottlenose dolphin, including Lleyn Peninsula and the Sarnau SAC.

6.4.19.95 ~~6.4.18.77 Impacts to prey resources will be largely restricted to the boundaries of the Proposed Development and, therefore, bottlenose dolphin occurring within this area also have the potential to be impacted. Prey species for bottlenose dolphin are subject to the same impacts as the prey species as the other Annex 2 marine mammal species considered within this assessment (grey seal, harbour porpoise and harbour seal). A full assessment on the impacts of the Proposed Development on prey species has been considered within the~~Potential impacts on prey species associated with construction and decommissioning activities are not specific to bottlenose dolphins and have been comprehensively assessed for other Annex II marine mammal receptors, notably harbour porpoise within Blackwater Bank SAC~~, which~~ (Section 6.4.1). Blackwater Bank SAC is located ~~19.76~~approximately 19.13 km from the Proposed Development, ~~significantly~~substantially closer than the Lleyn Peninsula and the Sarnau~~/ Pen Llyn a'r Sarnau SAC (73.32 km).~~ SAC (approximately 71.35 km). The conclusions of that assessment are therefore considered precautionary when applied to the bottlenose dolphin QI associated with Lleyn Peninsula and the Sarnau SAC.

6.4.19.96 As detailed in Section 6.4.1 and EIAR Volume II, Chapter 10: Fish, Shellfish and Sea Turtle Ecology (Revised March 2026), potential effects on prey species include temporary habitat disturbance, increased SSC and associated deposition, injury and/or disturbance as a result of underwater noise and vibration, and accidental pollution. These effects are predicted to be highly localised, temporary and recoverable, and affecting only a very small proportion of the prey habitat of bottlenose dolphin.

6.4.19.97 Given their generalist foraging strategy and ability to switch between prey types, bottlenose dolphins are considered to have a low sensitivity to localised or short-term changes in prey availability. The predicted scale, duration and spatial extent of impacts on fish and shellfish communities are not expected to result in any meaningful reduction in prey availability or accessibility at a scale relevant to the bottlenose dolphin population associated with the Lleyn Peninsula and the Sarnau SAC.

6.4.19.98 ~~6.4.18.78 **Therefore, it is concluded that there is no AEoI upon the integrity of**~~In the context of the Lleyn Peninsula and the Sarnau SAC site-specific COs, construction and decommissioning activities will not adversely affect prey availability, habitat quality or the ability of bottlenose dolphins to access resources necessary to maintain the population in favourable condition. **It is concluded that there will be no AEoI of the bottlenose dolphin QI of the Lleyn Peninsula and the Sarnau SAC / Pen Llyn a'r Sarnau SAC, as defined by ~~the~~its COs ~~of the site, from~~, as a result of changes in prey ~~impacting bottlenose dolphin from~~resources associated with the construction and decommissioning phases for Project Design Option 1 ~~in this phase~~.**

6.4.19.99 ~~6.4.18.79~~ **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

OPERATIONAL AND MAINTENANCE PHASE ASSESSMENT

6.4.19.100 During the operational and maintenance phase, potential effects on prey species would be limited to intermittent and localised activities such as maintenance dredging or trenching associated with cable or foundation repair. These activities would be infrequent, short-term and

spatially restricted, and would represent a substantial reduction in intensity and extent compared to construction and decommissioning activities.

6.4.19.101 Any potential effects on prey species during operation and maintenance would be of the same nature as those assessed for the construction phase (including temporary habitat disturbance, localised increases in SSC and accidental pollution), but would occur at a reduced intensity, extent and frequency.

6.4.19.102 As detailed within the construction phase assessment for Blackwater Bank SAC (Section 6.4.1), predicted impacts on prey species are highly localised, short-term and fully recoverable, affecting only a very small proportion of available foraging habitat. Applying this precautionary assessment to the operational and maintenance phase, any prey-related effects would be even more limited in scale and duration.

6.4.19.103 Bottlenose dolphins are generalist predators with a broad flexible diet and are therefore resilient to short-term or localised fluctuations in prey availability. The limited and intermittent nature of operation and maintenance activities means that no meaningful reduction in prey availability or accessibility would occur at a scale relevant to the bottlenose dolphin population associated with the Lleyn Peninsula and the Sarnau SAC.

6.4.19.104 The Lleyn Peninsula and the Sarnau SAC is located approximately 71.35 km from the Proposed Development. Given this separation distance, together with the limited spatial extent of any prey-related effects during operation and maintenance activities, there is no plausible mechanism by which prey resources supporting the bottlenose dolphin population within or functionally linked to the SAC would be affected.

6.4.19.105 In the context of the Lleyn Peninsula and the Sarnau SAC site-specific COs (Table 5.1), operation and maintenance activities will not adversely affect prey availability, habitat quality, or the ability of bottlenose dolphins to forage effectively so as to maintain the population in favourable condition**. It is therefore concluded that there will be no AEoI of the bottlenose dolphin QI of the Lleyn Peninsula and the Sarnau SAC / Pen Llyn a'r Sarnau SAC, as defined by its COs, as a result of changes in prey resources associated with the operational and maintenance phase for Project Design Options 1 and 2.**

ACCIDENTAL POLLUTION

6.4.19.106 ~~6.4.18.80~~ There is the potential for an accidental release of pollutants to occur from vessels and equipment associated with the construction, operational and maintenance and decommissioning phases of the Proposed Development, which may result in adverse effects on marine mammals. Pollutants may include diesel fuel, bentonite (from drilling activities), lubricants, grease and oils, anti-fouling biocides, and grout.

~~6.4.18.81 In the event of an accidental spill, given the density and distribution of marine mammals in the Marine Mammal Study Area, it is possible that individuals could come into contact with contaminants.~~

~~6.4.18.82 Direct impacts include ingestion, inhalation, and absorption. All of which may result in physiological responses with health and long-term survival and/or reproduction consequences, the most serious of which could be damage to the respiratory system (Helm *et al.*, 2015).~~

~~6.4.18.83 Indirect impacts include short- and long-term reductions in food availability, disruption to social bonds, reduced reproduction, and/or cumulative effects on individuals, populations, and the ecosystem (Helm *et al.*, 2015).~~

6.4.19.107 ~~6.4.18.84~~ Bottlenose ~~dolphin are at risk from~~dolphins may be vulnerable to oil pollution ~~in the~~as they are obligate air-breathers and cannot leave the marine environment ~~because they lack the ability to leave the water~~ to avoid ~~oil. They are~~surface contamination. However, bottlenose dolphins are highly mobile and wide ranging, ~~therefore~~and any contact with ~~a spill~~an oil slick

would be expected to be brief. ~~They are also capable of detecting surface slicks, for example, experiments with~~Experimental studies have demonstrated that captive bottlenose dolphins ~~have shown that they can~~are capable of visually ~~discriminate~~discriminating between ~~oil~~oiled and uncontaminated water and ~~avoid~~actively avoiding oil ~~on~~at the surface ~~of the water~~ (Geraci and St. Aubin, 1984). Dolphins ~~appear~~are also thought to rely on tactile clues to detect ~~and avoid~~ oil ~~and it is unlikely that they would be unknowingly subjected to~~, reducing the likelihood of prolonged or repeated exposure ~~to oil~~ in the wild (Helm *et al.*, 2015).

6.4.19.108 ~~6.4.18.85 However~~Notwithstanding this avoidance capability, bottlenose dolphin must surface periodically to breathe~~, potentially bringing them~~ and may therefore come into contact with floating oil ~~and~~or volatile toxic components~~. The more~~, particularly where slicks are extensive ~~the slick, the more likely that an animal will surface within it~~ (Geraci and St. Aubin, 1980). ~~While~~Although oil does not readily penetrate cetacean skin, exposure ~~could~~may affect ~~mucus~~mucous membranes, eyes, and other sensitive external soft tissue areas, ~~potentially resulting in~~and in severe cases, could result in injury or mortality (Helm *et al.*, 2015).

~~6.4.18.86 Overall, accidental pollution has the potential to cause LSE on bottlenose dolphin features.~~

CONSTRUCTION AND DECOMMISSIONING PHASE ASSESSMENT

6.4.19.109 ~~6.4.18.87~~ The installation and removal of ~~the~~ offshore infrastructure for the Proposed Development may ~~lead to~~result in the accidental release of pollutants through spills and leaks from vessels and equipment~~. The project design parameters for Project Design Option 1 during the construction phase are outlined in~~ Table 6.8 ~~and include the installation of 56 WTGs, two OSPs, between 110 and 122 km of inter-array cables, between 25 and 28 km of interconnector cables, and between 35 and 40 km offshore export cables. There will also be up to 4,150 vessel round trips and 294 helicopter round trips during the construction phase (including activities at the landfall site~~ (Table 6.8).

~~6.4.18.88 The~~ Potential ~~impact to marine mammals from accidental pollution~~impacts during the decommissioning phase ~~is~~are expected to be ~~the same~~similar to, or less than, those during the construction phase.

6.4.19.110 ~~6.4.18.89~~ The magnitude of ~~the impact of~~any accidental pollution ~~will be dependent on the quantities of potential pollutants carried by construction vessels and within equipment.~~event would depend on the type and quantity of material released, with the release of ~~a large inventory of~~ fuel ~~oil~~ from a construction vessel ~~is, however,~~ considered to represent the ~~greatest~~largest potential ~~accidental pollution event~~spill scenario from installation activities. In the event of an accidental spill from vessels, equipment or from construction activities, ~~the spill~~pollutants would be subject to immediate dilution and rapid ~~dispersal~~dispersion within the marine environment (Marappan *et al.,* 2022).

~~6.4.18.90 Considering avoidance through design and management (see~~ Table 6.7~~), the likelihood of accidental release is considered extremely low. The measures in the EMP include storage of chemicals in secure designated areas on vessels in line with appropriate regulations and guidelines, and double skinning of any tanks and pipes containing hazardous substances. All chemicals used will be subject to a chemical risk assessment to ensure risks are understood and minimised. The EMP also includes a MPCP which will contain key emergency contact details and response procedures in the event of a spill of any magnitude to ensure minimal impact. Complying with these procedures will also reduce the magnitude of any spill. Adherence to the avoidance design and management measures outlined in~~ Table 6.7~~, including the EMP and MPCP will significantly reduce the likelihood of an accidental pollution incident occurring, and the magnitude of its impact.~~

6.4.19.111 The likelihood of accidental pollution is considered extremely low due to avoidance through design and management measures (Table 6.7). These include the secure storage and handling

of chemicals and hazardous material, double-skinned tanks and pipework where appropriate, chemical risk assessments, and the implementation of an EMP and MPCP. The MPCP sets out emergency response procedures to minimise the scale and duration of any spill should one occur.

6.4.19.112 The Lleyn Peninsula and the Sarnau SAC is located approximately 71.35 km from the Proposed Development. Given this separation distance, the very low likelihood of an accidental pollution event, the highly localised nature of any potential spill, rapid dispersion processes, and the mitigation measures in place, there is no plausible mechanism by which accidental pollution could affect bottlenose dolphin habitat use or population condition within, or functionally linked to, the SAC.

6.4.19.113 ~~6.4.18.91~~ Given the inherent low likelihood of an accidental pollution event from vessel activity and other activities, ~~**as well as the proposed avoidance/ impacts reduction**~~the highly localised nature of any potential exposure, and the mitigation measures (as set out in Table 6.7), ~~**there is no potential for AEoI from**~~ accidental pollution ~~**on**~~associated with construction and decommissioning activities will not adversely affect the ability of bottlenose dolphins to maintain the population in favourable condition or to make appropriate use of the site**. It is therefore concluded that there will be no AEoI of the bottlenose dolphin QI of the Lleyn Peninsula and the Sarnau SAC / Pen Llyn a'r Sarnau SAC, as defined by the COs ~~of the site, impacting bottlenose dolphin from~~, as a result of accidental pollution associated with the construction and decommissioning phase for Project Design Option 1.**

6.4.19.114 ~~6.4.18.92~~ **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

OPERATIONAL AND MAINTENANCE PHASE ASSESSMENT

~~6.4.18.93 There is the potential for the accidental release of pollutants during this phase of the Proposed Development as a result of the presence of offshore infrastructure, associated equipment, and vessel movements. The project design parameters for Project Design Option 1 during the operational and maintenance phase are outlined in~~ Table 6.8~~. This includes synthetic compound, for example from antifouling biocides, heavy metal, and hydrocarbon contamination as a result of the presence of 56 WTGs and two OSPs as well as from maintenance activities. There will also be up to 1,294 vessel round trips and 485 helicopter round trips per year during this phase of the proposed development.~~

6.4.19.115 During the operational and maintenance phase, there remains a potential for accidental release of pollutants as a result of the presence of offshore infrastructure, routine inspection and maintenance activities, and vessel movements within the Proposed Development (Table 6.8).

6.4.19.116 The potential pathways, likelihood and consequences of accidental pollution during this phase are consistent with those assessed for the construction phase, but would generally be of lower magnitude due to reduced vessel numbers, activity intensity and the intermittent nature of maintenance works. The same avoidance through design and management measures, including the EMP and MPCP (Table 6.7), will be implemented throughout operation and maintenance of the Proposed Development.

6.4.19.117 The Lleyn Peninsula and the Sarnau SAC is located approximately 71.35 km from the Proposed Development. Given this separation distance, the very low likelihood of an accidental pollution event, the highly localised and rapidly dispersive nature of any potential spill, and the mitigation and emergency response measures in place, there is no plausible mechanism by which accidental pollution during the operational and maintenance phase could affect bottlenose dolphin habitat use, health or population viability within, or functionally linked to, the SAC.

6.4.19.118 ~~6.4.18.94 The assessment for this phase is the same as for the construction phase, with the same avoidance by design and management measures being implemented to reduce the risk to negligible levels (see~~ Table 6.7~~ and Section 0)~~In the context of the Lleyn Peninsula and the

Sarnau SAC site-specific COs (Table 5.1), accidental pollution associated with the operational and maintenance phase will not adversely affect the ability of bottlenose dolphins to maintain the population in favourable condition or to make appropriate use of the site. **It is therefore concluded that ~~the potential for AEoI upon the integrity of~~there will be no AEoI of the bottlenose dolphin QI of the Lleyn Peninsula and the Sarnau SAC / Pen Llyn a'r Sarnau SAC, as defined by ~~the~~its COs ~~of the site, from~~, as a result of accidental pollution ~~impacting bottlenose dolphin from~~associated with the operational and maintenance phase for Project Design Option 1 ~~is entirely negligible~~.**

6.4.19.119 ~~6.4.18.95~~ **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

Grey seal

6.4.19.120 The relevant Annex II marine mammal QI site-specific COs at Lleyn Peninsula and the Sarnau SAC is to maintain FCS of the grey seal feature, as defined by the list of attributes and targets set out in Table 5.1 (NRW, 2025a).

6.4.19.121 Seven potential impact pathways relevant to grey seal have been identified in relation to the construction, operation and maintenance, and decommissioning of the Proposed Development, (Table 6.8). These pathways have been assessed in detail for Lambay Island SAC, which is designated for the same Annex II marine mammal QI, and is located approximately 61.89 km from the Proposed Development, compared to approximately 71.35 km from Lleyn Peninsula and the Sarnau SAC.

6.4.19.122 As the severity and likelihood of all relevant impact pathways are intrinsically distance-dependent, Lambay Island SAC represents the closest designated site for grey seal from the Proposed Development. The assessment presented in Section 6.4.5 therefore provides a conservative basis for evaluation and concluded that none of the identified impact pathways would result in an AEoI of Lambay Island SAC, with respect to the grey seal QI.

6.4.19.123 Given that the Lleyn Peninsula and the Sarnau SAC supports the same Annex II marine mammal QI and lies further from the Proposed Development, the magnitude of effects at Lleyn Peninsula and the Sarnau SAC is concluded to be no greater than, and in practice less than, those assessed for Lambay Island SAC. **It is therefore concluded that there will be no AEoI of the grey seal QI of the Lleyn Peninsula and the Sarnau SAC / Pen Llyn a'r Sarnau SAC, as defined by its COs, as a result of any of the impacts considered for Project Design Option 1 across any phase.**

~~6.4.18.96 The conservation objectives for grey seal at this designated site is to achieve favourable conservation status (FCS) of the feature, how this is defined is presented in Table 5.1.~~

~~6.4.18.97 There are four key potential impacts on grey seal associated with the construction, operational and maintenance, and decommissioning of the Proposed Development, which are presented in Table 6.8 and are assessed below for each phase of the Proposed Development. These comprise of Injury and/ or disturbance from underwater noise caused by piling and construction activities, Injury and/ or disturbance caused by vessel movements, Changes in prey and Accidental pollution.~~

~~6.4.18.98 With consideration that the impact severity is based on distance from the site of works, Lambay Island SAC (62.87 km) is designated for the same QIs as Lleyn Peninsula and the Sarnau/ Pen Llyn a'r Sarnau SAC (73.32 km) and is located nearer to the Proposed Development, it was concluded that the potential for AEoI is the same or reduced for this site. In Section 6.4.6, it has been concluded that none of the potential effects on grey seal would result in an AEoI of the QIs.~~

~~6.4.18.99 **Therefore, there is no AEoI for Lleyn Peninsula and the Sarnau/ Pen Llyn a'r Sarnau SAC as defined by the COs of the site as a result of any of the impacts considered above affecting grey seal from Project Design Option 1.**~~

6.4.19.124 ~~6.4.18.100~~ **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

6.4.20 ~~6.4.19~~ Cardigan Bay / Bae Ceredigion SAC

Bottlenose dolphin

6.4.20.1 The relevant Annex II marine mammal QI site-specific COs at Cardigan Bay SAC is to maintain FCS of the bottlenose dolphin QI, as defined by the list of attributes and targets set out in Table 5.1 (NRW, 2025b).

6.4.20.2 Eight potential impact pathways relevant to bottlenose dolphin have been identified in relation to the construction, operation, and maintenance, and decommissioning of the Proposed Development (Table 6.8). These pathways have been assessed in detail for Lleyn Peninsula and the Sarnau SAC, which is also designated for the same Annex II marine mammal QI and is located approximately 71.35 km from the Proposed Development, compared to approximately 82.05 km from Cardigan Bay SAC.

6.4.20.3 As the severity and likelihood of all relevant impact pathways are intrinsically distance-dependent, Lleyn Peninsula and the Sarnau SAC represents the closest designated site for bottlenose dolphin from the Proposed Development. The assessment presented in Section 6.4.18 therefore provides a conservative basis for evaluation and concluded that none of the identified impact pathways would result in an AEoI of Lleyn Peninsula and the Sarnau SAC with respect to the bottlenose dolphin QI.

~~6.4.19.1 The conservation objectives for bottlenose dolphin at this designated site is to achieve FCS of the feature, how this is defined is presented in Table 5.1.~~

~~6.4.19.2 There are five key potential impacts on bottlenose dolphin associated with the construction, operational, and maintenance, and decommissioning of the Proposed Development, which are presented in Table 6.8 and are assessed below for each phase of the Proposed Development. These comprise of Injury and/ or disturbance from underwater noise caused by piling and construction activities, Injury and/ or disturbance caused by vessel movements, Changes in prey, Changes in EMF and Accidental pollution.~~

~~6.4.19.3 With consideration that the impact severity is based on distance from the site of works, Lleyn Peninsula and the Sarnau/ Pen Llyn a'r Sarnau SAC (73.32 km) is designated for the same QIs as Cardigan Bay/ Bae Ceredigion SAC (82.73 km) and is located nearer to the Proposed Development, it was concluded that the potential for AEoI is the same or reduced for this site. In Section 6.4.19 it has been concluded that none of the potential effects on bottlenose dolphin would result in an AEoI of the QIs.~~

6.4.20.4 ~~6.4.19.4~~ ~~**Therefore,**~~Given that Cardigan Bay SAC supports the same Annex II marine mammal QI and lies further from the Proposed Development, the magnitude of effects at Cardigan Bay SAC is concluded to be no greater than, and in practice less than, those associated for Lleyn Peninsula and the Sarnau SAC. **It is therefore concluded that there ~~is~~will be no AEoI ~~for~~of the bottlenose dolphin QI of the Cardigan Bay / Bae Ceredigion SAC, as defined by ~~the~~its COs ~~of the site~~, as a result of any of the impacts considered ~~above affecting bottlenose dolphin from~~for Project Design Option 1 ~~in this~~across any phase.**

6.4.20.5 ~~6.4.19.5~~ **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

Grey seal

6.4.20.6 The relevant Annex II marine mammal QI site-specific COs at Cardigan Bay SAC is to maintain FCS of the grey seal QI, as defined by the list of attributes and targets set out in Table 5.1 (NRW, 2025b).

6.4.20.7 Seven potential impact pathways relevant to grey seal have been identified in relation to the construction, operation and maintenance, and decommissioning of the Proposed Development, (Table 6.8). These pathways have been assessed in detail for Lambay Island SAC, which is designated for the same Annex II marine mammal QI, and is located approximately 61.89 km from the Proposed Development, compared to approximately 82.05 km from Cardigan Bay SAC.

6.4.20.8 As the severity and likelihood of all relevant impact pathways are intrinsically distance-dependent, Lambay Island SAC represents the closest designated site for grey seal from the Proposed Development. The assessment presented in Section 6.4.5 therefore provides a conservative basis for evaluation and concluded that none of the identified impact pathways would result in an AEoI of Lambay Island SAC, with respect to the grey seal QI.

~~6.4.19.6 The conservation objectives for grey seal at this designated site is to achieve FCS of the feature, how this is defined is presented in Table 5.1.~~

~~6.4.19.7 There are four key potential impacts on grey seal associated with the construction, operational and maintenance, and decommissioning of the Proposed Development, which are presented in~~ Table 6.8 ~~and are assessed below for each phase of the Proposed Development. These comprise of Injury and/ or disturbance from underwater noise caused by piling and construction activities, Injury and/ or disturbance caused by vessel movements, Changes in prey and Accidental pollution.~~

~~6.4.19.8 With consideration that the impact severity is based on distance from the site of works, Lambay Island SAC (62.87 km) is designated for the same QIs as Cardigan Bay/ Bae Ceredigion SAC (82.73 km) and is located nearer to the Proposed Development, it was concluded that the potential for AEoI is the same or reduced for this site. In Section 6.4.6 it has been concluded that none of the potential effects on grey seal would result in an AEoI of the QIs.~~

6.4.20.9 ~~6.4.19.9~~ **~~Therefore,~~**Given that Cardigan Bay SAC supports the same Annex II marine mammal QI and lies further from the Proposed Development, the magnitude of effects at Cardigan Bay SAC is concluded to be no greater than, and in practice less than, those associated for Lambay Island SAC. **It is therefore concluded that** there **~~is~~will be** no AEoI **~~for~~of the grey seal QI of the** Cardigan Bay / **~~Bea~~Bae** Ceredigion SAC, as defined by **~~the~~its** COs **~~of the site~~**, as a result of any of the impacts considered **~~above affecting grey seal from~~for** Project Design Option 1 **~~in this~~across any** phase.

6.4.20.10 ~~6.4.19.10~~ **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

6.4.21 ~~6.4.20 North Anglesey~~Pembrokeshire Marine / ~~Gogledd Môn~~Sir Benfro Forol SAC

~~Harbour porpoise~~Grey seal

6.4.21.1 The relevant Annex II marine mammal QI site-specific COs at Pembrokeshire Marine SAC is to maintain FCS of the grey seal QI, as defined by the list of attributes and targets set out in Table 5.1 (NRW, 2025c).

6.4.21.2 Seven potential impact pathways relevant to grey seal have been identified in relation to the construction, operation and maintenance, and decommissioning of the Proposed Development, (Table 6.8). These pathways have been assessed in detail for Lambay Island SAC, which is designated for the same Annex II marine mammal QI, and is located approximately 61.89 km from the Proposed Development, compared to approximately 86.45 km from Pembrokeshire Marine SAC.

6.4.21.3 As the severity and likelihood of all relevant impact pathways are intrinsically distance-dependent, Lambay Island SAC represents the closest designated site for grey seal from the Proposed Development. The assessment presented in Section 6.4.5 therefore provides a conservative

basis for evaluation and concluded that none of the identified impact pathways would result in an AEoI of Lambay Island SAC, with respect to the grey seal QI.

6.4.21.4 Given that Pembrokeshire Marine SAC supports the same Annex II marine mammal QI and lies further from the Proposed Development, the magnitude of effects at Pembrokeshire Marine SAC is concluded to be no greater than, and in practice less than, those associated for Lambay Island SAC. **It is therefore concluded that there will be no AEoI of the grey seal QI of the Pembrokeshire Marine / Sir Benfro Forol SAC, as defined by its COs, as a result of any of the impacts considered for Project Design Option 1 across any phase.**

~~6.4.20.1 The conservation objectives for harbour porpoise at this designated site is to ensure that the integrity of the site is maintained and that it makes the best possible contribution to maintaining FCS for harbour porpoise in UK waters, how this is defined is presented in Table 5.1.~~

~~6.4.20.2 There are five key potential impacts on harbour porpoise associated with the construction, operational, and maintenance, and decommissioning of the Proposed Development, which are presented in Table 6.8 and are assessed below for each phase of the Proposed Development. These comprise of Injury and/ or disturbance from underwater noise caused by piling and construction activities, Injury and/ or disturbance caused by vessel movements, Changes in prey, and Changes in EMF and Accidental pollution.~~

~~6.4.20.3 With consideration that the impact severity is based on distance from the site of works Blackwater Bank SAC (19.76 km) is designated for the same QIs as North Anglesey Marine/ Gogledd Môn Forol SAC (114.17 km) and is located nearer to the Proposed Development, it was concluded that the potential for AEoI is the same or reduced for this site. In Section 0, it has been concluded that none of the potential effects on harbour porpoise would result in an AEoI of the QIs.~~

~~6.4.20.4 **Therefore, there is no AEoI for North Anglesey Marine/ Gogledd Môn Forol SAC, as defined by the COs of the site, as a result of any of the impacts considered above affecting harbour porpoise from Project Design Option 1 in this phase.**~~

6.4.21.5 ~~6.4.20.5~~ **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

6.4.22 ~~6.4.21~~ North Channel SAC

Harbour porpoise

6.4.22.1 ~~6.4.21.1 The conservation objectives for harbour porpoise at this designated site~~The relevant Annex II marine mammal QI site-specific COs at North Channel SAC is to ensure that the integrity of the site is maintained and that it makes the best possible contribution to maintaining FCS for harbour porpoise in UK waters, ~~how this is~~as defined ~~is presented~~by the list of attributes and targets set out in Table 5.1 (JNCC, 2019a).

6.4.22.2 Eight potential impact pathways relevant to harbour porpoise have been identified in relation to the construction, operation and maintenance, and decommissioning of the Proposed Development (Table 6.8). These pathways have been assessed in detail for Blackwater Bank SAC which is also designated for the same Annex II marine mammal QI and is located approximately 19.13 km from the Proposed Development, compared to approximately 142.32 km from North Channel SAC.

6.4.22.3 As the severity and likelihood of all relevant impact pathways are intrinsically distance-dependent, Blackwater Bank SAC represents the closest designated site for harbour porpoise from the Proposed Development. The assessment presented in Section 6.4.1 therefore provides a conservative basis for evaluation and concluded that none of the identified impact pathways would result in an AEoI of Blackwater Bank SAC, with respect to the harbour porpoise QI.

6.4.21.2 There are five key potential impacts on harbour porpoise associated with the construction, operational, and maintenance, and decommissioning of the Proposed Development, which are presented in Table 6.8 and are assessed below for each phase of the Proposed Development. These comprise of Injury and/ or disturbance from underwater noise caused by piling and construction activities, Injury and/ or disturbance caused by vessel movements, Changes in prey, Changes in EMF and Accidental pollution.

6.4.21.3 With consideration that the impact severity is based on distance from the site of works Blackwater Bank SAC (19.76 km) is designated for the same QIs as North Channel SAC (194.53 km) and is located nearer to the Proposed Development, it was concluded that the potential for AEoI is the same or reduced for this site. In Section 0, it has been concluded that none of the potential effects on harbour porpoise would result in an AEoI of the QIs.

6.4.22.4 6.4.21.4 **Therefore,** Given that North Channel SAC supports the same Annex II marine mammal QI and lies substantially further away from the Proposed Development, the magnitude of effects at North Channel SAC is concluded to be no greater than, and in practice less than, those assessed for Blackwater Bank SAC. **It is therefore concluded that** there **is will be no AEoI for of the harbour porpoise QI of the North Channel SAC, as defined by the its COs of the site, as a result of any of the impacts considered above affecting harbour porpoise from for Project Design Option 1 in this across any phase.**

6.4.22.5 6.4.21.5 **Based on the increased representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

6.4.23 6.4.22 Bristol Channel Approaches / Dynesfeydd Môr Hafren SAC

Harbour porpoise

6.4.23.1 6.4.22.1 The conservation objectives for harbour porpoise at this designated site The relevant Annex II marine mammal QI site-specific COs at Bristol Channel Approaches SAC is to ensure that the integrity of the site is maintained and that it makes the best possible contribution to maintaining FCS for harbour porpoise in UK waters, how this is as defined is presented by the list of attributes and targets set out in Table 5.1 (JNCC, 2019b).

6.4.22.2 There are five key potential impacts on harbour porpoise associated with the construction, operational, and maintenance, and decommissioning of the Proposed Development, which are presented in Table 6.8 and are assessed below for each phase of the Proposed Development. These comprise of Injury and/ or disturbance from underwater noise caused by piling and construction activities, Injury and/ or disturbance caused by vessel movements, Changes in prey, Changes in EMF and Accidental pollution.

6.4.23.2 Eight potential impact pathways relevant to harbour porpoise have been identified in relation to the construction, operation and maintenance, and decommissioning of the Proposed Development (Table 6.8). These pathways have been assessed in detail for Blackwater Bank SAC which is also designated for the same Annex II marine mammal QI and is located approximately 19.13 km from the Proposed Development, compared to approximately 214.68 km from Bristol Channel Approaches SAC.

6.4.23.3 As the severity and likelihood of all relevant impact pathways are intrinsically distance-dependent, Blackwater Bank SAC represents the closest designated site for harbour porpoise from the Proposed Development. The assessment presented in Section 6.4.1 therefore provides a conservative basis for evaluation and concluded that none of the identified impact pathways would result in an AEoI of Blackwater Bank SAC, with respect to the harbour porpoise QI.

6.4.23.4 6.4.22.3 With consideration that the impact severity is based on distance from the site of works, Blackwater Bank SAC (19.76 km) is designated for the same QIs as Given that Bristol Channel Approaches/ Dynesfeydd Môr Hafren SAC (214.68 km) and is located nearer to SAC supports

the same Annex II marine mammal QI and lies substantially further away from the Proposed Development, ~~it was concluded that the potential for AEoI is the same or reduced for this site. In Section 0, it has been concluded that none of the potential effects on harbour porpoise would result in an AEoI of the QIs.~~

~~6.4.22.4~~ the magnitude of effects at the Bristol Channel Approaches SAC is concluded to be no greater than, and in practice less than, those assessed for Blackwater Bank SAC. **It is therefore concluded that there will be no AEoI of the harbour porpoise QI of the ~~Therefore, there is no AEoI for~~ Bristol Channel Approaches / Dynesfeydd Môr Hafren SAC, as defined by ~~the~~its COs ~~of the site~~, as a result of any of the impacts considered ~~above affecting harbour porpoise from~~for Project Design Option 1 ~~in this~~across any phase.**

6.4.23.5 ~~6.4.22.5~~ **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

6.4.24 ~~6.4.23~~ Transboundary sites within Mainland Europe

Harbour porpoise

6.4.24.1 ~~6.4.23.1~~ These comprise of the following French Natura 2000 sites:

- Abers - Côtes des legends;
- Nord Bretagne DH ~~(FR)~~;

~~• Récifs et Lands de la Hague (FR) SAC;~~
~~• Anse de Vauville (FR) SAC;~~
~~• Mers Celtiques - Talus du golfe de Gascogne (FR) SAC;~~
~~• Tregor Goëlo (FR) SAC;~~
~~• Banc et récifs de Surtainville (FR) SAC;~~

- Baie de Morlaix ~~(FR) SAC~~;
- Ouessant-Molène ~~(FR) SAC~~;

~~• Cap d'Erquy-Cap Fréhel (FR) SAC;~~
~~• Chausey (FR) SAC;~~

- Côte de Granit rose-Sept-Iles ~~(FR) SAC~~;

~~• Abers - Côtes des legends (FR) SAC;~~

- Côtes de Crozon ~~(FR) SAC~~;
- Chaussée de Sein;
- Tregor Goëlo;
- Mers Celtiques - Talus du golfe de Gascogne;
- Récifs et Lands de la Hague;
- Baie de Saint-Brieuc – Est ~~(FR) SAC~~;
- ~~Chaussée~~Anse de ~~Sein (FR) SAC~~Vauville;
- Cap d'Erquy-Cap Fréhel;
- Banc et récifs de Surtainville;
- Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard ~~(FR) SAC~~;
- ~~Baie du Mont Saint-Michel (FR) SAC; and~~Chausey;
- Estuaire de le Rance ~~(FR) SAC.~~; and

~~6.4.23.2 There are no conservation objectives available for harbour porpoise at these designated sites as outlined in Table 5.1, however it is assumed that the objectives will be to ensure that the integrity of the site is maintained and ensure that the site contributes to achieving the FCS of its QIs.~~

6.4.23.3 There are five key potential impacts on harbour porpoise associated with the construction, operational, and maintenance, and decommissioning of the Proposed Development, which are presented in Table 6.8 and are assessed below for each phase of the Proposed Development. These comprise of Injury and/ or disturbance from underwater noise caused by piling and construction activities, Injury and/ or disturbance caused by vessel movements, Changes in prey, Changes in EMF and Accidental pollution.

- Baie du Mont Saint-Michel.

6.4.24.2 There are no published site-specific COs available for the Annex II harbour porpoise QI at these above transboundary designated sites. In the absence of formal site-specific COs and associated attributes and targets, a precautionary approach is applied. The assessment on the integrity of these sites in respect of the harbour porpoise QI adopts the overarching objectives used for Irish and UK SACs designated for the same QI, which aim to maintain favourable conservation condition by ensuring continued access to the site as a suitable habitat, without significant disturbance (as per the COs for all Irish SACs with a harbour porpoise QI; see full detail in Section 6.4.1.1), and where the conditions supporting site use, including prey availability and supporting processes, are maintained (as included in the COs for all English and Welsh SACs with a harbour porpoise QI; Table 5.1).

6.4.24.3 This approach is informed by all the available ecological information for the transboundary sites, including the Natura 2000 Standard Data Forms for each site (EEA, 2025a-r), which provide context on habitat characteristics and species presence, supporting the precautionary assessment. Where available, national guidance and management documents for French designated sites, such as Arrêtés Ministériels and Documents d'Objectifs[6], outline the formally adopted management objectives and conservation measures for species and habitats within the sites. Although not published in the same CO format as in Ireland and the UK, they state that French site management aims to maintain suitable habitat and minimise disturbance to marine mammals, broadly consistent with that applied for Irish and UK sites with the same QI, for example West Wales Marine SAC (NRW, 2019a; Section 6.4.17) and Rockabill to Dalkey Island SAC (NPWS, 2013b; Section 6.4.2). This information supports identification of relevant pressures, including disturbance from underwater noise, habitat degradation or loss, and barriers to movement or foraging access. Therefore, all the available information used provides a robust framework for the assessment of potential impacts on the harbour porpoise QI in these transboundary sites.

6.4.24.4 Eight potential impact pathways relevant to harbour porpoise have been identified in relation to the construction, operation and maintenance, and decommissioning of the Proposed Development (Table 6.8). These pathways have been assessed in detail for Blackwater Bank SAC which is also designated for the same Annex II marine mammal QI and is located approximately 19.13 km from the Proposed Development, compared to the closest being 486.66 km from Abers - Côtes des legends.

6.4.24.5 6.4.23.4 With consideration that the impact severity is based on distance from the site of worksAs the severity and likelihood of all relevant impact pathways are intrinsically distance-dependent, Blackwater Bank SAC (19.76 km) is designated for the same QIs as Transboundary sites within Mainland Europe (represents the closest being 486.66 km) and is located nearer todesignated site for harbour porpoise from the Proposed Development, it was concluded that the potential for AEoI is the same or reduced for these sites.. The assessment presented in Section 0 it has been6.4.1 therefore provides a conservative basis for evaluation and concluded that none of the

[6] Office Français de la Biodiversité (2025). Natura 2000 France – Site documentation and management objectives. Available at: https://www.natura2000.fr

~~potential effects on harbour porpoise~~identified impact pathways would result in an AEoI of ~~the QIs~~Blackwater Bank SAC, with respect to the harbour porpoise QI.

6.4.24.6 ~~6.4.23.5 **Therefore, there is no AEoI for Transboundary sites within Mainland Europe, as defined by the COs of the site,**~~Given that these transboundary European sites supports the same Annex II marine mammal QI and lies substantially further away from the Proposed Development, the magnitude of effects at these transboundary sites is concluded to be no greater than, and in practice less than, those assessed for Blackwater Bank SAC. There is therefore no pathway by which the Proposed Development could restrict access to suitable habitat within these sites or result in disturbance at levels capable of adversely affecting harbour porpoise using these sites. **It is therefore concluded that there will be no AEoI of the harbour porpoise QI of these transboundary sites, as a result of any of the impacts considered ~~above affecting harbour porpoise from~~for Project Design Option 1 ~~in this~~across any phase.**

6.4.24.7 ~~6.4.23.6~~ **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

6.4.25 ~~6.4.24~~ Summary of Stage 2 Appraisal for Sites Screened in for Annex II Marine Mammal Species QIs

6.4.25.1 ~~6.4.24.1 Five~~Seven potential impacts for seals and eight potential impacts for cetaceans were assessed for impacts on Annex II marine mammals resulting from construction, operational and maintenance ~~and~~and decommissioning of the Proposed Development, the results of this assessment can be seen in ~~**Error! Unknown switch argument.**~~Table 6.~~20~~34Table 6.2034.

Table 6.~~20~~34: Conclusion for the assessment of potential impacts on European designated sites screened in for Annex II Marine Mammal Species QIs

Potential impact	Differences between Project Design Option 1 and 2	Conclusion
Injury and/ or disturbance by underwater noise from piling and all other construction activities	Project Design Option 1 comprises of ~~9~~6 more WTGs than Project Design Option 2, installation of these is the primary source of underwater noise produced by the Proposed Development. Other activities producing underwater noise will be the same for both Project Design Option 1 and 2, with no difference.	As both Project Design Options produce underwater noise from construction activities they have both been considered. ~~With consideration of~~ Based on the ~~overall temporary nature of the works and low sensitivity to the impact~~above assessment, it is concluded no AEoI for either Project Design Option from underwater noise.
Injury and/or disturbance from UXO clearance	There is no difference between Project Design Option 1 and 2. The methods of UXO clearance, as well as number and size that require clearance, are unknown.	As both Project Design Option 1 and Project Design Option 2 comprise of the same information on UXO clearance, and based on the conclusions above, it is concluded no AEoI from UXO clearance.
Injury and/or disturbance from ~~Vessel~~	There is no difference between Project Design Option 1 and 2, as the same number ~~of vehicles~~ and ~~movements~~type of site surveys is anticipated to be carried out.	As both Project Design Option 1 and Project Design Option 2 comprise of the same ~~vessel movements~~site surveys, and

Potential impact	Differences between Project Design Option 1 and 2	Conclusion
~~movements~~site surveys		based on the conclusions above, it is concluded no AEoI from ~~vessel movements~~site surveys.
~~Accidental Pollution~~Injury and/or disturbance from dredging and trenching	~~Within the construction phase Project Design Option 1 consists of a larger number of foundations to be installed – 58 monopile foundations in total (56 for WTGs and 2 for OSPs), whilst Project Design Option 2 comprises of 49 foundations in total (47 for WTGs and 2 for OSPs).. Therefore, Project Design Option 1 will have a greater potential for accidental pollution.~~ ~~Within the Decommissioning Phase Project Design Option 1 will result in the deconstruction and removal of all 56 WTG topsides and 2 OSP topsides , with both to be cut at seabed level, whilst Project Design Option 2 consists of the deconstruction and removal of all 47 WTG topsides and 2 OSP topsides , with both to be cut at seabed level . Therefore, Project Design Option 1 will have a greater potential for accidental pollution.~~ ~~Therefore, overall~~There is no difference between Project Design Option 1 ~~has a higher potential for impact than Project Design Option 2~~and 2, as the same amount of dredging and trenching is anticipated to be carried out.	As both ~~options have a risk of accidental pollution they have both been considered. With consideration of the avoidance by design and management features we have concluded no AEoI for either~~ Project Design Option ~~from accidental pollution~~1 and Project Design Option 2 comprise of the same dredging and trenching activities, and based on the conclusions above, it is concluded no AEoI from dredging and trenching.
Injury and/or disturbance from vessel movements	There is no difference between Project Design Option 1 and 2, as the same number of vehicles and movements is anticipated to be carried out.	As both Project Design Option 1 and Project Design Option 2 comprise of the same vessel movements, and based on the conclusions above, it is concluded no AEoI from vessel movements.
Changes in EMF from subsea electrical cabling (cetaceans only)	There is no difference between Project Design Option 1 and 2, as the same amount of cabling is anticipated to be installed.	As both Project Design Option 1 and Project Design Option 2 comprise of the same cabling, based on the above assessment it is concluded no AEoI from EMF.
Changes in fish and shellfish community affecting prey resources	Project Design Option 1 comprises of ~~9~~6 more WTGs that Project Design Option 2, installation of these is the primary source of underwater noise, ~~suspended sediment~~increased SSC and associated deposition ~~(SSD)~~, and other potential impacts produced by the Proposed Development. Overall, Project Design Option 1 has the higher potential impact.	As both Project Design Option 1 and Project Design Option 2 both have ~~the potential~~been considered to cause changes in prey, based on the above assessment it is concluded no potential for AEoI for either Project Design Option from changes in prey.
Accidental pollution	Project Design Option 1 comprises of 6 more WTGs than Project Design Option 2, therefore installation of these will have a marginally greater potential for accidental pollution. Within the Decommissioning Phase Project Design Option 1 will result in the deconstruction and removal	As both options have a risk of accidental pollution they have both been considered. Based on the above assessment it is concluded no AEoI for either Project Design Option from accidental pollution.

Potential impact	Differences between Project Design Option 1 and 2	Conclusion
	of all 53 WTG topsides and 2 OSP topsides, with both to be cut at seabed level, whilst Project Design Option 2 consists of the deconstruction and removal of all 47 WTG topsides and 2 OSP topsides, with both to be cut at seabed level. Therefore, Project Design Option 1 will have a marginally greater potential for accidental pollution. Therefore, overall Project Design Option 1 has a higher potential for impact than Project Design Option 2.	

6.5 Baseline information to inform Stage 2 AA for Migratory Fish Species QIs

6.5.1.1 As outlined in Section 5.1, the following designated sites in Ireland have ~~continued through~~proceeded from the Stage 1 Screening Assessment ~~to be~~, as documented in NIS Volume I: Supporting Information for Screening for Appropriate Assessment (Revised March 2026) to be considered herein and assessed in Stage 2 as a ~~likely significant effect~~LSE could not be ruled out. These are presented in Figure 6.~~7~~17Figure 6.~~7~~17.

- Slaney River Valley SAC – freshwater pearl mussels, twaite shad, Atlantic salmon, sea lamprey and river lamprey;
- River Barrow and River Nore SAC – freshwater pearl mussels, twaite shad, Atlantic salmon, sea lamprey and river lamprey;
- Lower River Suir SAC - freshwater pearl mussels, twaite shad, Atlantic salmon, sea lamprey and river lamprey; and
- River Boyne and River Blackwater SAC – Atlantic salmon.

6.5.1.2 The Array Area and Cable Corridor and Working Area do not overlap any ~~of these~~ designated sites, with the closest site being the Slaney River Valley SAC at ~~44.54~~47.55 km from the Proposed Development. All migratory fish species are highly mobile and so despite distance, the above sites have been screened in due to potential LSE on the qualifying features caused by the Proposed Development. ~~The Stage 1 SISAA (~~NIS Volume I: Supporting Information for Screening for Appropriate Assessment (Revised March 2026) concluded that there is potential for LSE via underwater noise, EMF ~~and changes in prey availability~~effects and accidental pollution for freshwater pearl mussels (indirectly via effects on host), twaite shad, Atlantic salmon, sea lamprey and river lamprey.

6.5.1.3 Underwater noise will be produced by the Proposed Development primarily through piling activities, with vessel movements also partly contributing to the LSE potential from underwater noise. Underwater noise from piling and other activities can result in individuals suffering physical injury, hearing damage and disturbance or displacement.

6.5.1.4 EMF induced effects (e.g. effects on navigation and other life-history dependant functions) may ~~occur may~~ arise during the operational and maintenance phase of the Proposed Development if individuals are located within close proximity to the cabling.

~~6.5.1.5 Changes in prey can include a change in species distribution and abundance and may be caused by accidental pollution and/ or an ensonified underwater noise environment and/ or as a result of increased collision risk with vessels and/ or prey species may be impacted by EMF induced effects.~~

~~6.5.1.6~~ Overall, the following ~~effects~~impact pathways are therefore considered below, with consideration of the ~~conservation objectives~~COs of the ~~qualifying interests~~QIs of these SACs:

- Underwater noise from piling activities;
- Underwater noise from other activities; ~~and~~
- EMF~~.~~; and
- Accidental pollution (including deterioration of water clarity).

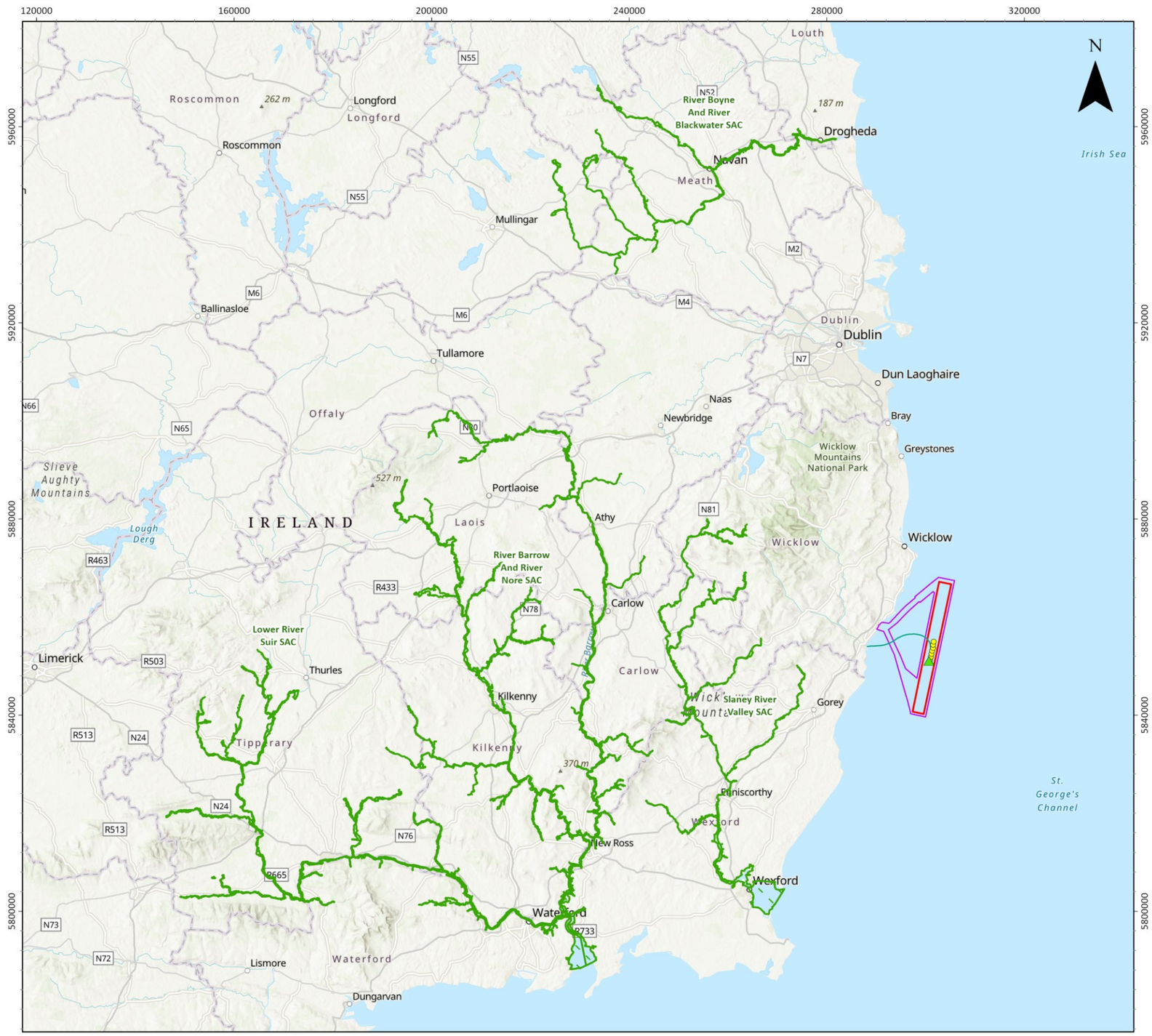

Figure Reference: Ark_007_Stage2Sites_MigratoryFish_NIS_Fig6.7

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Arklow Bank Wind Park 2

Sites Assessed at Stage 2 (AA) for Migratory Fish

Legend

- ABWP2 Array Area
- ABWP2 Cable Corridor and Working Area
- ABWP1 WTGs
- ABWP1 Existing Met Mast
- ABWP1 Existing Export Cable
- ABWP1 Array Area
- Special Area of Conservation (SAC)



Notes

Esri UK, Esri, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS, Esri UK, Esri, TomTom, Garmin, FAO, NOAA, USGS, Esri, GEBCO, Garmin, NaturalVue, Esri, USGS. Contains Ordnance Survey data © Crown copyright and database rights (2022). OS OpenData.

Coordinate System:
ETRS 1989 UTM Zone 30N

0 10 20 km

0 8 15 nm

Scale	Date	Drawn By	Checked By	Approved By
1:750,000 @ A3	05/04/2024	GB	EM	LK

Suites B2 & C2
Higher Mill
Higher Mill Lane
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Figure Number 6.7

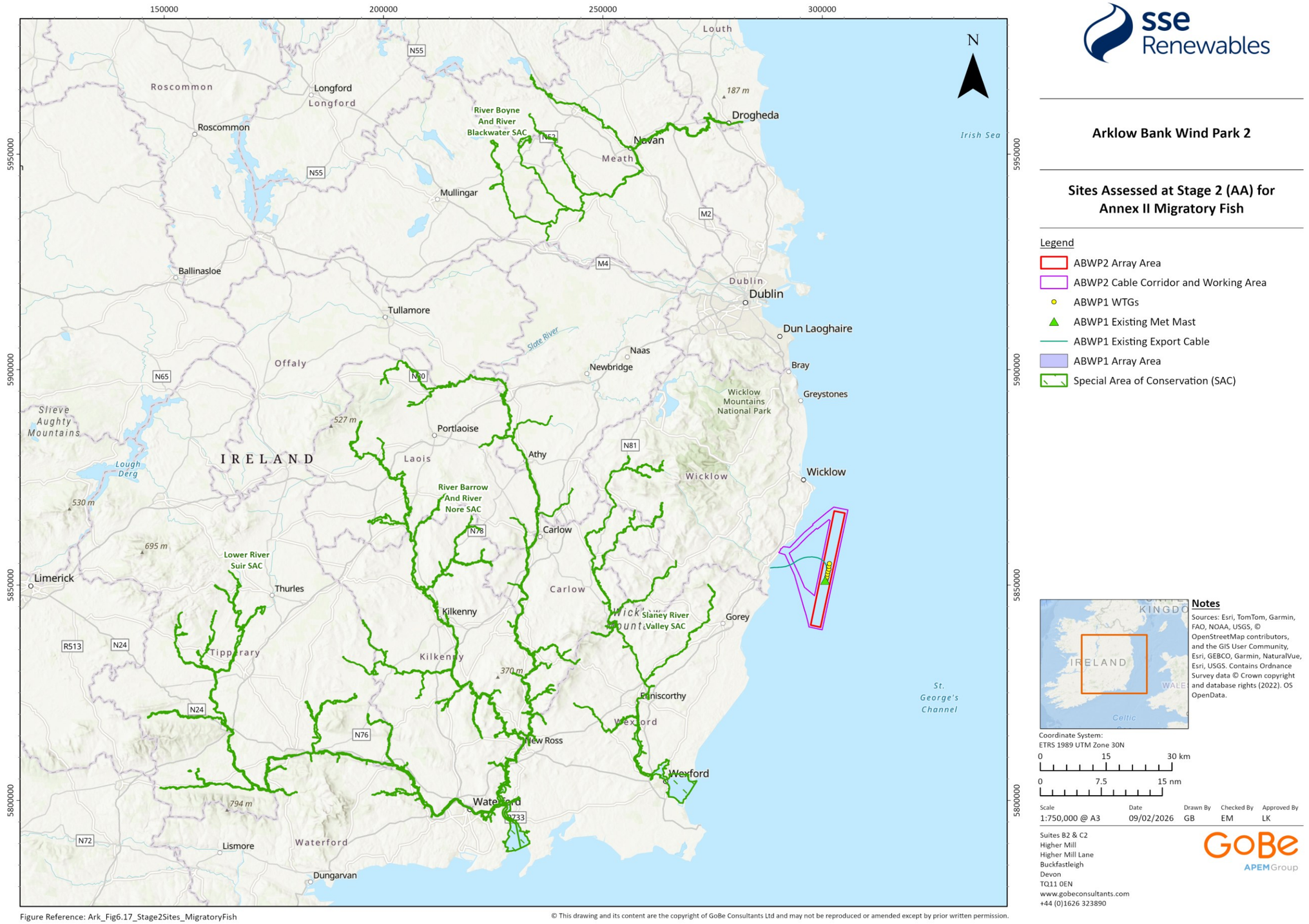

Figure 6.~~7~~17: Sites assessed at Stage 2 (AA) for Annex II Migratory Fish

6.5.2 Baseline Environment

6.5.2.1 The Irish Sea is characterised by a deep channel (the Western Channel) running north to south in the western Irish Sea, and extending north into the North Channel, between Northern Ireland and Scotland and south into St George's Channel, between Ireland and Wales (Mellet *et al.*, 2015). The Western Channel is considered to be an important feature in shaping the fish and shellfish assemblages (Parker-Humphreys, 2004). At its deepest point the channel is 230 m deep with an extensive area of relatively flat, shallow (< 60 m depth) seabed (the Eastern Platform) and a narrow shelf of shallow water to the west (the Western Trough) (Mellet *et al.*, 2015).

6.5.2.2 Fish assemblages within the ZoI are typical of the sandy and gravelly seabeds of the wider Western Irish Sea. Species noted during site specific surveys included plaice, dab, poor cod, sand eel *Ammodytes tobianus*, common dragonet *Callionymus lyra* and sand goby *Pomatoschistus minutus*, with sand eel and sand goby being particularly abundant in some years. Other commercial species noted included whiting, lemon sole *Microstomus kitt*, sole, John dory *Zeus faber* and turbot *Psetta maxima*.

6.5.2.3 The western Irish Sea is home to a number of diadromous fish species that migrate between the sea and freshwater at different stages of their lifecycle. Atlantic salmon *Salmo salar* and sea trout *Salmo trutta* are two commercially important species in the region. The rivers Slaney, Boyne, Dargle and Avoca on the east coast of Ireland are key rivers for migratory fish species (Celtic Sea Trout Project, 2016; Inland Fisheries Ireland, 2022). Sea lamprey *Petromyzon marinus*, river lamprey *Lampetra. fluviatilis*, and twaite shad *Allosa fallax* are known to occur in inshore waters off the coast of co. Wicklow (Inland Fisheries Ireland, 2018).

Site-specific survey summary

6.5.2.4 A summary of site-specific surveys undertaken to inform the Stage 2 appraisal on migratory fish is provided in ~~**Error! Unknown switch argument.**~~Table 6.2135.

Table 6.~~24~~35: Summary of site-specific survey data for migratory fish species

Data Source	Method	Date
Digital aerial marine mammal and bird surveys (ABWP2)	Aerial	February 2025 to July 2025
Digital aerial marine mammal and bird surveys (ABWP2)	Aerial	August 2023 to June 2024
Digital aerial marine mammal and bird surveys (ABWP2)	Aerial	March 2018 to April 2020
GE Wind Energy. Post-construction surveys (ABWP1)	Anchor dredge Beam trawl	June 2010 to September 2021
Arklow Energy Ltd (2010). Post-construction survey (ABWP1)	Anchor dredge Beam trawl	June 2009
HydroServ Projects Ltd. Post-construction surveys (ABWP1)	Anchor dredge Beam trawl	June 2004 to May 2008
EcoServe (2001). Baseline/pre-construction survey (ABWP1).	Anchor dredge Agassiz trawl	April 2001

Data Source	Method	Date
EcoServe (2001). Baseline/pre-construction survey (ABWP1).	Anchor dredge Otter trawl	September 2000
EcoServe (2001). Baseline/pre-construction survey (ABWP1).	Anchor dredge	June 2000

6.5.3 Avoidance through Design and Standard Project Environmental Protection Measures of the Proposed Development

6.5.3.1 The design of the Proposed Development is such that some potential impact can be avoided as seen by applying the design features and management measures relevant to migratory fish receptors which are presented in Table 6.~~22~~36Table 6.~~22~~36.

Table 6.~~22~~36: Project design and environmental protection measures relevant for migratory fish receptors

Measure	Justification
Scour protection	In the absence of scour protection, there is potential for scour pits to develop around foundations. This may result in the release of sediment into the water column and a change to seabed habitat in the vicinity of the foundation which may result in disturbance to migratory fish. Scour protection will be installed which will reduce the potential for suspended sediment.
The Developer confirms and commits that it will not carry out any works in respect of the Proposed Development under the planning permission (if granted) at the same time as any activities the subject of the Foreshore Licence for Site Investigations (FS007339).	The Developer was granted a Foreshore Licence (FS007339) for Site Investigations (associated with the Proposed Development) from the Minister for Housing, Local Government and Heritage in May 2022. This Foreshore Licence expires in 2027. The Developer confirms and commits that it will not carry out any works in respect of the Proposed Development under the planning permission (if granted) at the same time as any activities the subject of the Foreshore Licence for Site Investigations (FS007339) being carried out. As such there is no temporal overlap between the activities consented in this Foreshore Licence and the Proposed Development and there will be no potential for cumulative effects.
The Developer confirms and commits that it will not carry out any works in respect of the Proposed Development under the planning permission (if granted) at the same time as any activities ~~the~~ subject of the Foreshore Licence Application for Site Surveys FS007555 ~~(should a licence be granted)~~ are being carried out.	The Developer submitted a Foreshore Licence Application for Site Surveys to the Minister for Housing, Local Government and Heritage in April 2023 (FS007555) and this application ~~is pending determination~~This application was determined and granted on 04 July 2024 and is valid until 04 June 2029. The Developer confirms and commits that it will not carry out any works in respect of the Proposed Development under the planning permission (if granted) at the same time as any activities the subject of the Foreshore Licence Application for Site Surveys FS007555 (should a licence be granted) are being carried out. As such there is no temporal overlap between the activities proposed in the Foreshore Licence Application and the Proposed Development.

Measure	Justification
Impact avoidance/ reduction through implementation of a Construction and Operational and Maintenance activities are detailed in Volume I, Supporting Information for Screening for Appropriate Assessment Report.	The construction activities including cable plans, techniques and burial depths are detailed in EIAR Volume II, Chapter 4: Description of Development (Revised March 2026). Operational and maintenance activities are also set out in EIAR Volume II, Chapter 4: Description of Development (Revised March 2026). These methods are set out using best practice guidelines to reduce the potential for impacts on marine habitats and megafauna including migratory fish.
Impact avoidance/ reduction through development of and adherence to a Rehabilitation Schedule (NIS Volume III, Appendix 4.1: Rehabilitation Schedule).	The Rehabilitation Schedule describes measures for the decommissioning of the Proposed Development. Measures which will be implemented that will mitigate against effects on fish, shellfish and sea turtle include leaving scour protection in-situ.
Impact avoidance/ reduction through implementation of an Environmental ~~Vessel Management Plan (EVMP) (~~VMP (NIS Volume III, Appendix 25.10: Environmental Vessel Management Plan)	The implementation of an Environmental VMP which includes best practice guidance measures to minimise the potential for collision risk, potential injury to, and disturbance of marine megafauna from vessel activities.
Impact avoidance/ reduction through development of and implementation of an ~~Environmental Management Plan (~~EMP~~)~~ (NIS Volume III, Appendix 25.1: Environmental Management Plan (Revised March 2026)).	This will include mitigation/monitoring measures and commitments made within the EIAR, including but not limited to chemical usage, invasive and non-native species, pollution prevention and waste management. These measures are set out using best practice guidelines to reduce the potential for impacts on marine habitats and megafauna including migratory fish.
Impact avoidance/ reduction through implementation of a Marine Pollution Contingency Plan will be included in the EMP (NIS Volume III, Appendix 25.1: Environmental Management Plan (Revised March 2026), Annex 2).	Ensures plans are in place to manage any marine pollution spills including key emergency contact details. These measures are set out using best practice guidelines to reduce the potential for impacts on marine habitats and megafauna including migratory fish.
Impact avoidance/ reduction through implementation of an Invasive Non-Indigenous Species Management Plan will be implemented and will be included in the EMP (NIS Volume III, Appendix 25.1: Environmental Management Plan (Revised March 2026), Annex 4)	The plan outlines measures to ensure vessels comply with the International Maritime Organisation (IMO) ballast water management guidelines, it will consider the origin of vessels and contain standard housekeeping measures for such vessels as well as measures to be adopted in the event that a high alert species is recorded. These measures are set out to reduce the potential for impacts on marine habitats and megafauna including migratory fish.
Impact avoidance/ reduction through development of and adherence to ~~Marine Mammal Mitigation Plan (~~a MMMP~~)~~ (NIS Volume III, Appendix 25.2: Marine Mammal Mitigation Plan (Revised March 2026))	This will identify appropriate mitigation measures during offshore activities that are likely to produce underwater noise and vibration levels capable of potentially causing injury or disturbance to marine mammals. Factored-in measures adopted to reduce the risk of impact to marine mammal receptors will also be employed to reduce the risks to other marine megafauna that can be visually detected on the surface of the sea such as migratory fish.
Impact avoidance/ reduction through implementation of an Environmental Monitoring Measures are set out in ~~the SISAA~~NIS Volume I: Supporting Information for Screening for Appropriate	EIAR Volume II, Chapter 25: Summary of Factored in Measures, Mitigation and Monitoring (Revised March 2026) sets out commitments to environmental monitoring in pre-, during and post-construction phases.

Measure	Justification
Assessment (Revised March 2026), Section:4 Tables 4.27 to 4.33.	
Impact avoidance/ reduction through cables being buried where possible and protected where not possible.	Reduces the effect of Electromagnetic Fields (EMF). As EMF can have an adverse effect on migratory fish, burying cables will reduce the potential effects on migratory fish.

6.5.4 Impacts and Parameters Assessed

6.5.4.1 Both Project Design Options identified in Table 6.~~23~~37Table 6.~~23~~37 have the same potential to result in the effects on migratory fish species.

Table 6.~~23~~37: Project Design Options 1 and 2 considered for the assessment of potential impacts on migratory fish receptors

Potential impact	Phase			Project Design Option Assessed (1 and 2)	Parameter Differences Between Project Design Option 1 and 2 (if any)
	C	O	D		
Injury and/or disturbance from UWN and vibration during pile driving and cable installation	✓	✓	X	<u>Project Design Option 1:</u> **Construction phase:** <u>Foundation installation:</u> WTGs installed on monopile foundations: • Installation of ~~56~~53 WTGs with a pile ~~diametre~~diameter between 7 m and 11 m within the Array Area; • Maximum of one foundation installed at any one time (within any 24-hour period); • Maximum hammer energy ~~6,600 kJ, average hammer energy 4,400~~3,500 kJ and a strike rate of 30 strikes per minute; • Soft start at 825 kJ; • Anticipated maximum duration of piling at 5 hours and 10 minutes per day with an average duration of 4 hours per pile and; • Total of ~~75~~71 days when piling may occur over construction period, which may last up to ~~5~~4 years. Offshore Substations Platforms (OSP) installed on monopile foundations: • Installation of two OSPs with a pile ~~diametre~~diameter between 7 and 14 m within the Array Area; • Maximum of one foundation installed at any one time (within any 24 hour period); • Maximum hammer energy ~~6,600kJ and an average hammer energy 6,000 kJ~~3,500kJ; • Soft start at 825 kJ; • Average duration of 4 hours per pile and; • Total of 4 days when piling may occur over construction period.	Within the construction phase Project Design Option 1 consists of a larger number of foundations to be installed – ~~58~~55 monopile foundations in total (~~56~~53 for WTGs and 2 for OSPs), whilst Project Design Option 2 comprises of 47 foundations in total (47 for WTGs and 2 for OSPs). Therefore, Project Design Option 1 will have a marginally greater potential for UWN from piling activities and is considered representative of potential impacts from Project Design Option 2.

Potential impact	Phase C O D	Project Design Option Assessed (1 and 2)	Parameter Differences Between Project Design Option 1 and 2 (if any)
		Detonation of UXO's. **Operational and maintenance phase** • ~~56~~53 operational WTGs • Cable repair once every 3 years and cable re-burial once every 3 years for inter-array and interconnector cables. • For export cables, cable repair once every 5 years and cable re-burial once every 5 years. • Operational dredging once every 5 years. • Geophysical surveys every 6 months for first two years and annually thereafter.	
		Project Design Option 2 **Construction Phase:** Foundation installation: WTGs and OSPs installed on monopile foundations: • Installation of 47 WTGs with a pile ~~diametre~~diameter between 7 m and 11 m within the Array Area; • Maximum of one foundation installed at any one time (within any 24 hour period); • Maximum hammer energy up to ~~6,600 kJ, average hammer energy up to 4,400~~3,500 kJ and a strike rate of 30 strikes per minute; • Soft start energy of 825 kJ; • Anticipated maximum duration of piling at 5 hours and 10 minutes per day with an average duration of 4 hours per pile; and • Total of 63 days when piling may occur over construction period, which may last up to ~~5~~4 years.	

Potential impact	Phase C	Phase O	Phase D	Project Design Option Assessed (1 and 2)	Parameter Differences Between Project Design Option 1 and 2 (if any)
				OSPs installed on monopile foundations: • Installation of 2 OSPs with a pile ~~diametre~~diameter between 7 m and 14 m within the Array Area; • Maximum of one foundation installed at any one time (within any 24 hour period); • Maximum hammer energy up to ~~6,600 kJ and an average hammer energy up to 6,000~~3,500 kJ; • Soft start of 825 kJ; • Average duration of 4 hours per pile; and • Total of 4 days when piling may occur over construction period. Detonation of UXO's. **Operational and maintenance phase**: • 47 operational WTGs • Cable repair once every 3 years and cable re-burial once every 3 years for inter-array and interconnector cables. • For export cables, cable repair once every 5 years and cable re-burial once every 5 years. • Operational dredging once every 5 years. • Geophysical surveys every 6 months for first two years and annually thereafter.	
UWN from other activities	✓	✓	✓	Project Design Option 1 **Construction Phase:** • Installation of between 110 and 122 km inter-array cables and between 35 and 40 km offshore export cables; and • Up to 4,150 vessel round trips and up to 294 helicopter round trips during the construction phase.	Within the Construction phase, both Project Design Option 1 and 2 have the same level of potential impact from UWN from Other Activities.

Potential impact	Phase C O D	Project Design Option Assessed (1 and 2)	Parameter Differences Between Project Design Option 1 and 2 (if any)
		Operational and Maintenance phase: • Up to 1,359 vessel round trips per year and 485 helicopter round trips per year. • ~~56~~53 operational WTGs • Cable repair once every 3 years and cable re-burial once every 3 years for inter-array and interconnector cables. • For export cables, cable repair once every 5 years and cable re-burial once every 5 years. • Operational dredging once every 5 years. • Geophysical surveys every 6 months for first two years and annually thereafter. **Decommissioning Phase:** • Decommissioning of up to ~~56~~53 WTGs and up to 2 OSP.	Within the Operational and Maintenance Phase, both Project Design Option 1 and 2 have the same level of potential impact. Within the Decommissioning Phase, both Project Design Option 1 and 2 have the same level of potential impact from UWN from Other Activities.
		Project Design Option 2 **Construction Phase:** • Installation between 110 and 122 km inter-array cables and between 35 and 40 km offshore export cables; and Up to 4,150 vessel round trips and up to 294 helicopter round trips during the construction phase. **Operational and Maintenance phase:** • Up to 1,294 vessel round trips per year and 485 helicopter round trips per year. • 47 operational WTGs • Cable repair once every 3 years and cable re-burial once every 3 years for inter-array and interconnector cables. • For export cables, cable repair once every 5 years and cable re-burial once every 5 years. • Operational dredging once every 5 years.	

Potential impact	Phase			Project Design Option Assessed (1 and 2)	Parameter Differences Between Project Design Option 1 and 2 (if any)
	C	O	D		
				• Geophysical surveys every 6 months for first two years and annually thereafter. **Decommissioning Phase:** • Decommissioning of up to 47 WTGs and up to 2 OSP.	
EMF	X	✓	X	Project Design Option 1 **Operational and Maintenance phase:** Presence of inter-array, OSP interconnector, and offshore export cables: • 66 kV inter-array cables between 110 – 122 km in length. • 220 kV OSP interconnector cables between 25 – 28 km in length. • 220 kV offshore export cables between 35 – 40 km in length. • Burial depth between 0-1.5 m for inter-array cables and 0-2.5 m for OSP interconnector and offshore export cables. • 15% of inter-array cable routes, 50% of OSP interconnector cable routes, and 20% of export cable routes requiring protection. • Third party export cable crossings. • Operational phase of 36.5 years. • Cable protection system (up to 1.5 m in ~~diametre~~diameter) comprising concrete, polyurethane, steel, cast iron shells, high density polyethylene and/or plastic ducts. Project Design Option 2: **Operational and Maintenance phase:** Presence of inter-array, OSP interconnector, and offshore export cables: • 66 kV inter-array cables between 110 – 122 km in length. • 220 kV OSP interconnector cables between 25 – 28 km in length.	No differences in parameters for EMF for Project Design Option 1 and Project Design Option 2.

Potential impact	Phase C	Phase O	Phase D	Project Design Option Assessed (1 and 2)	Parameter Differences Between Project Design Option 1 and 2 (if any)
				• 220 kV offshore export cables between 35 – 40 km in length. • Burial depth between 0-1.5 m for inter-array cables and 0-2.5 m for OSP interconnector and offshore export cables. • 15% of inter-array cable routes, 50% of OSP interconnector cable routes, and 20% of export cable routes requiring protection. • Third party export cable crossings. • Operational phase of 36.5 years. • Cable protection system (up to 1.5 m in ~~diametre~~diameter) comprising concrete, polyurethane, steel, cast iron shells, high density polyethylene and/or plastic ducts.	
Accidental pollution	✓	✓	✓	Project Design Option 1 **Construction phase** Accidental pollution within the Proposed Development construction phase from: • Installation of 53 WTGs and two OSPs within the Array Area. • Installation of inter-array cables between 110 – 122 km in length, OSP interconnector cables between 25 – 28 km in length, and offshore export cables between 35 – 40 km in length; • 66 vessels on site at one time comprised of jack up barges, cargo, support, tug/anchor, cable installation, guard, survey, crew transfer, sandwave clearance and UXO clearance vessels. • 4,150 return trips across construction period and 1,797 return trips per year. • Construction schedule of 24 hours a day, 7 days a week for a period of 4 years. • 294 helicopter return trips over the construction phase and 118 helicopter return trips per year.	Within the construction phase Project Design Option 1 consists of a larger number of foundations to be installed – 55 monopile foundations in total (53 for WTGs and 2 for OSPs), whilst Project Design Option 2 comprises of 47 foundations in total (47 for WTGs and 2 for OSPs). Therefore, Project Design Option 1 will have a marginally greater potential for accidental pollution.

Potential impact	Phase C	Phase O	Phase D	Project Design Option Assessed (1 and 2)	Parameter Differences Between Project Design Option 1 and 2 (if any)
				Operational and maintenance phase Accidental pollution within the Proposed Development during the operational and maintenance phase from: • 30 vessels on site at one time comprised of crew transfer, jack-up, cable repair, service operations, cable survey and excavator vessels. • 1,359 return trips per year. • 485 helicopter return trips per year; • Presence of 53 WTGs and 2 OSPs and; • Maintenance activities of 53 WTGs and 2 OSPs **Decommissioning phase** Accidental pollution in the Array Area during decommissioning from: Decommissioning of 53 WTGs and 2 OSPs	
				Project Design Option 2 **Construction phase** Accidental pollution within the Proposed Development construction phase from: • Installation of 47 WTGs and 2 OSPs within the Array Area. • Installation of inter-array cables between 110 – 122 km in length, OSP interconnector cables between 25 – 28 km in length, and offshore export cables between 35 – 40 km in length; • 66 vessels on site at one time comprised of jack up barges, cargo, support, tug/anchor, cable installation, guard, survey, crew transfer, sandwave clearance and UXO clearance vessels.	

Potential impact	Phase			Project Design Option Assessed (1 and 2)	Parameter Differences Between Project Design Option 1 and 2 (if any)
	C	O	D		
				• 4,150 return trips across construction period and 1,797 return trips per year. • Construction schedule of 24 hours a day, 7 days a week for a period of 4 years. • 294 helicopter return trips over the construction phase and 118 helicopter return trips per year. **Operational and maintenance phase** Accidental pollution within the Proposed Development during the operational and maintenance phase from: • 30 vessels on site at one time comprised of crew transfer, jack-up, cable repair, service operations, cable survey and excavator vessels. • 1,359 return trips per year. • 485 helicopter return trips per year; • Presence of 47 WTGs and 2 OSPs and; • Maintenance activities of 47 WTGs and 2 OSPs **Decommissioning phase** Accidental pollution in the Array Area during decommissioning from: Decommissioning of 47 WTGs and 2 OSPs	

6.6 Assessment of Proposed Development alone for Migratory Fish QIs

6.6.1 Slaney River Valley SAC

Twaite Shad

6.6.1.1 The ~~conservation objectives~~COs for twaite shad at this designated site is to restore the favourable conservation condition of the ~~feature~~QI, this is defined and presented in Table 5.1.

6.6.1.2 There are ~~three~~four key potential ~~impacts on~~impact pathways considered for twaite shad associated with construction, operational and maintenance, and decommissioning of the Proposed Development, which are presented in Table 6.~~23~~37Table 6.~~23~~37 and are assessed below for each phase of the Proposed Development.

INJURY AND/ OR DISTURBANCE FROM UNDERWATER NOISE – PILING AND OTHER ACTIVITIES

6.6.1.3 Underwater noise and vibration within the Array Area and Cable Corridor and Working Area will occur during the construction, operational and maintenance, and decommissioning phases as a result of a range of activities including impact piling, cable laying, dredging, drilling, rock placement, vessel movements, operational WTG noise, and ~~unexploded ordnance (~~UXO~~)~~ clearance. This can cause injury and/or disturbance to fish and shellfish.

6.6.1.4 The assessment has been informed by the Underwater Noise Assessment by Subacoustech (NIS Volume III, Appendix 11.1: Underwater Noise Assessment (Revised March 2026)) which includes the results of numerical modelling using the INSPIRE underwater noise model.

6.6.1.5 Two precautionary piling foundation scenarios were used for modelling:

- 11 m monopile foundations at the N, C and SW WTG locations, installed with a maximum blow energy of 3,500 kJ; and
- 14 m monopile foundations at the N-OSP and S-OSP location, installed with a maximum blow energy of 3,500 kJ.

6.6.1.6 For each foundation scenario, two mitigation scenarios were assessed: a ramp-up mitigation scenario (considered the base-case) and an extended ramp-up mitigation scenario. Both piling scenarios assume the same maximum hammer energy (3,500 kJ), but differ in soft-start energy levels, with ramp-up commencing at 825 kJ under the base-case ramp up mitigation scenario and at 400 kJ under the extended ramp-up mitigation scenario. Further details of these scenarios are provided in Underwater Noise Assessment (NIS Volume III, Appendix 11.1: Underwater Noise Assessment (Revised March 2026)).

6.6.1.7 ~~6.6.1.5~~ Underwater noise and vibration may cause the following effects on fish:

- Behavioural effects (e.g. reduced detection of predators/prey, inhibited communication between conspecifics, alteration in swimming behaviour);
- Masking effects (i.e. the reduced detectability of a given sound owing to the simultaneous occurrence of another sound);
- Temporary threshold shift (TTS) in hearing (short or long-term changes in hearing sensitivity that may or may not reduce fitness);
- Recoverable tissue injury (not resulting in mortality e.g. hair cell damage, minor internal or external hematoma etc.); and
- Mortality or potential mortal injury (immediate or delayed death).

6.6.1.8 ~~6.6.1.6~~ There can also be vibration effects within the immediate vicinity of piling or other sources of noise that can cause slight movement of sediment that in turn may have an effect on the behaviour of benthic fish species or could potentially affect the viability of fish eggs near the source (Popper ~~&~~and Hawkins, 2018). Vibration can also refer to the effects of particle motion (separate from sound pressure) in the water column. However, very little research has been conducted on the effects of vibration on fish. Noise and vibration are produced at the same time and are interconnected and so for the purposes of this assessment we have referred to them together as appropriate.

6.6.1.9 ~~6.6.1.7~~ Hearing abilities of fish are related to the morphological adaptations of the acousticolateralis apparatus, in particular the distance of the swim bladder to the inner ear (Hastings ~~&~~and Popper, 2005; Mason, 2013). Species with no swim bladder (e.g. Sea and river lamprey) have a lower hearing ability than many other fish species and rely on the detection of particle motion (the oscillatory displacement of fluid particles in a sound field) (Popper *et al.*, 2014). They are considered to have a low sensitivity to underwater noise and vibration effects.

6.6.1.10 ~~6.6.1.8~~ Fish species with a swim bladder but with no connection to the inner ear (e.g. salmon) have better hearing but can also only detect particle motion. They are considered to have a medium sensitivity to underwater noise and vibration effects.

6.6.1.11 ~~6.6.1.9~~ Species that have an extension of the swim bladder that terminates in the inner ear (e.g. Twaite shad) can hear sounds over a far greater range than other species (Popper *et al.*, 2014; Gill *et al.*, 2012) and can detect both particle motion and sound pressure (a form of stress measured in terms of force/unit area). They are considered to have a high sensitivity to underwater noise and vibration effects.

6.6.1.12 ~~6.6.1.10~~ Popper *et al.* (2014) provides criteria that can be applied to assess the potential effects of noise and vibration on fish from different marine activities such as piling, dredging and vessel movements (~~**Error! Unknown switch argument.**~~Table 6.2438). The approach assesses the potential effects of underwater noise and vibration on fish based on grouping species according to their hearing apparatus, specifically whether they have no swim bladder, they have a swim bladder but it is not involved in hearing, or they have a swim bladder which is involved in hearing (Popper *et al.* 2014).

6.6.1.13 ~~6.6.1.11~~ The noise levels are based on consideration of peak noise (SPL_{peak}, the maximum absolute value of the instantaneous sound pressure during a specified time interval), and cumulative Sound Exposure Level (SEL_{cum}) which is the linear summation of the individual sound events over the time period of interest (NIS Volume III, Appendix 11.1: ~~Subsea Noise Technical Report~~Underwater Noise Assessment (Revised 2026) for further details).

6.6.1.14 ~~6.6.1.12~~ Insufficient data exists to make a recommendation for guidelines in relation to masking effects or behavioural effects and therefore a qualitative approach has been adopted in which relative risk of an effect is placed in order of rank at three distances from the source – near (N) (tens of metres from the source), intermediate (I) (hundreds of metres from the source) and far (F) (thousands of metres from the source) (refer to ~~**Error! Unknown switch argument.**~~Table 6.2438).

6.6.1.15 As mentioned in Section 4 above, two piling scenarios have been modelled (a ramp-up mitigation scenario and an extended ramp-up mitigation scenario; see NIS Volume III, Appendix 11.1: Underwater Noise Assessment (Revised March 2026)). For the purposes of this assessment, the ramp-up mitigation scenario (the base-case) is applied, as it represents the greatest spatial extent over which the relevant thresholds of effect given in Table 6.2438 are exceeded. The extended ramp-up scenario represents additional mitigation committed by the Applicant in order to further reduce the potential significance of underwater noise effects. As demonstrated by the modelling (see NIS Volume III, Appendix 11.1: Underwater Noise Assessment (Revised March 2026)), this

scenario results in a reduced spatial extent of effect compared to the ramp-up mitigation scenario. Accordingly, while the assessment conclusions are based on the ramp-up mitigation scenario, the Proposed Development will implement the extended ramp-up mitigation in practice, meaning that actual effects are expected to be equal to or less than those assessed.

Table 6.~~24~~38: Mortality, potential injury, temporary threshold shift, masking and behaviour criteria for fish and shellfish in relation to pile driving noise (Popper *et al.*, 2014)

Fish grouping	Impairment				
	Mortality and potential mortal injury	Recoverable injury	Temporary Threshold Shift (TTS)	Masking	Behaviour
No swim bladder (particle motion detection)	>219 dB SEL_{cum} or >213 dB SPL_{peak}	>216 dB SEL_{cum} or >213 dB SPL_{peak}	>186 dB SEL_{cum}	(N) Moderate (I) Low (F) Low	(N) High (I) Moderate (F) Low
Swim bladder is not involved in hearing (particle motion detection)	>210 dB SEL_{cum} or >207 dB SPL_{peak}	>203 dB SEL_{cum} or >207 dB SPL_{peak}	>186 dB SEL_{cum}	(N) Moderate (I) Low (F) Low	(N) High (I) Moderate (F) Low
Swim bladder is involved in hearing (primarily pressure detection)	>207 dB SEL_{cum} or >207 dB SPL_{peak}	>203 dB SEL_{cum} or >207 dB SPL_{peak}	>186 dB SEL_{cum}	(N) High (I) High (F) Moderate	(N) High (I) High (F) Moderate

6.6.1.16 ~~6.6.1.13~~ For continuous noise sources such as vibropiling, dredging and vessel noise, quantitative criteria for assessment are only available for recoverable injury and TTS for fish with a swim bladder involved in hearing. For other potential effects (i.e. masking and behaviour changes) the qualitative approach described in Table 6.~~25~~39Table 6.~~25~~39 is applicable.

Table 6.~~25~~39: Mortality, potential injury, temporary threshold shift, masking and behaviour criteria for fish and shellfish in relation to vessel noise and other continuous sounds (Popper *et al.*, 2014)

Fish grouping	Impairment				
	Mortality and potential mortal injury	Recoverable injury	Temporary Threshold Shift	Masking	Behaviour
No swim bladder (particle motion detection)	(N) Low (I) Low (F) Low	(N) Low (I) Low (F) Low	(N) Moderate (I) Low (F) Low	(N) High (I) High (F) Moderate	(N) Moderate (I) Moderate (F) Low
Swim bladder is not involved in hearing (particle motion detection)	(N) Low (I) Low (F) Low	(N) Low (I) Low (F) Low	(N) Moderate (I) Low (F) Low	(N) High (I) High (F) Moderate	(N) Moderate (I) Moderate (F) Low
Swim bladder is involved in hearing (primarily pressure detection)	(N) Low (I) Low (F) Low	170 dB SPL_{rms} for 48 hrs	158 dB SPL_{rms} for 12 hours	(N) High (I) High (F) High	(N) High (I) Moderate (F) Low

6.6.1.17 ~~6.6.1.14~~ The results of noise modelling for the piling of 11 m monopiles within the Array Area ~~and ECC~~ for Group 1, 2 and 3 fleeing receptors can be seen in ~~Figure 6.818,~~ Figure 6.~~9~~19 ~~and~~ Figure 6.~~10~~20 ~~Figure 6.818,~~ Figure 6.~~9~~19 and Figure 6.~~10~~20 respectively.

6.6.1.18 The results of noise modelling for the piling of 14 m monopiles within the Array Area ~~and ECC~~ for Group 1, 2 and 3 fleeing receptors can be seen in Figure 6.~~11~~21, ~~Figure 6.1222 and Figure 6.1323~~Figure 6.~~11~~21, Figure 6.~~12~~22 and Figure 6.~~13~~23.

~~6.6.1.15~~

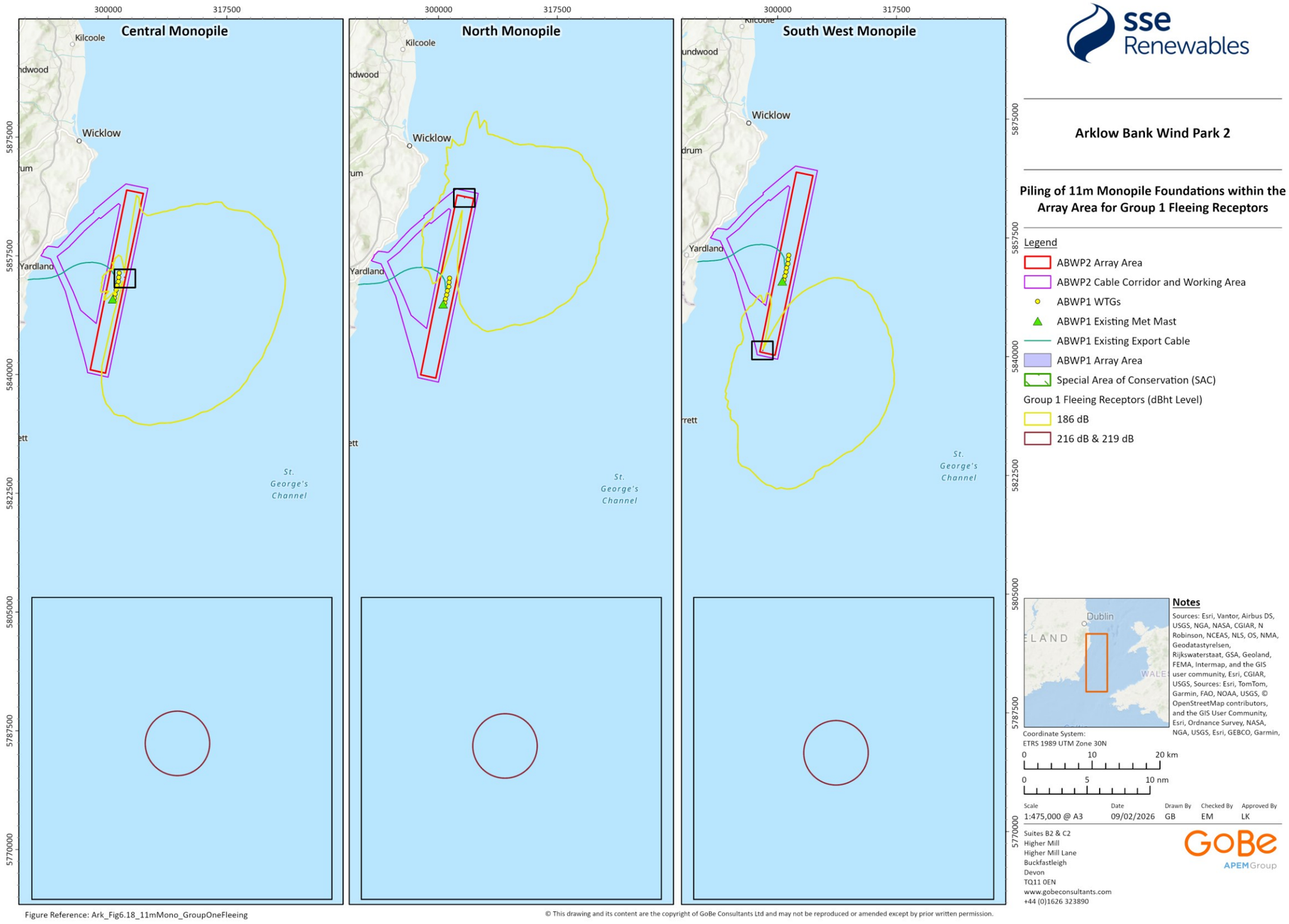

Figure Reference: Ark_Fig6.18_11mMono_GroupOneFleeing

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Figure 6.818: Piling of 11 m Monopile Foundations within the Array Area for Group 1 fleeing receptors

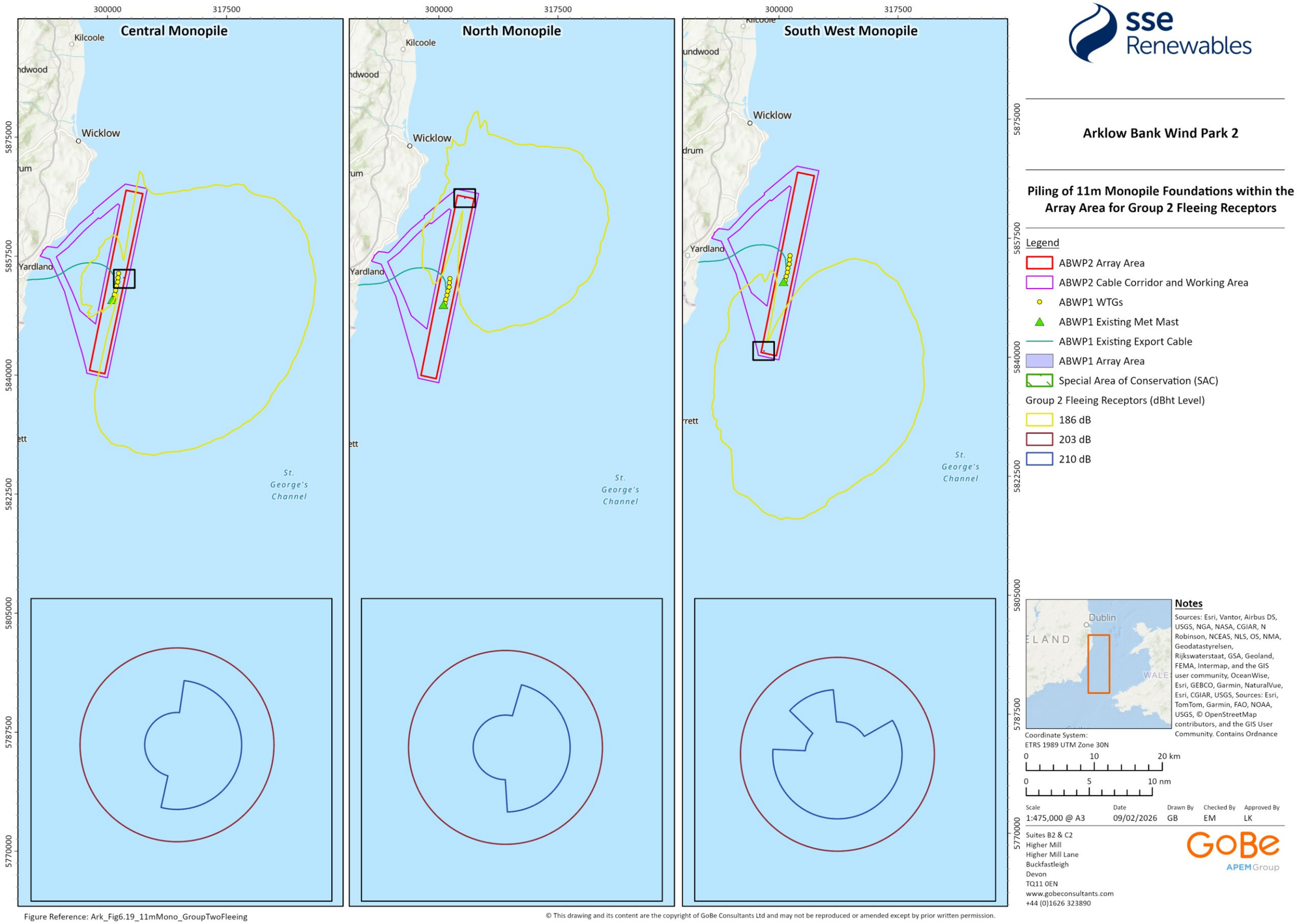

Figure Reference: Ark_Fig6.19_11mMono_GroupTwoFleeing

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Figure 6.919: Piling of 11 m Monopile Foundations within the Array Area for Group 2 fleeing receptors

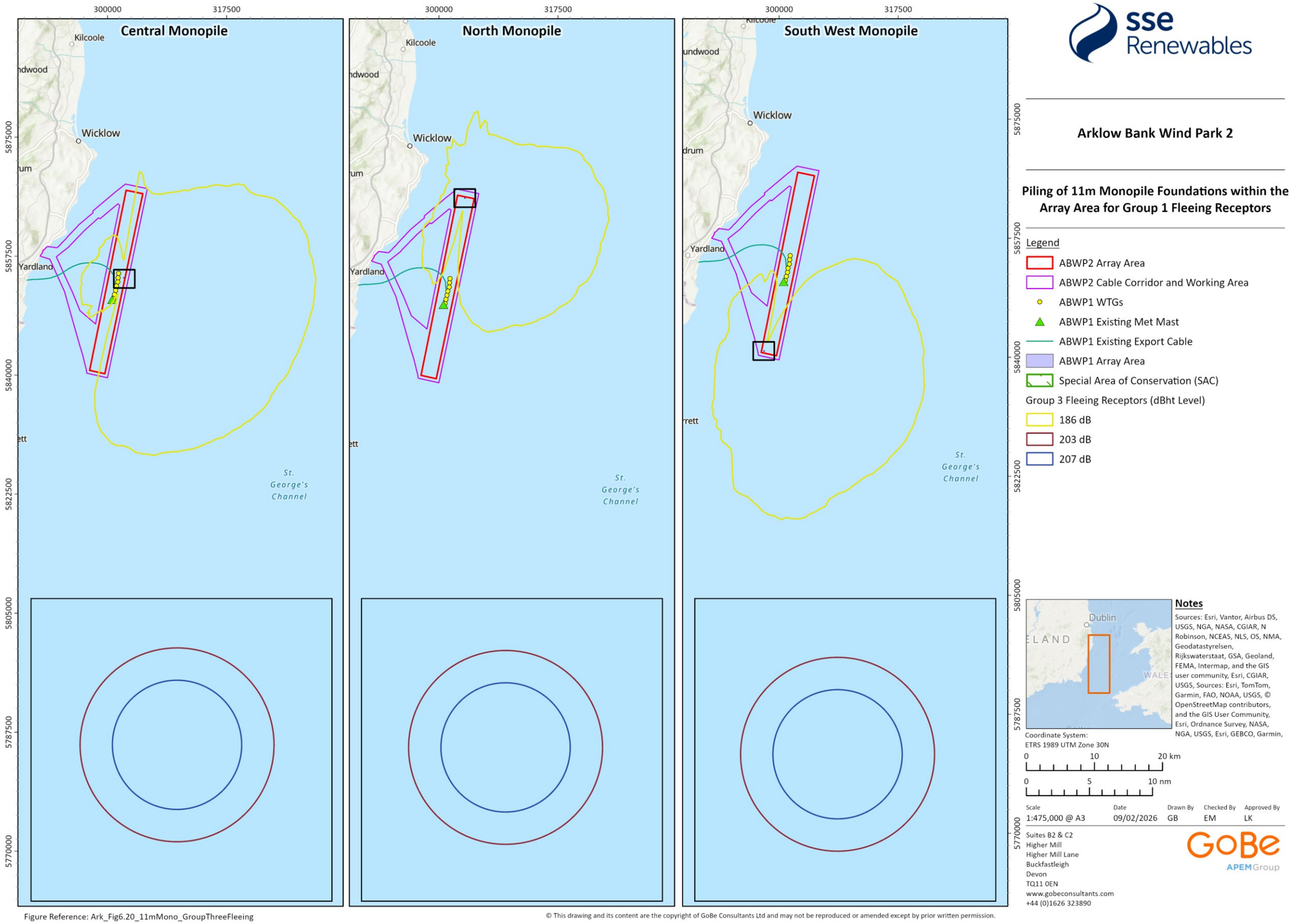

Figure 6.~~10~~20: Piling of 11 m Monopile Foundations within the Array Area for Group 3 fleeing receptors

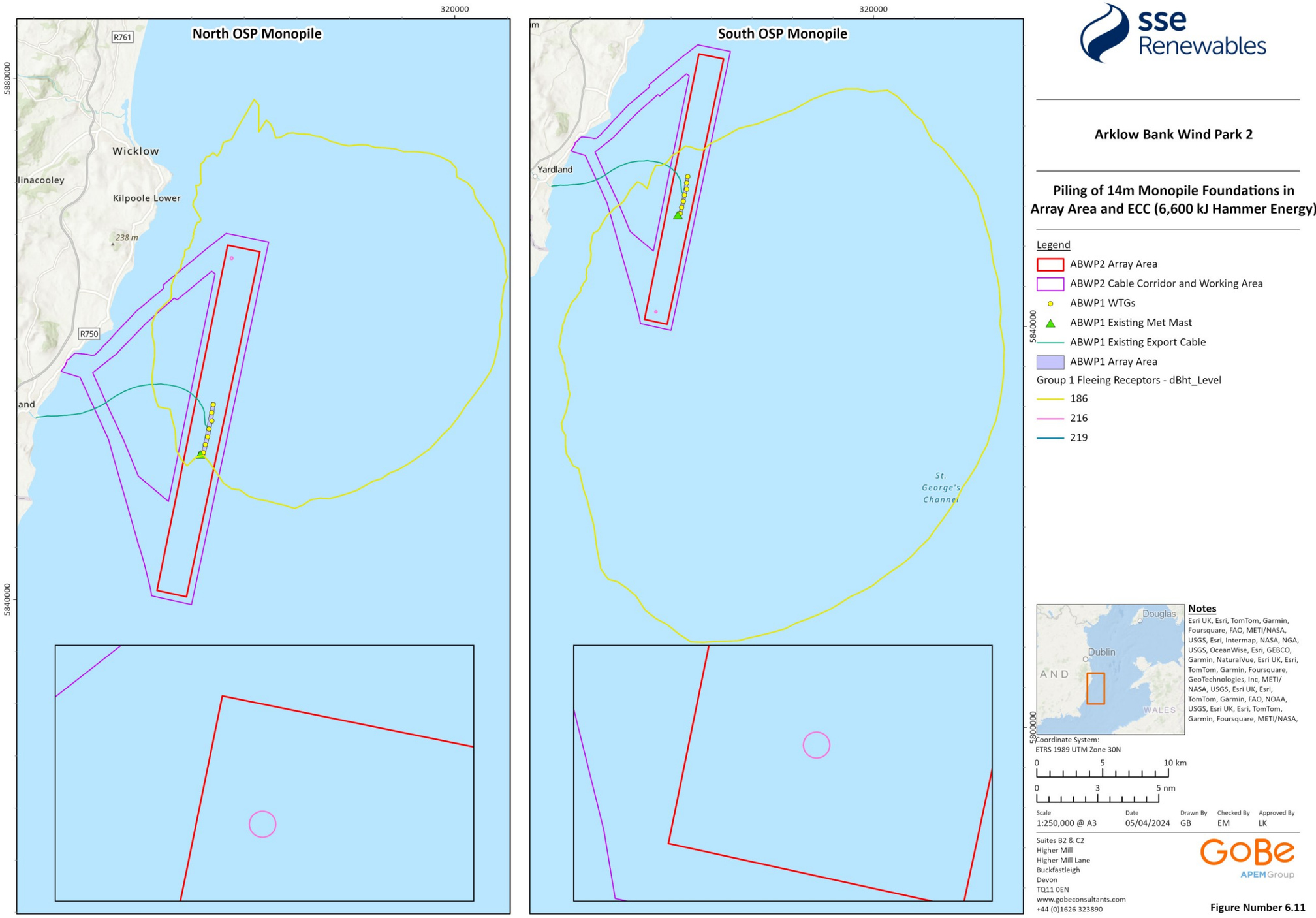

Figure Reference: Ark_011_14mMono_GroupOneFleeingReceptorsOSPs_NIS_Fig6.11

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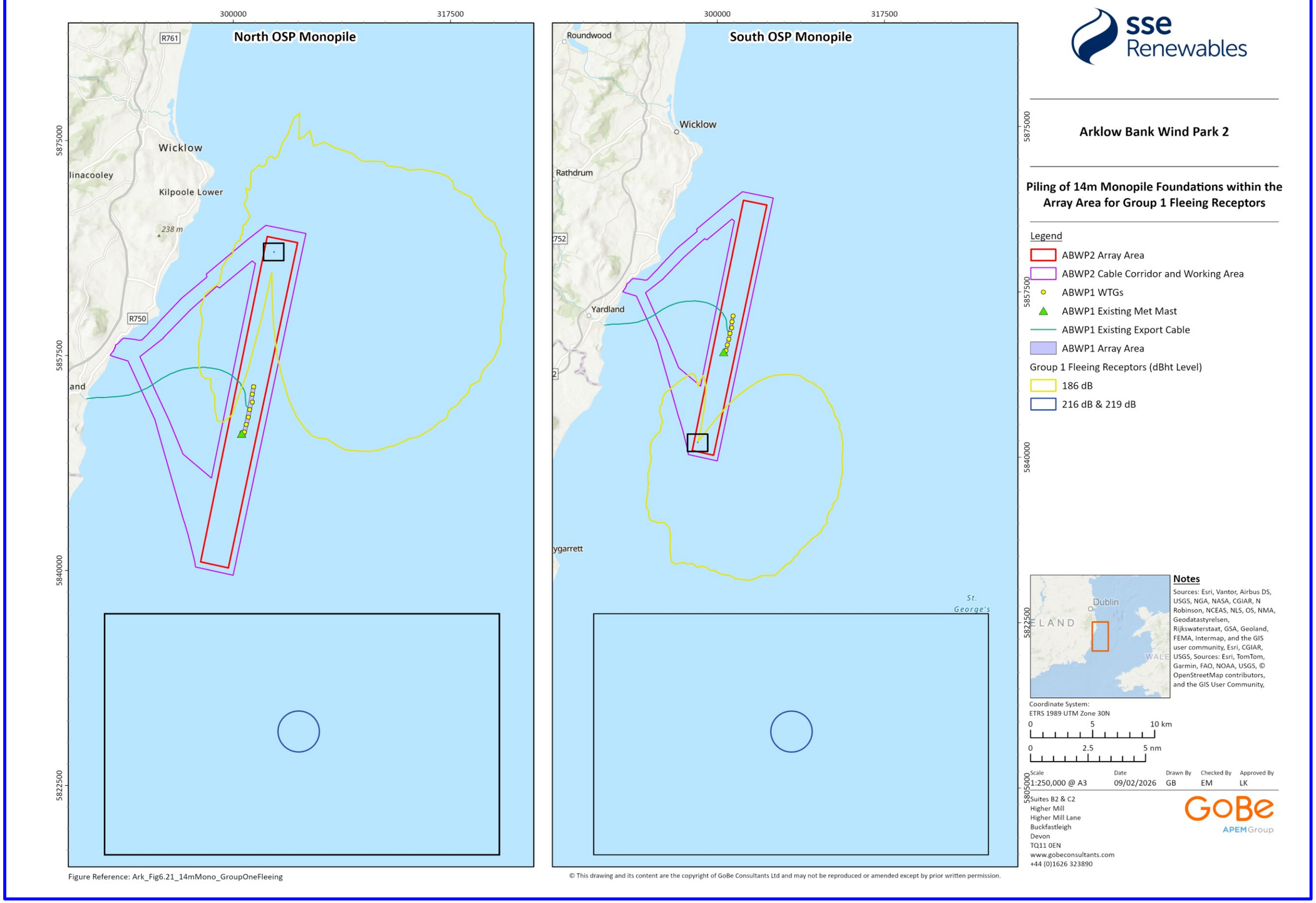
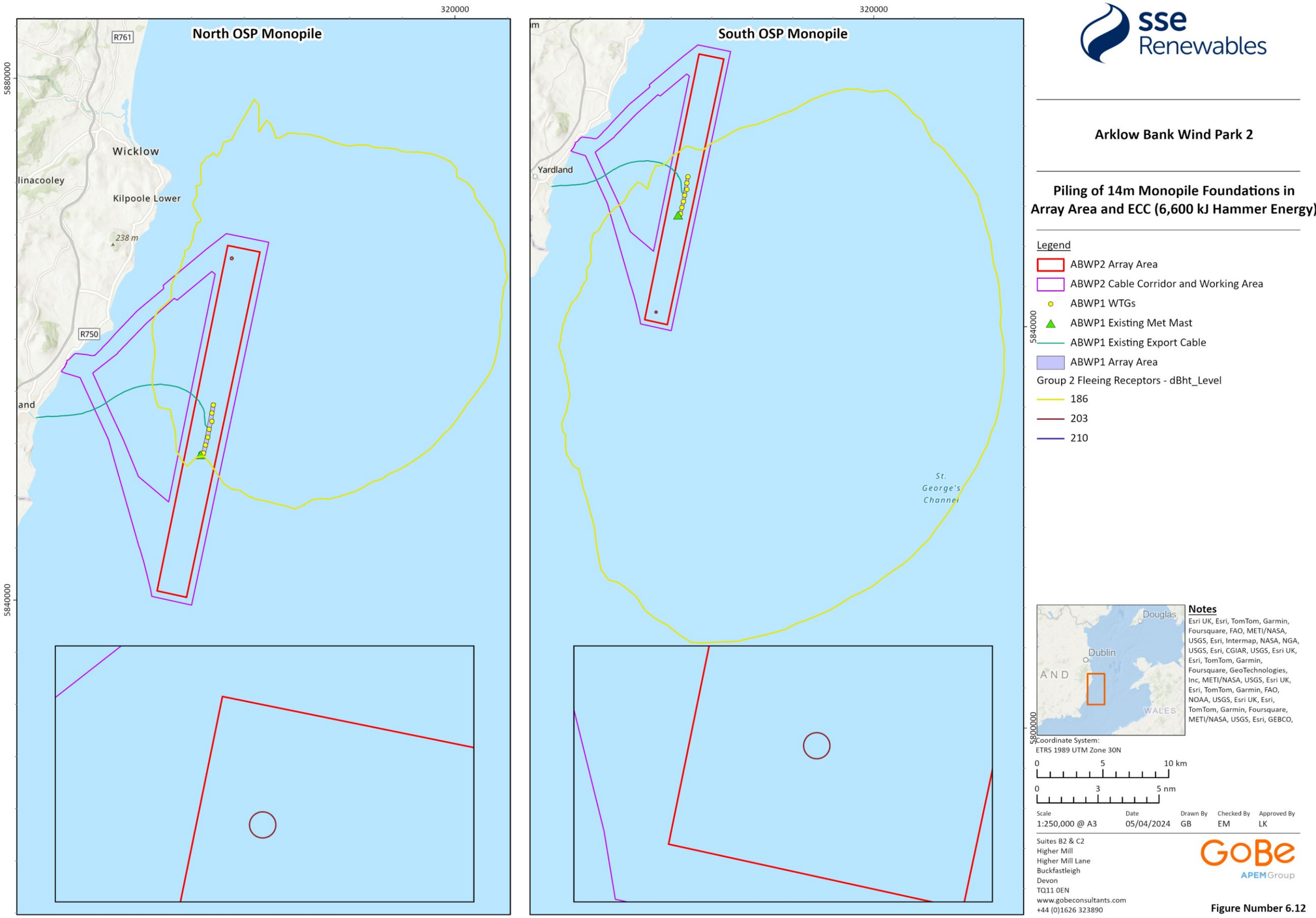


Figure 6.~~11~~21: Piling of 14 m Monopile Foundations within the Array Area for Group 1 fleeing receptors



sse Renewables

Arklow Bank Wind Park 2

Piling of 14m Monopile Foundations in Array Area and ECC (6,600 kJ Hammer Energy)

Legend

- ABWP2 Array Area
- ABWP2 Cable Corridor and Working Area
- ABWP1 WTGs
- ABWP1 Existing Met Mast
- ABWP1 Existing Export Cable
- ABWP1 Array Area

Group 2 Fleeing Receptors - dBht_Level

- 186
- 203
- 210

Notes

Esri UK, Esri, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS, Esri, Intermap, NASA, NGA, USGS, Esri, CGIAR, USGS, Esri UK, Esri, TomTom, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS, Esri UK, Esri, TomTom, Garmin, FAO, NOAA, USGS, Esri UK, Esri, TomTom, Garmin, Foursquare, METI/NASA, USGS, Esri, GEBCO,

Coordinate System:
ETRS 1989 UTM Zone 30N

0 5 10 km

0 3 5 nm

Scale	Date	Drawn By	Checked By	Approved By
1:250,000 @ A3	05/04/2024	GB	EM	LK

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GoBe APEM Group

Figure Number 6.12

Figure Reference: Ark_012_14mMono_GroupTwoFleeingReceptorsOSPs_NIS_Fig6.12

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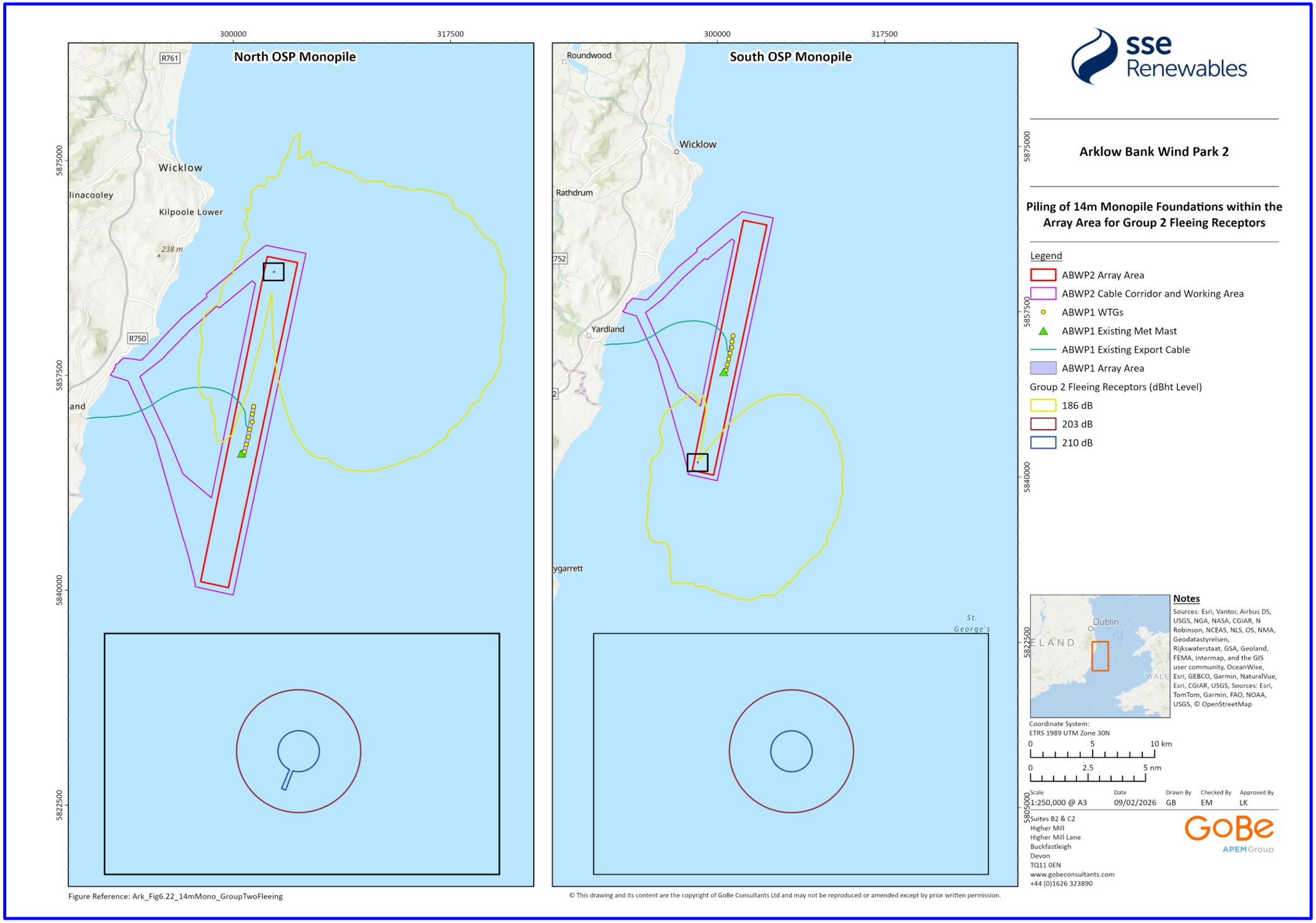
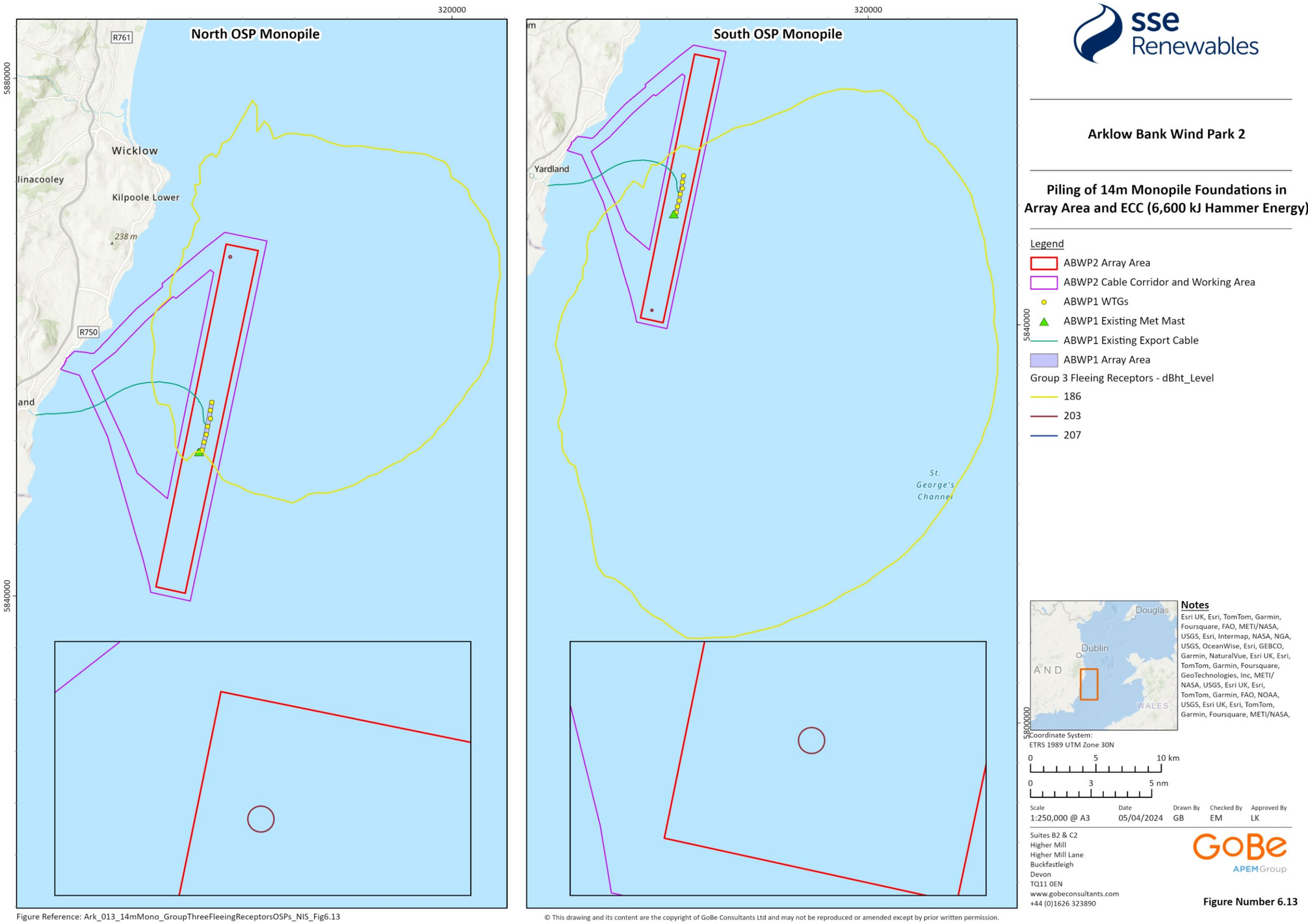


Figure 6.~~12~~22: Piling of 14 m Monopile Foundations within the Array Area for Group 2 fleeing receptors



sse Renewables

Arklow Bank Wind Park 2

Piling of 14m Monopile Foundations in Array Area and ECC (6,600 kJ Hammer Energy)

Legend

- ABWP2 Array Area
- ABWP2 Cable Corridor and Working Area
- ABWP1 WTGs
- ABWP1 Existing Met Mast
- ABWP1 Existing Export Cable
- ABWP1 Array Area

Group 3 Fleeing Receptors - dBht_Level

- 186
- 203
- 207

Notes

Esri UK, Esri, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS, Esri, Intermap, NASA, NGA, USGS, OceanWise, Esri, GEBCO, Garmin, NaturalVue, Esri UK, Esri, TomTom, Garmin, Foursquare, GeoTechnologies, Inc, METI/ NASA, USGS, Esri UK, Esri, TomTom, Garmin, FAO, NOAA, USGS, Esri UK, Esri, TomTom, Garmin, Foursquare, METI/NASA,

Coordinate System:
ETRS 1989 UTM Zone 30N

0 5 10 km

0 3 5 nm

Scale	Date	Drawn By	Checked By	Approved By
1:250,000 @ A3	05/04/2024	GB	EM	LK

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Figure Number 6.13

Figure Reference: Ark_013_14mMono_GroupThreeFleeingReceptorsOSPs_NIS_Fig6.13

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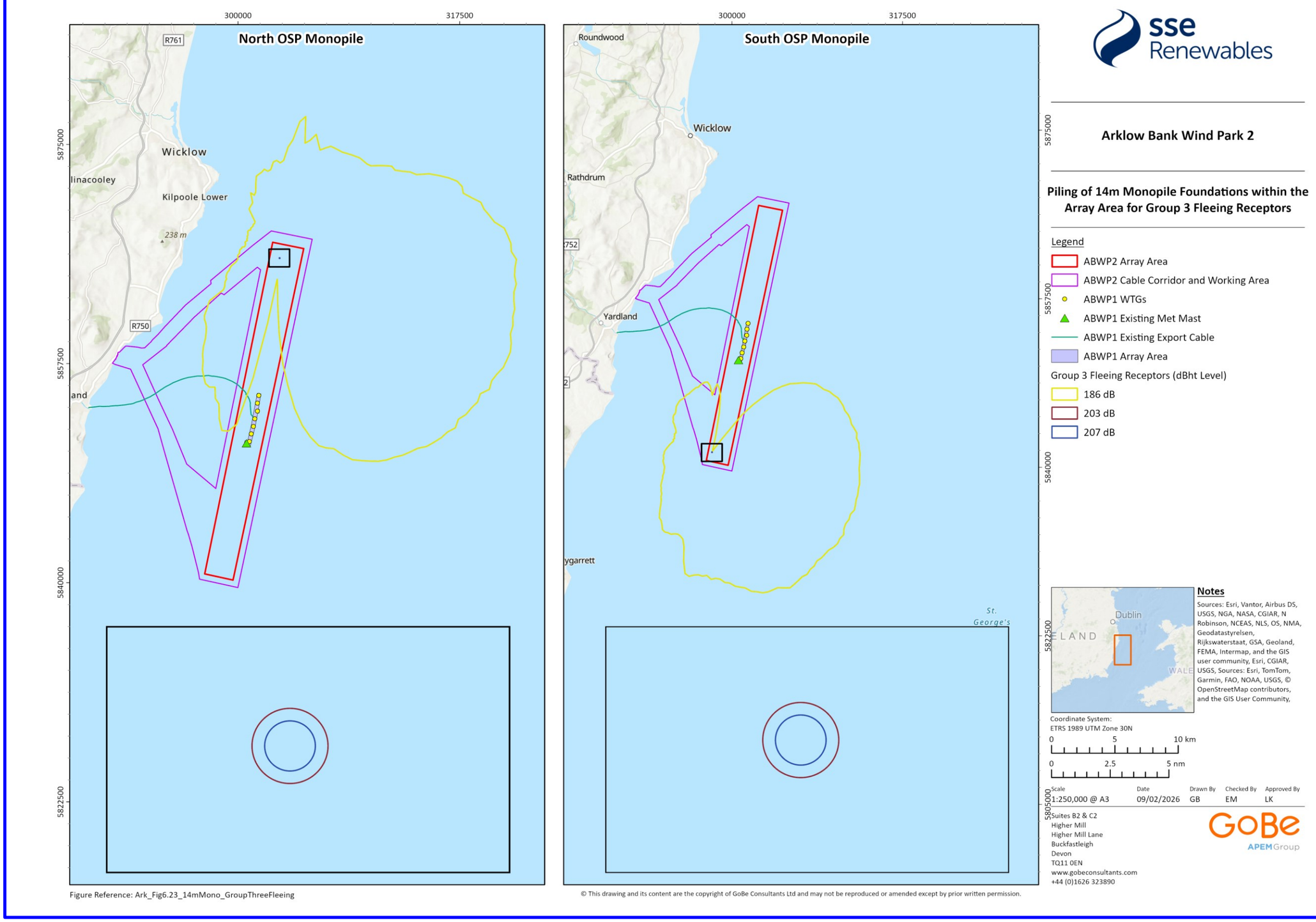


Figure 6.~~13~~23: Piling of 14 m Monopile Foundations within the Array Area for Group 3 fleeing receptors

INJURY AND/ OR DISTURBANCE FROM UNDERWATER NOISE – PILING ACTIVITIES (CONSTRUCTION)

6.6.1.19 ~~6.6.1.16~~ As twaite shad fall into the category of fish with a swim bladder which is involved in hearing they are the most susceptible to underwater noise impacts. For fish with a swim bladder which is involved in hearing (Type 3 fish), the >207 dB SPL_{peak} ~~thresholds~~threshold for mortality and potential mortal injury and recoverable injury ~~indicated in~~ Table 6.~~24~~38~~, modelling for the 11 m diametre monopiles indicates this threshold~~ may be exceeded up to ~~340~~330 m away from the sound source at the ~~SW site~~C WTG monopile, covering an area of up to ~~0.33~~0.31 km^2. At the other WTG foundation sites modelled, the maximum distance range was ~~310~~280-290 m (~~0.3~~0.22-0.25 km^2). For the two OSP foundation sites modelled~~ for the 14 m diametre monopiles~~, the maximum distance range was ~~310~~190-260 m (~~0.29~~0.1-0.21 km^2). This is the distance at which underwater noise and vibration may cause mortality or a recoverable injury to fish that have a swim bladder that is involved in hearing. It should be noted that the >207 dB SPL_{peak} threshold range is larger than the >207 dB SEL_{cum} threshold range, therefore the larger range of impact was used for this assessment.

6.6.1.20 ~~6.6.1.17~~ The >186 dB SEL_{cum} threshold for TTS was modelled to be exceeded up to ~~36 km~~28,000 m from the noise source ~~(maximum range)~~ at the ~~SW~~C WTG ~~site~~monopile, covering an area of up to ~~1,900~~1,000 km^2 for fleeing animals. At the ~~NW WTG site the model predicts that the TTS~~other locations, this threshold ~~could be~~for fleeing receptors was exceeded ~~up to 19 km~~between 16,000-25,000 m (350-890 km^2) from the noise source~~, covering an area of 440 km^2 for fleeing animals. At the S OSP site, the TTS threshold was exceeded up to 37 km from the noise source, covering an area of up to 1,800 km^2.~~.

6.6.1.21 ~~6.6.1.18~~ The Popper *et al.* (2014) criteria for fish with a swim bladder that is involved in hearing indicates that piling in likely to have a high effect on both masking and behaviour on fish within tens and hundreds of metres from the noise source and a Moderate effect beyond this.

6.6.1.22 ~~6.6.1.19~~ As the Slaney River Valley SAC is located ~~44.54~~47.55 km from the Proposed Development, the site is not within the threshold for mortality, recoverable injury or TTS (Figure 6.~~8~~18Figure 6.~~8~~18 through Figure 6.~~13~~23Figure 6.~~13~~23). However, individuals migrating past the Proposed Development may come into contact with these thresholds. As highly mobile fish species, twaite shad are expected to be able to avoid the noise sources before potential mortal injuries could occur and therefore effects are likely to be restricted to temporary TTS effects and temporary disruption/avoidance during migration.

6.6.1.23 ~~6.6.1.20~~ **It is concluded that there will be no AEoI on the twaite shad ~~feature~~QI of Slaney River Valley SAC as defined by the COs of the site as a result of underwater noise from piling activities as described above, from Project Design Option 1.**

6.6.1.24 ~~6.6.1.21~~ **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

INJURY AND/ OR DISTURBANCE FROM UNDERWATER NOISE – OTHER ACTIVITES (CONSTRUCTION, OPERATIONAL AND MAINTENANCE AND DECOMMISSIONING)

6.6.1.25 ~~6.6.1.22~~ The Popper *et al.* (2014) criteria for fish with a swim bladder that is not involved in hearing indicates for vessels and other continuous noise sources, mortality is likely to be Low at all distances as seen in Table 6.~~25~~39Table 6.~~25~~39.

6.6.1.26 ~~6.6.1.23~~ Moderate TTS effects may be observed within tens of metres and Low TTS effects beyond this distance. High effects on masking are likely within tens and hundreds of metres from the noise source with Moderate effects within thousands of metres. Moderate behavioural effects are likely within tens and hundreds of metres and Low behavioural effects are likely at thousands of metres.

6.6.1.27 ~~6.6.1.24~~ Recoverable injury has a numerical criterion of >170 dB SPL_{rms} for 48 hrs for continuous noise sources. Of the continuous noise sources for the Proposed Development, four have source noise levels below this criterion. There are four noise activities with a source noise level of more than >170 dB SPL_{rms}: cable laying; suction dredging; rock placement; and trenching. For these activities the modelling indicates the criterion may be exceeded up to 50 m away from the noise source if continuous for 48 hours or more.

6.6.1.28 ~~6.6.1.25~~ The TTS criterion for continuous noise sources is >158 dB SPL_{rms} for 12 hours. Modelling indicates the criterion may be exceeded up to 50 m away from the noise source if continuous for 12 hours or more.

6.6.1.29 ~~6.6.1.26~~ For continuous noise sources, it is likely there will be a High masking effect at all distances. For behavioural effects, Popper *et al.* (2014) suggests the effects are likely to be of High significance within tens of metres, Moderate within hundreds of metres and Low within thousands of metres.

6.6.1.30 ~~6.6.1.27~~ As the Slaney River Valley SAC is located ~~44.54~~47.55 km from the Proposed Development, the site is not within the threshold for mortality or recoverable injury or the threshold for TTS, and the magnitude of individuals at sea is considered to be low, it can be assumed that mortality and recoverable injury will not adversely affect the site.

6.6.1.31 ~~6.6.1.28~~ **It is concluded that there will be no AEoI on the twaite shad ~~feature~~QI of Slaney River Valley SAC as defined by the COs of the site as a result of underwater noise from other activities, as seen in Table 5.1 from Project Design Option 1.**

6.6.1.32 ~~6.6.1.29~~ **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

CHANGES IN EMF (OPERATIONAL AND MAINTENANCE)

6.6.1.33 ~~6.6.1.30~~ The conduction of electricity through subsea power cables has the potential to emit a localised EMF which could potentially affect the sensory mechanisms of some species of fish and shellfish, particularly electrosensitive species including migratory fish species.

6.6.1.34 ~~6.6.1.31~~ The presence and operation of inter-array, interconnector and offshore export cables within the Array Area and Cable Corridor and Working Area may lead to a localised EMF affecting fish and shellfish receptors. EMF comprises both the electrical I fields, measured in volts per metre (V/m), and the magnetic (B) fields, measured in microtesla (µT) or milligauss (mG) (1 µT = 10 mG). Direct E-field are typically blocked using conductive sheathing, meaning that the EMFs that are emitted into the marine environment are the B-field and the resultant induced electrical field (iE).

6.6.1.35 ~~6.6.1.32~~ The range over which these species can detect electric fields from offshore windfarm subsea cables is very localised and likely to be limited to metres, from the cable (CSA, 2019). EMFs may alter animal behaviour (e.g. via avoidance of EMF, increases in foraging behaviour, reductions in swimming speeds) but there is little evidence to suggest a reduction in survival. Pelagic species are considered unlikely to be exposed to EMF as they generally swim well above the seafloor and consequently would rarely be exposed even at low levels from subsea power cables (CSA, 2019). All QIs are therefore deemed to be of high tolerance and adaptability, high recoverability and of local to international importance. The sensitivity of all relevant fish species to temporary changes in electromagnetic fields is therefore, considered to be Low.

6.6.1.36 ~~6.6.1.33~~ While there is some change to EMFs in the vicinity of inter-array and offshore export cables, studies indicate that these are limited in extent, with the strength of EMF dissipating quickly with distance (within metres) from the buried cables. The impact therefore is predicted to be of near-field extent (i.e. restricted to within the Array Area and Cable Corridor and Working

Area), long term duration (i.e. the lifetime of the Proposed Development), continuous and of low consequence.

6.6.1.37 ~~6.6.1.34~~ **As the Slaney River Valley SAC is ~~44.54~~47.55 km from the Proposed Development and the EMF dissipates quickly within metres of the buried cables and the sensitivity of twaite shad is low to EMF, it is concluded that there is no AEoI on the twaite shad ~~feature~~QI of Slaney River Valley SAC as defined by the COs of the site as a result of EMF from Project Design Option 1.**

6.6.1.38 ~~6.6.1.35~~ **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

ACCIDENTAL POLLUTION (CONSTRUCTION, OPERATIONAL AND MAINTENANCE AND DECOMMISSIONING)

6.6.1.39 Accidental release of pollutants (such as fuel, lubricants, and anti-fouling biocides) from vessels or equipment associated with the Proposed Development has the potential to occur during the construction, operational and maintenance and decommissioning phases as a result of the installation/removal of foundations, presence of operational equipment, maintenance activities, and the installation of inter-array cables, interconnector cables and offshore export cables.

6.6.1.40 Considering avoidance through design and management (Table 6.~~22~~36), the likelihood of accidental release is considered extremely low. The measures in the EMP include storage of chemicals in secure designated areas on vessels in line with appropriate regulations and guidelines, and double skinning of any tanks and pipes containing hazardous substances. All chemicals used will be subject to a chemical risk assessment to ensure risks are understood and minimised. The EMP also includes a MPCP which will contain key emergency contact details and response procedures in the event of a spill of any magnitude to ensure minimal impact. Complying with these procedures will also reduce the magnitude of any spill. Adherence to the avoidance design and management measures outlined in Table 6.7, including the EMP and MPCP will significantly reduce the likelihood of an accidental pollution incident occurring, and the magnitude of its impact.

6.6.1.41 **Given the low likelihood of accidental pollution, as well as the proposed avoidance/ impact reduction measures it is concluded that there is no AEoI on the twaite shad QI of Slaney River Valley SAC as defined by the COs of the site as a result of accidental pollution from Project Design Option 1.**

6.6.1.42 **Based on the representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

Atlantic salmon

6.6.1.43 ~~6.6.1.36~~ The ~~conservation objectives~~COs for Atlantic salmon at this designated site is to restore the favourable conservation condition of the ~~feature~~QI, this is defined and presented in Table 5.1.

6.6.1.44 ~~6.6.1.37~~ There are ~~three key~~four potential ~~impacts on~~impact pathways considered for Atlantic salmon associated with construction, operational and maintenance, and decommissioning of the Proposed Development, which are presented in Table 6.~~23~~37Table 6.~~23~~37 and are assessed below for each phase of the Proposed Development.

INJURY AND/ OR DISTURBANCE FROM UNDERWATER NOISE – PILING ACTIVITIES (CONSTRUCTION)

6.6.1.45 ~~6.6.1.38~~ Atlantic salmon fall into the category of fish that have a swim bladder, but it is not involved in hearing.

6.6.1.46 For ~~the >207 dB SPL_{peak} thresholds indicated in **Error! Unknown switch argument.**, modelling for the 11 m diametre monopiles indicates this threshold~~fish with a swim bladder which is not involved in hearing, the >207 dB peak threshold for mortality and potential mortal injury and recoverable injury may be exceeded up to ~~340~~330 m away from the sound source at the ~~SW site~~C WTG monopile, covering an area of up to ~~0.33~~0.31 km^2. At the other WTG foundation sites modelled, the maximum distance range was ~~310~~280-290 m (~~0.3~~0.22-0.25 km^2). For the two OSP foundation sites modelled, the maximum distance range was ~~310 m (0.3~~190-260m (0.1-0.21 km^2) ~~for the 7 m and 14 m diametre foundations~~. This is the distance at which underwater noise and vibration may cause mortality or a recoverable injury to fish that have a swim bladder that is not involved in hearing. It should be noted that the >207 dB SPL_{peak} threshold range is larger than the >207 dB SEL_{cum} threshold range, therefore the larger range of impact was used for this assessment.

~~6.6.1.39 The >210 dB SEL_{cum} threshold for mortality criteria was modelled to be exceeded less than 100 m from the noise source for all WTG foundation and OSP foundation locations for fleeing animals.~~

~~6.6.1.40 The >203 dB SEL_{cum} threshold for recoverable injury criteria was modelled to be exceeded less than 100 m from the noise source for all WTG foundation and OSP foundation locations for fleeing animals.~~

6.6.1.47 ~~6.6.1.41~~ The >186 dB SEL_{cum} threshold for TTS was modelled to be exceeded up to ~~36 km~~28,000 m from the noise source ~~(maximum range)~~ at the ~~SW~~C WTG ~~site~~monopile, covering an area of up to ~~1,900~~1,000 km^2 for fleeing animals. At the ~~NW WTG site the model predicts that the TTS~~other locations, this threshold ~~could be~~for fleeing receptors was exceeded ~~up to 19 km~~between 16,000-25,000 m (350-890 km^2) from the noise source~~, covering an area of 440 km^2 for fleeing animals. At the S OSP site the model predicts that the TTS threshold could be exceeded up to 35 km from the noise source, covering an area of 1,800 km^2 for fleeing animals.~~.

6.6.1.48 ~~6.6.1.42~~ The Popper *et al.* (2014) criteria for fish with a swim bladder that is not involved in hearing indicates that piling in likely to have a Moderate effect on masking for fish within tens of metres from the noise source and a Low effect beyond this. Behavioural effects are likely to be High within tens of metres, Moderate within hundreds of metres and Low at greater distances.

6.6.1.49 ~~6.6.1.43~~ As the Slaney River Valley SAC is located ~~44.54~~47.55 km from the proposed development, the site is not within the threshold for mortality, recoverable injury or TTS. Migration patterns of Atlantic salmon out of this SAC are not fully understood. However, they are assumed to migrate northerly past the Proposed Development, similar to the migration patterns observed for Atlantic salmon along other East Ireland rivers (Barry *et al.*, 2020). As highly mobile fish species, Atlantic salmon are expected to be able to avoid the noise sources before potential mortal injuries could occur and therefore effects are likely to be restricted to temporary TTS effects and temporary disruption/avoidance during migration.

6.6.1.50 ~~6.6.1.44~~ **It is concluded that there will be no AEoI on the Atlantic salmon ~~feature~~QI of Slaney River Valley SAC as defined by the COs of the site as a result of underwater noise from piling activities, as seen in Table 5.1 from Project Design Option 1.**

6.6.1.51 ~~6.6.1.45~~ **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

INJURY AND/ OR DISTURBANCE FROM UNDERWATER NOISE – OTHER ACTIVITES (CONSTRUCTION, OPERATIONAL AND MAINTENANCE AND DECOMMISSIONING)

6.6.1.52 ~~6.6.1.46~~ The Popper *et al.* (2014) criteria for fish with a swim bladder that is not involved in hearing indicates for vessels and other continuous noise sources, mortality is likely to be Low at all distances as seen in Table 6.~~25~~39Table 6.~~25~~39.

6.6.1.53 ~~6.6.1.47~~ The Popper *et al.* (2014) criteria for fish with a swim bladder that is not involved in hearing indicates for vessels and other continuous noise sources, mortality and recoverable injuries are likely to be Low at all distances. Moderate TTS effects may be observed within tens of metres and Low beyond this distance. High effects on masking are likely within tens and hundreds of metres from the noise source with Moderate effects within thousands of metres. Moderate behavioural effects are likely within tens and hundreds of metres and Low behavioural effects are likely at thousands of metres.

6.6.1.54 ~~6.6.1.48~~ The results of modelling of UXO clearance indicates that if the maximum charge (800 kg + donor) was detonated it could result in mortality or mortal injury in 560-930 m from the explosion. If Low-order deflagration (charge weight of 0.5 kg) is used to initiate a burnout of the explosive any fish within 80 m of the explosion would be at risk of mortality or mortal injury. Low-order deflagration is not always possible and if the original charge is not fully detonated then a High-order detonation would be required to remove the remaining charge. If High-order detonation is required of an 800 kg UXO it has the potential to kill Type 1 fish occurring in the area. Recoverable injury, TTS and behavioural effects are also likely within tens of metres of the noise source and may be observed within hundreds of metres.

6.6.1.55 ~~6.6.1.49~~ As the Slaney River Valley SAC is located ~~44.54~~47.55 km from the proposed development, the site is not within the threshold for mortality or recoverable injury or the threshold for TTS, and the magnitude of individuals at sea is considered to be low, it can be assumed that mortality and recoverable injury will not have an adversely effect on the site.

6.6.1.56 ~~6.6.1.50~~ **It is concluded that there will be no AEoI on the Atlantic salmon ~~feature~~QI of Slaney River Valley SAC as defined by the COs of the site as a result of underwater noise from other activities, as seen in Table 5.1 from Project Design Option 1.**

6.6.1.57 ~~6.6.1.51~~ **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

CHANGES IN EMF (OPERATIONAL AND MAINTENANCE)

6.6.1.58 ~~6.6.1.52~~ The conduction of electricity through subsea power cables has the potential to emit a localised EMF which could potentially affect the sensory mechanisms of some species of fish and shellfish, particularly electrosensitive species including migratory fish species.

6.6.1.59 ~~6.6.1.53~~ The presence and operation of inter-array, interconnector and offshore export cables within the Array Area and Cable Corridor and Working Area may lead to a localised EMF affecting fish and shellfish receptors. EMF comprises both the electrical (E) fields, measured in volts per metre (V/m), and the magnetic (B) fields, measured in microtesla (µT) or milligauss (mG) (1 µT = 10 mG). Direct E-field are typically blocked using conductive sheathing, meaning that the EMFs that are emitted into the marine environment are the B-field and the resultant induced electrical field (iE).

6.6.1.60 ~~6.6.1.54~~ The range over which these species can detect ~~electric fields~~EMFs from offshore windfarm subsea cables is very localised and likely to be limited to metres, from the cable (CSA, 2019). EMFs may alter animal behaviour (e.g. via avoidance of EMF, increases in foraging behaviour, reductions in swimming speeds) but there is little evidence to suggest a reduction in survival. Pelagic species are considered unlikely to be exposed to EMF as they generally swim well above the seafloor and consequently would rarely be exposed even at low levels from subsea power cables (CSA, 2019). All IEFs are therefore deemed to be of high tolerance and adaptability, high recoverability and of local to international importance. The sensitivity of all relevant fish species to temporary changes in electromagnetic fields is therefore, considered to be Low.

6.6.1.61 ~~6.6.1.55~~ While there is some change to EMFs in the vicinity of inter-array and offshore export cables, studies indicate that these are limited in extent, with the strength of EMF dissipating quickly with distance (within metres) from the buried cables.

6.6.1.62 ~~6.6.1.56~~ **As the Slaney River Valley SAC is ~~44.54~~47.55 km from the Proposed Development and the EMF dissipates quickly within metres of the buried cables and the sensitivity of Atlantic salmon is low to EMF, it is concluded that there is no AEoI on the Atlantic salmon ~~feature~~QI of Slaney River Valley SAC as defined by the COs of the site as a result of EMF from Project Design Option 1.**

6.6.1.63 ~~6.6.1.57~~ **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

ACCIDENTAL POLLUTION (CONSTRUCTION, OPERATIONAL AND MAINTENANCE AND DECOMMISSIONING)

6.6.1.64 Accidental release of pollutants (such as fuel, lubricants, and anti-fouling biocides) from vessels or equipment associated with the Proposed Development has the potential to occur during the construction, operational and maintenance and decommissioning phases as a result of the installation/removal of foundations, presence of operational equipment, maintenance activities, and the installation of inter-array cables, interconnector cables and offshore export cables.

6.6.1.65 Considering avoidance through design and management (Table 6.~~22~~36), the likelihood of accidental release is considered extremely low. The measures in the EMP include storage of chemicals in secure designated areas on vessels in line with appropriate regulations and guidelines, and double skinning of any tanks and pipes containing hazardous substances. All chemicals used will be subject to a chemical risk assessment to ensure risks are understood and minimised. The EMP also includes a MPCP which will contain key emergency contact details and response procedures in the event of a spill of any magnitude to ensure minimal impact. Complying with these procedures will also reduce the magnitude of any spill. Adherence to the avoidance design and management measures outlined in Table 6.~~22~~36, including the EMP and MPCP will significantly reduce the likelihood of an accidental pollution incident occurring, and the magnitude of its impact.

6.6.1.66 **Given the low likelihood of accidental pollution, as well as the proposed avoidance/ impact reduction measures it is concluded that there is no AEoI on the Atlantic salmon QI of Slaney River Valley SAC as defined by the COs of the site as a result of accidental pollution from Project Design Option 1.**

6.6.1.67 **Based on the representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

Sea lamprey and River lamprey

6.6.1.68 ~~6.6.1.58~~ The ~~conservation objectives~~COs for sea lamprey and river lamprey at this designated site is to restore the favourable conservation condition of the ~~feature~~QI, this is defined and presented in Table 5.1.

6.6.1.69 ~~6.6.1.59~~ There are ~~three~~four key potential ~~impacts on~~impact pathways considered for sea lamprey and river lamprey associated with construction, operational and maintenance, and decommissioning of the Proposed Development, which are presented in Table 6.~~23~~37Table 6.~~23~~37 and are assessed below for each phase of the Proposed Development.

INJURY AND/ OR DISTURBANCE FROM UNDERWATER NOISE – PILING ACTIVITIES (CONSTRUCTION)

6.6.1.70 ~~6.6.1.60~~ Sea lamprey and River lamprey fall into the category of fish with no swim bladder. For fish with no swim bladder, the >213 dB ~~SPL_{peak} thresholds~~peak threshold for mortality and potential mortal injury and recoverable injury ~~criteria as indicated in **Error! Unknown switch argument.**, the modelling for the 11 m diametre monopiles indicates this threshold~~, may be exceeded up to ~~130~~140 m away from the ~~sound~~noise source at the ~~SW site~~C WTG monopile,

covering an area of up to ~~0.05~~0.06 km^2. At the other WTG foundation sites modelled (SW WTG and N WTG), the maximum distance ~~range~~ was ~~90-120~~120 m (~~0.03-0.04~~0.04-0.05 km^2). For the two OSP foundation sites modelled, the maximum distance range was ~~110-120~~80-110 m (~~0.03-0.04~~0.02-0.04 km^2)~~for both the 7 m and 14 m monopiles~~. This is the distance at which underwater noise and vibration may cause mortality or a recoverable injury to fish ~~with no~~that have a swim bladder~~.~~

~~6.6.1.61~~ that is not involved in hearing. It should be noted that the >~~219~~207 dB SPL$_{peak}$ threshold range is larger than the >207 dB SEL$_{cum}$ threshold ~~for mortality and recoverable injury criteria was modelled to be exceeded less than 100 m from the noise source for all WTG foundation and OSP foundation locations for fleeing animals.~~range, therefore the larger range of impact was used for this assessment.

6.6.1.1 ~~6.6.1.62~~ The >186 dB SEL$_{cum}$ threshold for TTS was modelled to be exceeded up to ~~36 km~~28,000 m from the noise source ~~(maximum range)~~ at the ~~SW~~C WTG site, covering an area of up to ~~1,900~~1,000 km^2 for fleeing animals. At the ~~NW WTG site the model predicts that the TTS~~other locations, this threshold ~~could be~~for fleeing receptors was exceeded ~~up to 19 km~~between 16,000-25,000 m (350-890 km^2) from the noise source~~, covering an area of 440 km^2 for fleeing animals. At the S OSP site the model predicted the TTS threshold could be exceeded up to 35 km from the noise source, covering an area of up to 1,800 km^2 for both the 7 m and 14 m diametre foundations.~~.

6.6.1.2 ~~6.6.1.63~~ The Popper *et al.* (2014) criteria for fish with no swim bladder indicates that piling in likely to have a Moderate effect on masking for fish within tens of metres from the noise source and a Low effect beyond this. Behavioural effects are likely to be High within tens of metres, Moderate within hundreds of metres and Low at greater distances.

6.6.1.3 ~~6.6.1.64~~ As the Slaney River Valley SAC is located ~~44.54~~47.55 km from the proposed development, the site is not within the threshold for mortality or recoverable injury or the threshold for TTS (Figure 6.~~8~~18 ~~through~~ Figure 6.~~13~~23Figure 6.~~13~~23), and the magnitude of individuals at sea is considered to be low, it can be assumed that mortality and recoverable injury will not have an adverse effect on the site.

6.6.1.4 ~~6.6.1.65~~ **It is concluded that there will be no AEoI on the sea lamprey and river lamprey ~~feature~~QIs of the Slaney River Valley SAC as defined by the COs of the site as a result of underwater noise from other activities, as seen in Table 5.1 from Project Design Option 1.**

6.6.1.5 ~~6.6.1.66~~ **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

INJURY AND/ OR DISTURBANCE FROM UNDERWATER NOISE – OTHER ACTIVITES (CONSTRUCTION, OPERATIONAL AND MAINTENANCE AND DECOMMISSIONING)

6.6.1.6 ~~6.6.1.67~~ The Popper *et al.* (2014) criteria for fish with no swim bladder indicates for vessels and other continuous noise sources, mortality and recoverable injuries are likely to be Low at all distances. Moderate TTS effects may be observed within tens of metres and Low beyond this distance. High effects on masking are likely within tens and hundreds of metres from the noise source with Moderate effects within thousands of metres. Moderate behavioural effects are likely within tens and hundreds of metres and Low behavioural effects are likely at thousands of metres as seen in Table 6.~~25~~39Table 6.~~25~~39.

6.6.1.7 ~~6.6.1.68~~ As the Slaney River Valley SAC is located ~~44.54~~47.55 km from the proposed development, the site is not within the threshold for mortality or recoverable injury or the threshold for TTS, and the magnitude of individuals at sea is considered to be low, it can be assumed that mortality and recoverable injury will not have an adverse effect on the site.

6.6.1.8 ~~6.6.1.69~~ **It is concluded that there will be no AEoI on the sea lamprey and river lamprey ~~feature~~QIs of Slaney River Valley SAC as defined by the COs of the site as a result of underwater noise from other activities, as seen in Table 5.1 from Project Design Option 1.**

6.6.1.9 ~~6.6.1.70~~ **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

CHANGES IN EMF (OPERATIONAL AND MAINTENANCE)

6.6.1.10 ~~6.6.1.71~~ The conduction of electricity through subsea power cables has the potential to emit a localised EMF which could potentially affect the sensory mechanisms of some species of fish and shellfish, particularly electrosensitive species including migratory fish species.

6.6.1.11 ~~6.6.1.72~~ The presence and operation of inter-array, interconnector and offshore export cables within the Array Area and Cable Corridor and Working Area may lead to a localised EMF affecting fish and shellfish receptors. EMF comprises both the electrical (E) fields, measured in volts per metre (V/m), and the magnetic (B) fields, measured in microtesla (μT) or milligauss (mG) (1 μT = 10 mG). Direct E-field are typically blocked using conductive sheathing, meaning that the EMFs that are emitted into the marine environment are the B-field and the resultant induced electrical field (iE).

6.6.1.12 ~~6.6.1.73~~ The range over which these species can detect electric fields from offshore windfarm subsea cables is very localised and likely to be limited to metres, from the cable (CSA, 2019). ~~EMFs~~EMF may alter animal behaviour (e.g. via avoidance of EMF, increases in foraging behaviour, reductions in swimming speeds) but there is little evidence to suggest a reduction in survival. Pelagic species are considered unlikely to be exposed to EMF as they generally swim well above the seafloor and consequently would rarely be exposed even at low levels from subsea power cables (CSA, 2019). All IEFs are therefore deemed to be of high tolerance and adaptability, high recoverability and of local to international importance. The sensitivity of all relevant fish species to temporary changes in electromagnetic fields is therefore, considered to be Low.

6.6.1.13 ~~6.6.1.74~~ While there is some change to EMFs in the vicinity of inter-array and offshore export cables, studies indicate that these are limited in extent, with the strength of EMF dissipating quickly with distance (within metres) from the buried cables.

6.6.1.14 ~~6.6.1.75~~ **As the Slaney River Valley SAC is ~~44.54~~47.55 km from the Proposed Development and the EMF dissipates quickly within metres of the buried cables and the sensitivity of sea lamprey and river lamprey is low to EMF, it is concluded that there is no AEoI on the sea lamprey and river lamprey ~~feature~~QIs of Slaney River Valley SAC as defined by the COs of the site as a result of EMF from Project Design Option 1.**

6.6.1.15 ~~6.6.1.76~~ **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

ACCIDENTAL POLLUTION (CONSTRUCTION, OPERATIONAL AND MAINTENANCE AND DECOMMISSIONING)

6.6.1.16 Accidental release of pollutants (such as fuel, lubricants, and anti-fouling biocides) from vessels or equipment associated with the Proposed Development has the potential to occur during the construction, operational and maintenance and decommissioning phases as a result of the installation/removal of foundations, presence of operational equipment, maintenance activities, and the installation of inter-array cables, interconnector cables and offshore export cables.

6.6.1.17 Considering avoidance through design and management (Table 6.~~22~~36), the likelihood of accidental release is considered extremely low. The measures in the EMP include storage of chemicals in secure designated areas on vessels in line with appropriate regulations and guidelines, and double skinning of any tanks and pipes containing hazardous substances. All

chemicals used will be subject to a chemical risk assessment to ensure risks are understood and minimised. The EMP also includes a MPCP which will contain key emergency contact details and response procedures in the event of a spill of any magnitude to ensure minimal impact. Complying with these procedures will also reduce the magnitude of any spill. Adherence to the avoidance design and management measures outlined in Table 6.~~22~~36, including the EMP and MPCP will significantly reduce the likelihood of an accidental pollution incident occurring, and the magnitude of its impact.

6.6.1.18 **Given the low likelihood of accidental pollution, as well as the proposed avoidance/ impact reduction measures it is concluded that there is no AEoI on the sea lamprey and river lamprey QIs of Slaney River Valley SAC as defined by the COs of the site as a result of accidental pollution from Project Design Option 1.**

6.6.1.19 **Based on the irepresentative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

Freshwater pearl mussels

6.6.1.20 ~~6.6.1.77~~ The ~~conservation objectives~~COs for freshwater pearl mussels at this designated site is to restore the favourable conservation condition of the ~~feature~~QI, this is defined and presented in Table 5.1.

6.6.1.21 ~~6.6.1.78~~ There are ~~three key~~four potential ~~impacts on~~impact pathways considered for freshwater pearl mussels (via obligate host species) associated with construction, operational and maintenance, and decommissioning of the Proposed Development, which are presented in Table 6.~~23~~37Table 6.~~23~~37 and are assessed below.

6.6.1.22 ~~6.6.1.79~~ Freshwater pearl mussels ~~is~~are of consideration at this site as within the first year of their life cycle, they live on the gills of either young Atlantic salmon or Brown trout (Moorkens, 1999). As the viability of the mussel population is inherently linked to the viability of the salmon population, it is considered that the maximum potential effect from the Proposed Development on freshwater pearl mussel will be the same as that considered for Atlantic salmon, and the conclusions made to the salmon population will mirror those for freshwater pearl mussel.

6.6.1.23 ~~6.6.1.80~~ **As it was concluded that there would be no AEoI for Atlantic salmon from all potential impacts, the same is concluded for freshwater pearl mussels and therefore there is no AEoI on the freshwater pearl mussel ~~feature~~QI of the Slaney River Valley SAC as defined by the COs of the site as a result of all potential impacts from Project Design Option 1.**

6.6.1.24 ~~6.6.1.81~~ **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

6.6.2 River Barrow and River Nore SAC

Twaite Shad

6.6.2.1 The ~~conservation objectives~~COs for twaite shad at this designated site is to restore the favourable conservation condition of the ~~feature~~QI, this is defined and presented in Table 5.1.

6.6.2.2 There are ~~two key~~four potential ~~impacts on~~impact pathways considered for twaite shad associated with construction, operational and maintenance, and decommissioning of the Proposed Development, which are presented in Table 6.~~23~~37Table 6.~~23~~37 and are assessed below for each phase of the Proposed Development. These comprise of injury and/ or disturbance from underwater noise caused by piling ~~and~~activities, injury and/ or disturbance from underwater noise caused by other construction activities, ~~and~~ changes in EMF and accidental pollution.

6.6.2.3 With consideration that the ~~impact severity~~magnitude of potential impacts is based on distance from the site of works, Slaney River Valley SAC (~~44.54~~47.55 km) is designated for the same QIs

as River Barrow and River Nore SAC (~~109.6~~125.42 km) and is located nearer to the Proposed Development. On this basis, it was concluded that the potential for AEoI for Annex II Fish and Shellfish QIs is the same or reduced for ~~this site~~River Barrow and River Nore SAC as it is for Slaney River Valley SAC. In Section 6.6.1 it has been concluded that none of the potential effects on twaite shad would result in an AEoI of the Annex II Fish and Shellfish QIs of the Slaney River Valley SAC.

6.6.2.4 **Therefore, there is no AEoI on the twaite shad ~~feature~~QI of the River Barrow and River Nore SAC as defined by the COs of the site as a result of any of the impacts considered above from Project Design Option 1.**

6.6.2.5 **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

Atlantic salmon

6.6.2.6 The ~~conservation objectives~~COs for Atlantic salmon at this designated site is to restore the favourable conservation condition of the ~~feature~~QI, this is defined and presented in Table 5.1.

6.6.2.7 There are ~~two key~~four potential ~~impacts on~~impact pathways considered for Atlantic salmon associated with construction, operational and maintenance, and decommissioning of the Proposed Development, which are presented in Table 6.~~23~~37Table 6.~~23~~37 and are assessed below for each phase of the Proposed Development. These comprise injury and/ or disturbance from underwater noise caused by piling ~~and~~activities, injury and/or disturbance from underwater noise caused by other construction activities, ~~and~~ changes in EMF and accidental pollution.

6.6.2.8 With consideration that the impact severity is based on distance from the site of works, Slaney River Valley SAC (~~44.54~~47.55 km) is designated for the same QIs as River Barrow and River Nore SAC (~~109.6~~125.42 km) and is located nearer to the Proposed Development~~.~~. On this basis it was concluded that the potential for AEoI for Annex II Fish and Shellfish QIs is the same or reduced for ~~this site~~River Barrow and River Nore SAC as it is for Slaney River Valley SAC. In Section 6.6.1, it has been concluded that none of the potential effects on Atlantic salmon would result in an AEoI of the Annex II Fish and Shellfish QIs of the Slaney River Valley SAC.

6.6.2.9 **Therefore, there is no AEoI on the Atlantic salmon ~~feature~~QI of the River Barrow and River Nore SAC, as defined by the COs of the site, as a result of any of the impacts considered above from Project Design Option 1.**

6.6.2.10 **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

Sea lamprey and River lamprey

6.6.2.11 The ~~conservation objectives~~COs for sea lamprey and river lamprey at this designated site is to restore the favourable conservation condition of the ~~feature~~QI, this is defined and presented in Table 5.1.

6.6.2.12 There are ~~two key~~four potential ~~impacts on~~impact pathways considered for sea lamprey and river lamprey associated with construction, operational and maintenance, and decommissioning of the Proposed Development, which are presented in Table 6.~~23~~37Table 6.~~23~~37 and are assessed below for each phase of the Proposed Development. These comprise injury and/ or disturbance from underwater noise caused by piling ~~and~~activities, injury and/or disturbance from underwater noise caused by other construction activities, ~~and~~ changes in EMF and accidental pollution.

6.6.2.13 With consideration that the impact severity is based on distance from the site of works, Slaney River Valley SAC (~~44.54~~47.55 km) is designated for the same QIs as River Barrow and River Nore SAC (~~109.6~~125.42 km) and is located nearer to the Proposed Development. On this basis, it was concluded that the potential for AEoI on the QIs of Annex II Fish and Shellfish is the same or reduced for ~~this site~~River Barrow and River Nore SAC as it is for Slaney River Valley SAC. In

Section 6.6.1 it has been concluded that none of the potential effects on sea lamprey and river lamprey would result in an AEoI of the Annex II Fish and Shellfish QIs of the Slaney River Valley SAC.

6.6.2.14 **Therefore, there is no AEoI on the sea lamprey and river lamprey ~~feature~~QIs of the River Barrow and River Nore SAC, as defined by the COs of the site, as a result of any of the impacts considered above affecting from Project Design Option 1.**

6.6.2.15 **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

Freshwater pearl mussels

6.6.2.16 The ~~conservation objectives~~COs for freshwater pearl mussels at this designated site is to restore the favourable conservation condition of the ~~feature~~QI, this is defined and presented in Table 5.1.

6.6.2.17 There are ~~two key~~four potential ~~impacts on~~impact pathways considered for freshwater pearl mussels (via obligate host species) associated with construction, operational and maintenance, and decommissioning of the Proposed Development, which are presented in Table 6.~~23~~37Table 6.~~23~~37 and are assessed below for each phase of the Proposed Development. These comprise of injury and/ or disturbance from underwater noise caused by piling ~~and~~activities, injury and/or disturbance from underwater noise caused by other construction activities, ~~and~~ changes in EMF and accidental pollution.

6.6.2.18 With consideration that the impact severity is based on distance from the site of works, Slaney River Valley SAC (~~44.54~~47.55 km) is designated for the same QIs as River Barrow and River Nore SAC (~~109.6km~~125.42 km) and is located nearer to the Proposed Development. On this basis, it was concluded that the potential for AEoI on Annex II Fish and Shellfish QIs is the same or reduced for ~~this site~~River Barrow and River Nore SAC as it is for Slaney River Valley SAC. In Section ~~6.6.1.23~~6.6.1.23 it has been concluded that none of the potential effects on freshwater pearl mussels would result in an AEoI of the Annex II Fish and Shellfish QIs of the Slaney River Valley SAC.

6.6.2.19 **Therefore, there is no AEoI on the freshwater pearl mussel ~~feature~~QI of the River Barrow and River Nore SAC, as defined by the COs of the site, as a result of any of the impacts considered above affecting from Project Design Option 1.**

6.6.2.20 **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

6.6.3 Lower River Suir SAC

Twaite Shad

6.6.3.1 The ~~conservation objectives~~COs for twaite shad at this designated site is to restore the favourable conservation condition of the ~~feature~~QI, this is defined and presented in Table 5.1.

6.6.3.2 There are ~~two key~~four potential ~~impacts on~~impact pathways considered for twaite shad associated with construction, operational and maintenance, and decommissioning of the Proposed Development, which are presented in ~~**Error! Unknown switch argument.**~~Table 6.2337 and are assessed below for each phase of the Proposed Development. These comprise injury and/ or disturbance from underwater noise caused by piling ~~and~~activities, injury and/or disturbance from underwater noise caused by other construction activities, ~~and~~ changes in EMF and accidental pollution.

6.6.3.3 With consideration that the impact severity is based on distance from the site of works, Slaney River Valley SAC (~~44.54~~47.55 km) is designated for the same QIs as Lower River Suir SAC (~~126.51~~192.63 km) and is located nearer to the Proposed Development. On this basis, it was concluded that the potential for AEoI on the Annex II Fish and Shellfish QIs is the same or reduced

for this ~~site~~Lower River Suir SAC as it is for Slaney River Valley SAC. In Section 6.6.1 it has been concluded that none of the potential effects on twaite shad would result in an AEoI of the Fish and Shellfish QIs of the Slaney River Valley SAC.

6.6.3.4 **Therefore, there is no AEoI on the twaite shad ~~feature~~QI of the Lower River Suir SAC, as defined by the COs of the site, as a result of any of the impacts considered above affecting from Project Design Option 1.**

6.6.3.5 **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

Atlantic salmon

6.6.3.6 The ~~conservation objectives~~COs for Atlantic salmon at this designated site is to restore the favourable conservation condition of the ~~feature~~QI, this is defined and presented in Table 5.1.

6.6.3.7 There are ~~two key~~four potential ~~impacts on~~impact pathways considered for Atlantic salmon associated with construction, operational and maintenance, and decommissioning of the Proposed Development, which are presented in Table 6.~~23~~37Table 6.~~23~~37 and are assessed below for each phase of the Proposed Development. These comprise injury and/ or disturbance from underwater noise caused by piling ~~and~~activities, injury and/or disturbance from underwater noise caused by other construction activities, ~~and~~ changes in EMF and accidental pollution.

6.6.3.8 With consideration that the impact severity is based on distance from the site of works, Slaney River Valley SAC (~~44.54~~47.55 km) is designated for the same QIs as Lower River Suir SAC (~~126.51~~192.63 km) and is located nearer to the Proposed Development. On this basis, it was concluded that the potential for AEoI on the Annex II Fish and Shellfish QIs is the same or reduced for ~~this site~~Lower River Suir SAC as it is for Slaney River Valley SAC. In Section 6.6.1, it has been concluded that none of the potential effects on Atlantic salmon would result in an AEoI of the Annex II Fish and Shellfish QIs of the Slaney River Valley SAC.

6.6.3.9 **Therefore, there is no AEoI on the Atlantic salmon ~~feature~~QI of the Lower River Suir SAC, as defined by the COs of the site, as a result of any of the impacts considered above affecting from Project Design Option 1.**

6.6.3.10 **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

Sea lamprey and River lamprey

6.6.3.11 The ~~conservation objectives~~COs for sea lamprey at this designated site is to restore the favourable conservation condition of the ~~feature~~QI, this is defined and presented in Table 5.1.

6.6.3.12 There are ~~two key~~four potential ~~impacts~~impact pathways on sea lamprey associated with construction, operational and maintenance, and decommissioning of the Proposed Development, which are presented in ~~**Error! Unknown switch argument.**~~Table 6.2337 and are assessed below for each phase of the Proposed Development. These comprise injury and/ or disturbance from underwater noise caused by piling ~~and~~activities, injury and/or disturbance from underwater noise caused by other construction activities, ~~and~~ changes in EMF and accidental pollution.

6.6.3.13 With consideration that the impact severity is based on distance from the site of works, Slaney River Valley SAC (~~44.54~~47.55 km) is designated for the same QIs as Lower River Suir SAC (~~126.51~~192.63 km) and is located nearer to the Proposed Development. On this basis, it was concluded that the potential for AEoI on Annex II Fish and Shellfish is the same or reduced for ~~this site~~Lower River Suir SAC as it is for Slaney River Valley SAC. In Section 6.6.1 it has been concluded that none of the potential effects on sea lamprey would result in an AEoI of the QIs for Annex II Fish and Shellfish for the Slaney River Valley SAC.

6.6.3.14 **Therefore, there is no AEoI on the sea lamprey and river lamprey ~~feature~~QIs of the Lower River Suir SAC, as defined by the COs of the site, as a result of any of the impacts considered above affecting from Project Design Option 1.**

6.6.3.15 **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

Freshwater pearl mussels

6.6.3.16 The ~~conservation objectives~~COs for freshwater pearl mussels at this designated site is to restore the favourable conservation condition of the ~~feature~~QI, this is defined and presented in Table 5.1.

6.6.3.17 There are ~~two key~~four potential ~~impacts on~~impact pathways considered for freshwater pearl mussels (via obligatory host species) associated with construction, operational and maintenance, and decommissioning of the Proposed Development, which are presented in ~~**Error! Unknown switch argument.**~~Table 6.2337 and are assessed below for each phase of the Proposed Development. These comprise injury and/ or disturbance from underwater noise caused by piling ~~and~~activities, injury and/or disturbance from underwater noise caused by other construction activities, ~~and~~ changes in EMF and accidental pollution.

6.6.3.18 With consideration that the impact severity is based on distance from the site of works, Slaney River Valley SAC (~~44.54~~47.55 km) is designated for the same QIs as Lower River Suir SAC (~~126.51~~192.63 km) and is located nearer to the Proposed Development. On this basis, it was concluded that the potential for AEoI on Annex II Fish and Shellfish is the same or reduced for ~~this site~~Lower River Suir SAC as it is for Slaney River Valley SAC. In Section 6.6.1 it has been concluded that none of the potential effects on freshwater pearl mussels would result in an AEoI of the QIs of Annex II Fish and Shellfish of the Slaney River Valley SAC.

6.6.3.19 **Therefore, there is no AEoI on the freshwater pearl mussel ~~feature~~QI of the Lower River Suir SAC, as defined by the COs of the site, as a result of any of the impacts considered above affecting from Project Design Option 1.**

6.6.3.20 **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

6.6.4 River Boyne and River Blackwater SAC

Atlantic salmon

6.6.4.1 The ~~conservation objectives~~COs for Atlantic salmon at this designated site is to restore the favourable conservation condition of the ~~feature~~QI, this is defined and presented in Table 5.1.

6.6.4.2 There are ~~two key~~four potential ~~impacts on~~impact pathways considered for Atlantic salmon associated with construction, operational and maintenance, and decommissioning of the Proposed Development, which are presented in ~~**Error! Unknown switch argument.**~~Table 6.2337 and are assessed below for each phase of the Proposed Development. These comprise injury and/ or disturbance from underwater noise caused by piling ~~and~~activities, injury and/or disturbance from underwater noise caused by other construction activities, ~~and~~ changes in EMF and accidental pollution.

6.6.4.3 With consideration that the impact severity is based on distance from the site of works, Slaney River Valley SAC (~~44.54~~47.55 km) is designated for the same QIs as River Boyne and River Blackwater SAC (~~99.86km~~123.20 km) and is located nearer to the Proposed Development. On this basis, it was concluded that the potential for AEoI is the same or reduced for ~~this site~~River Boyne and River Blackwater SAC as it is for Slaney River Valley SAC. In Section 6.6.1, it has been concluded that none of the potential effects on Atlantic salmon would result in an AEoI of the QIs for Annex II Fish and Shellfish for the Slaney River Valley SAC.

6.6.4.4 **Therefore, there is no AEoI on the Atlantic salmon ~~feature~~QI of the River Boyne and River Blackwater SAC, as defined by the COs of the site, as a result of any of the impacts considered above affecting from Project Design Option 1.**

6.6.4.5 **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

River Lamprey

6.6.4.6 The COs for River Lamprey is to restore the favourable conversation condition of the QI, this I defined and presented in Table 5.1.

6.6.4.7 There are four potential impact pathways considered for River Lamprey associated with construction, operational and maintenance, and decommissioning of the Proposed Development, which are presented in Table 6.2337 and are assessed below for each phase of the Proposed Development. These comprise injury and/ or disturbance from underwater noise caused by piling activities, injury and/or disturbance from underwater noise caused by other construction activities, changes in EMF and accidental pollution.

6.6.4.8 With consideration that the impact severity is based on distance from the site of works, Slaney River Valley SAC (47.55 km) is designated for the same QIs as River Boyne and River Blackwater SAC (123.20 km) and is located nearer to the Proposed Development. On this basis, it was concluded that the potential for AEoI is the same or reduced for River Boyne and River Blackwater SAC as it is for Slaney River Valley SAC. In Section 6.6.1, it has been concluded that none of the potential effects on River Lamprey would result in an AEoI of the QIs for Annex II Fish and Shellfish for the Slaney River Valley SAC.

6.6.4.9 **Therefore, there is no AEoI on the River Lamprey QI of the River Boyne and River Blackwater SAC, as defined by the COs of the site, as a result of any of the impacts considered above affecting from Project Design Option 1.**

6.6.4.10 **Based on the representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

6.6.5 Conclusion of Stage 2 Appraisal for Sites Screened in for Migratory Fish Species QIs

6.6.5.1 Three potential impacts were assessed for migratory fish resulting from construction, operational and maintenance and decommissioning of the Proposed Development, the results of this assessment can be seen in ~~**Error! Unknown switch argument.**~~Table 6.2640.

Table 6.~~26~~40: Conclusion for the assessment of potential impacts on sites screened in for migratory fish QIs

Potential impact	Differences between Project Design Option 1 and 2	Conclusion
Injury and/or disturbance from UWN and vibration during pile driving and cable installation	Project Design Option 1 presents a larger risk of underwater noise as a higher number of monopile foundations require installation, therefore, piling will take place over a longer period of time. Underwater noise produced by piling will therefore take place over a longer period of time.	No AEoI for Slaney River Valley SAC, River Barrow and River Nore SAC, Lower River Suir SAC or River Boyne and River Blackwater SAC for any migratory fish receptors

Potential impact	Differences between Project Design Option 1 and 2	Conclusion
Underwater noise resulting from other activities	No difference between Project Design Option 1 and 2	No AEoI for Slaney River Valley SAC, River Barrow and River Nore SAC, Lower River Suir SAC or River Boyne and River Blackwater SAC for any migratory fish receptors
EMF	No difference between Project Design Option 1 and 2	No AEoI for Slaney River Valley SAC, River Barrow and River Nore SAC, Lower River Suir SAC or River Boyne and River Blackwater SAC for any migratory fish receptors
Accidental pollution	Option 1 consists of a larger number of foundations to be installed – 55 monopile foundations in total (53 for WTGs and 2 for OSPs), whilst Project Design Option 2 comprises of 47 foundations in total (47 for WTGs and 2 for OSPs). Therefore, Project Design Option 1 will have a marginally greater potential for accidental pollution.	No AEoI for Slaney River Valley SAC, River Barrow and River Nore SAC, Lower River Suir SAC or River Boyne and River Blackwater SAC for any migratory fish receptors

6.7 Baseline information to inform Stage 2 AA for Intertidal and Offshore Ornithology QIs

6.7.1.1 As outlined in Section 5.2 above, the following designated sites have continued through the Stage 1 Screening Assessment to be assessed in Stage 2 as a ~~likely significant effect~~LSE could not be ruled out. These are presented in Figure 6.~~14~~24Figure 6.~~14~~24:.

- Howth Head Coast SPA – Kittiwake;
- Ireland's Eye SPA – Guillemot, Herring gull, Kittiwake, Razorbill;
- Lambay Island SPA – Guillemot, Herring gull, Kittiwake, Lesser black-backed gull, Razorbill;
- Saltee Islands SPA – Gannet, Guillemot, Herring gull, Kittiwake, Lesser black-backed gull, Razorbill;
- Skerries Island SPA – Herring gull;
- The Murrough SPA -Red-throated diver; and
- Wicklow Head SPA – Kittiwake.

~~6.7.1.2 Following completion of the screening exercise, the boundary of the Murrough SPA was extended offshore such that the minimum distance between the SPA and the Proposed Development reduced from 10.1 km to 8 km. It is considered that wintering red-throated diver may be displaced within distances of up to 10 km from offshore windfarms (SNCBs 2022). While this would indicate there is potential for the Proposed Development to displace red-throated divers from the area of the SPA within 10 km, given that the designated red-throated diver population is 32 individuals and the site area has been increased from 940 ha to 9,767 ha, of which only a small amount would be within 10 km of the Proposed Development and this would be at the seaward edge in areas expected to be of lower density for this species (which favours areas inshore with shallower depths). It is therefore reasonable to conclude that any resulting change in density of this species within the remainder of the SPA would have an undetectable affect. Therefore, this boundary update does not change the original determination to screen the SPA out for assessment.~~

6.7.1.2 ~~6.7.1.3~~ The Proposed Development does not overlap any of these designated sites. The closest site is Wicklow Head SPA which is a minimum of 5.27 km from the Proposed Development. However, seabirds are highly mobile with large breeding season foraging ranges and so the above sites have been screened in due to potential LSE on the qualifying features caused by the Proposed Development. The Stage 1 screening concluded that there was potential for LSE via displacement risk during construction and operational phase, and collision risk during operational phase.

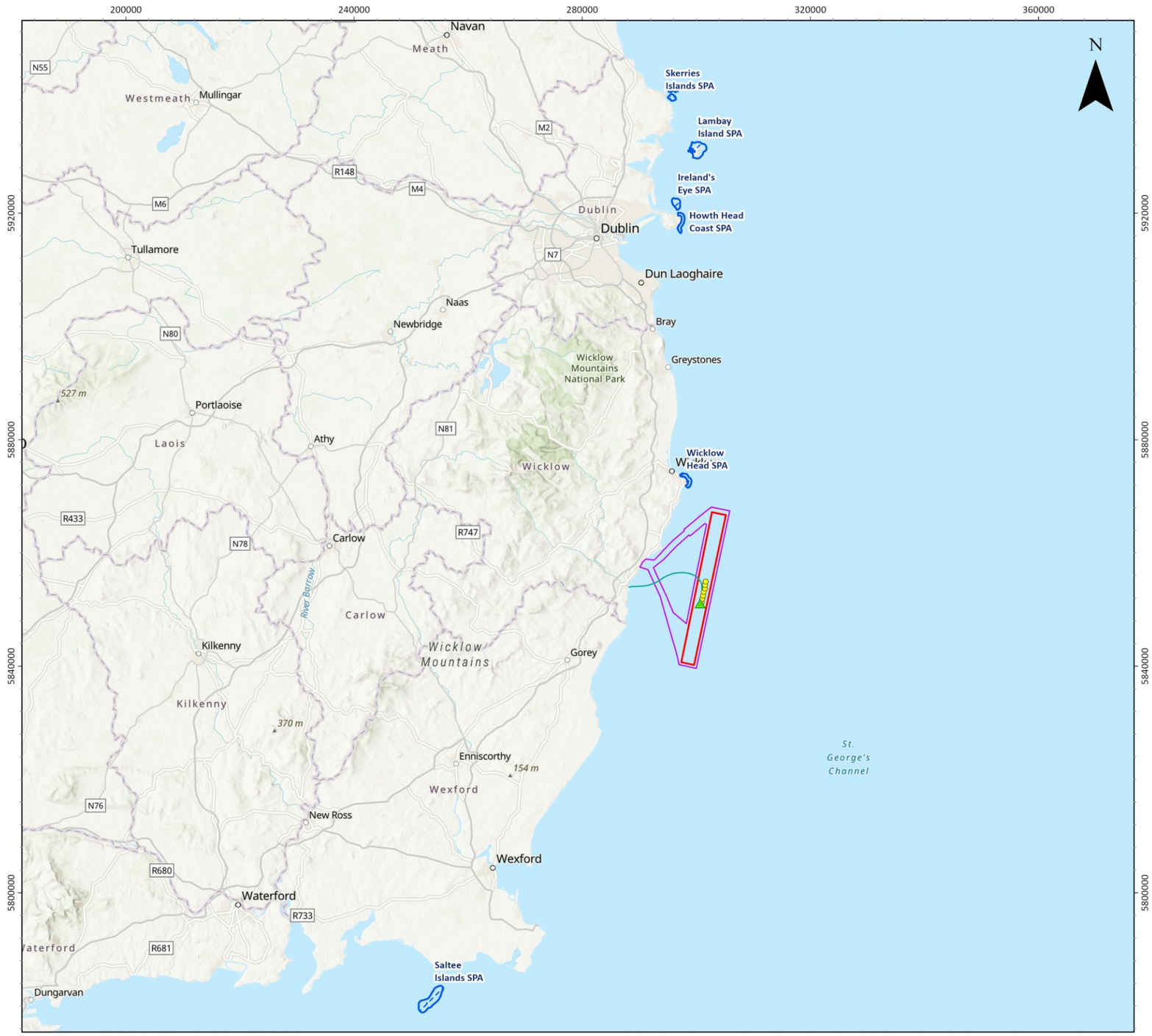
6.7.1.3 ~~6.7.1.4~~ In reaching determinations about which species and SPAs should be screened in, ecological and behavioural aspects were considered in relation to the risks posed by offshore windfarm development to seabirds, specifically collision risk and displacement (within the latter, barrier effects were also considered).

6.7.1.4 ~~6.7.1.5~~ Collision risk varies between seabird species in relation to flight characteristics and in particular flight height. For those species which breed at SPAs within their species-specific foraging ranges, the species sensitivity reviews of Garthe and Hüppop (2004); Furness and Wade (2012) and Wade *et al.*, (2016) were used as a coarse filter (i.e. to screen out those species at very low or negligible risk of collisions irrespective of abundance in the Array Area), in combination with the results of surveys of the Array Area (i.e. to further screen out species with non-negligible theoretical collision risks but present in such low numbers that no population level effect would occur). This enabled identification of species and SPA combinations for which ~~a Likely Significant Effect~~an LSE for collision risk could not be ruled out.

6.7.1.5 ~~6.7.1.6~~ Displacement risk similarly varies among species, and in general those species at risk of displacement impacts are those not considered at risk of collisions and vice versa. The species sensitivity reviews (Garthe and Hüppop, 2004; Furness and Wade, 2012 and Wade *et al.*, 2016)

were used as a coarse filter (i.e. to screen out those species at very low or negligible risk of displacement irrespective of abundance in the Array Area), in combination with the results of surveys of the Array Area (i.e. to further screen out species with non-negligible theoretical displacement risks but present in such low numbers that no population level effect would occur). This enabled identification of species and SPA combinations for which a ~~Likely Significant Effect~~LSE for displacement risk could not be ruled out.

6.7.1.6 ~~6.7.1.7~~ A summary of the site-specific surveys undertaken to inform the Stage 2 appraisal on seabirds is provided in Table 6.~~27~~41Table 6.~~27~~41.



sse Renewables

Arklow Bank Wind Park 2

Sites Assessed at Stage 2 (AA) for Intertidal and Offshore Ornithology

Legend

- ABWP2 Array Area
- ABWP2 Cable Corridor and Working Area
- ABWP1 WTGs
- ABWP1 Existing Met Mast
- ABWP1 Existing Export Cable
- ABWP1 Array Area
- Special Protection Area (SPA)



Notes

Esri UK, Esri, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS, Esri, CGIAR, USGS, Esri UK, Esri, TomTom, Garmin, FAO, NOAA, USGS, Esri, GEBCO, Garmin, NaturalVue. Contains Ordnance Survey data © Crown copyright and database rights (2022). OS OpenData.

Coordinate System:
ETRS 1989 UTM Zone 30N

0 10 20 km

0 7 13 nm

Scale	Date	Drawn By	Checked By	Approved By
1:650,000 @ A3	05/04/2024	GB	EM	LK

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Figure Number 6.14

Figure Reference: Ark_014_Stage2Sites_Ornithology_NIS_Fig6.14

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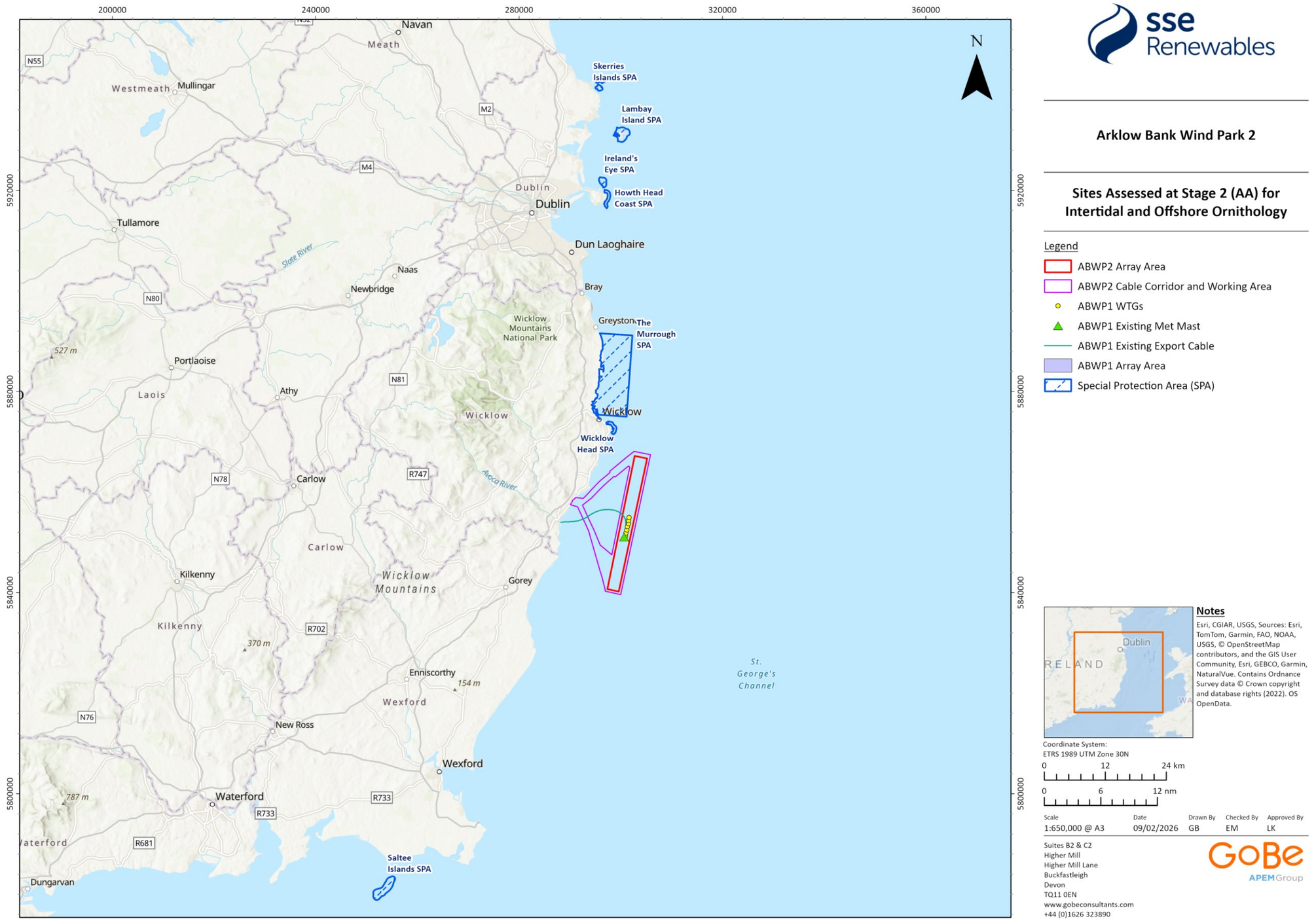

Figure Reference: Ark_Fig6.24_Stage2Sites_Ornithology

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Figure 6.~~14~~24: Sites assessed at Stage 2 (AA) for Intertidal and Offshore Ornithology

6.7.2 Baseline Environment

6.7.2.1 A summary of the site-specific surveys undertaken to inform the Stage 2 appraisal on seabirds is provided in Table 6.~~27~~41Table 6.~~27~~41.

Table 6.~~27~~41: Summary of site-specific survey data for seabirds

Data source	Overview of survey	Survey contractor	Date	Reference to further information
Baseline digital aerial survey (DAS)	DAS	HiDef Aerial Surveying Limited	March 2018 to February 2020 (excluding April 2019 plus April 2020), August 2023 to June 2024 and February to July 2025 [43 surveys in total]	NIS Volume III, Appendix 12.1: Offshore Ornithology Technical Report – Overview (Revised March 2026)
Intertidal survey of landfall location	Visual and walkover surveys	Dixon Brosnan	November 2019 to March 2020	NIS Volume III, Appendix 12.11: Offshore Ornithology Technical Report - Onshore Cable Route and Landfall - Baseline Bird Survey~~.~~
Seabird flight height surveys	Boat-based recording of seabird flight heights in array area (with a focus on kittiwake)	APEM	September 2025 to January 2026	NIS Volume III, Appendix 12.17: Kittiwake Flight Height Survey Report (RFI March 2026)
Wicklow Head SPA Surveys	Annual surveys of the Wicklow Head kittiwake colonies including seabird census, colony count, disturbance and productivity	APEM	Breeding seasons 2023, 2024, 2025	NIS Volume III, Appendix 12.16: Wicklow Head Seabird Monitoring (RFI March 2026)
Tracking of Black-legged kittiwake distribution in the Irish Sea	GPS and geolocator studies of breeding adult kittiwake at Wicklow Head SPA	UCC	2024 and 2025	NIS Volume III, Appendix 12.18: Kittiwake Tracking Report (RFI March 2026)

Digital Aerial Survey (DAS)

6.7.2.2 These surveys were carried out to inform the baseline for the Proposed Development. Aerial digital methods are widely accepted as an appropriate methodology for collecting baseline data for offshore wind development, both in the UK and Ireland (see for example, DCCAE, ~~2018~~2018a). Aerial surveys of seabirds (and marine mammals) commenced in March 2018 and continued monthly until February 2020 with an additional month (April 2020) added to cover a missed survey in April 2019 (due to adverse weather). Additional surveys were conducted between August 2023 and June 2024 and February to July 2025, bringing the total number of monthly surveys to 43. The surveys were conducted by HiDef from an aircraft equipped with four HiDef Gen II cameras with sensors to set resolution of 2 cm ground sample distance (GSD). The transects were completed at a height of ~550 m above sea level (ASL) and a target flight speed of 220 km per hour.

6.7.2.3 The survey comprised 20 transects spaced 2 km apart, extending perpendicularly from the coast to more than 4 km beyond the Proposed Development's seaward boundary (actual distance beyond the seaward boundary varied across the survey, between 5-6 km). The total transect length was approximately 340 km, and viewed imagery gave 10% coverage of the study area (i.e. a strip width of 200 m). Details are provided in NIS Volume III, Appendix 12.1 Offshore Ornithology Technical Report – Overview~~.~~ (Revised March 2026)

Intertidal Ornithology Survey

6.7.2.4 Six observer-based surveys across the Intertidal Ornithology Study Area were conducted between November 2019 and March 2020 to investigate wintering bird presence and one breeding survey was conducted in July 2020 (Appendix 12.11 Offshore Ornithology Technical report - Onshore Cable Route and Landfall - Baseline Bird Survey). For each wintering bird survey, three counts were made of the coastal waters from vantage points at Arklow town (vantage point A), Johnstown North (Vantage point B) and at Johnstown South (Vantage Point C). At each vantage point (VP), a 180° scan using a 20x telescope and 8x binoculars was made of the inshore waters and adjacent intertidal land and all species of wildfowl, waders and gulls observed were recorded. The breeding seabird survey looked for suitable habitat and signs of seabird breeding (e.g. guano splash on cliff faces etc.)

6.7.2.5 The data collected during these surveys have been used to identify the species present in the intertidal area.

Historical survey data

6.7.2.6 Historical data were reviewed to supplement the recent site-specific surveys. This included data from boat surveys conducted monthly across a portion of the Array Area between July 2000 and June 2010; and aerial surveys of the western Irish Sea conducted in 2016 for the ObSERVE project (Jessopp *et al.*, 2018).

ECOLOGY OF SPECIES SCREENED FOR ASSESSMENT

KITTIWAKE

6.7.2.7 The kittiwake is a small cliff-nesting gull. It breeds in a large number of colonies around the coast of Britain and Ireland. Kittiwake numbers increased dramatically throughout the British Isles between 1900 and 1985, however started to decline during the 1980s in the North of their range, particularly in Shetland, when the local sandeel stock suffered recruitment failure (Mitchell *et al.*, 2004). Numbers have declined considerably since the 1980s, although this decline has been most marked in the north and east (e.g. Shetland) and less severe to the south and west (e.g. England and the west coast of Scotland; Mitchell *et al.*, 2004). The population trend in Ireland between the 1970s and 2000 was largely stable, although a survey conducted in 2015 found a decline of

around a third in many colonies and more recent surveys indicate this decline has been maintained (Cummins *et al.*, 2019). Within UK regions, declines have been greatest in SPA populations (of which there are many) (Furness, 2015) because they are the largest colonies and furthermore, food shortage affects breeding success and recruitment at large colonies more than at small ones (Coulson, 2011).

6.7.2.8 Kittiwakes feed on marine invertebrates, small fish (especially sandeels), and fishing vessel waste (mostly fragments of offal and fish as they are unable to swallow large fish). Sandeels are a key prey during the breeding season (Furness and Tasker, 2000; Coulson, 2011) whereas fishery waste is taken mostly during winter (Garthe *et al.*, 1996).

6.7.2.9 Breeding success of kittiwakes colonies can be closely linked with sandeel stock abundance in areas near colonies, especially in the North Sea (Frederiksen *et al.*, 2004, 2005; Cook *et al.*, 2014). Irish Sea kittiwakes may take a more diverse range of fish prey, including sprat, but very little detailed study of diet in this area has been published (Chivers *et al.*, 2012, 2013). Breeding kittiwakes mostly feed close to their colony, although as more tracking studies have been conducted the estimated foraging ranges have increased; the mean foraging range is 55 km, the mean maximum foraging range is 156 km, and the longest foraging range recorded up to 2019 was 770 km (Woodward *et al.*, 2019). Several tracking studies provide evidence on foraging ranges of breeding kittiwakes and winter movements from different populations. Tracking studies by RSPB show that chick-rearing kittiwakes from Flamborough and Filey Coast SPA mainly feed within 50 km of that colony, but sometimes may travel as far as the Dogger Bank to forage (Carroll *et al.*, 2017; Wischnewski *et al.*, 2018).

6.7.2.10 Kittiwakes disperse from colonies in late summer and may migrate from British and Irish colonies as far as Canada, the central North Atlantic, the Bay of Biscay and the Barents Sea. In the nonbreeding season, British and Irish waters hold a mixture of birds from many breeding areas, including Norway and Russia (Frederiksen *et al.*, 2012).

GANNET

6.7.2.11 Gannets are the largest breeding seabird in the British Isles and are able to swallow fish up to at least the size of adult herring and mackerel (Nelson, 1978). As a result, they can feed on a wide range of fish, from sandeels to mackerel and discards from fishing vessels (Nelson 1978; Garthe *et al.*, 1996). They are also aggressive at sea, displacing smaller seabirds from food and so can access discards from fishing vessels more efficiently than other scavenging seabirds (Garthe *et al.*, 1996). Gannets dive for fish, often from considerable height, and so can be at risk of collision with wind turbine blades while foraging. Foraging activity is by sight and hence birds do not forage during the dark but spend the night either in the colony or sitting on the sea surface (Nelson, 1978; Hamer *et al.*, 2000; Hamer *et al.*, 2007; Garthe *et al.*, 2012).

6.7.2.12 Gannets breed in a relatively small number of colonies, many of which are very large, and all of which are in locations relatively remote from human disturbance and from predatory mammals.

6.7.2.13 Breeding adults have efficient commuting flight and can travel long distances while searching for food. Numerous tracking studies show foraging ranges of breeding adults and overwinter migrations from many different colonies. Breeding adults tend to remain within a foraging area that is discrete to the individual colony (i.e. birds rarely overlap in foraging distribution with birds from neighbouring colonies; Wakefield *et al.*, 2013). Gannet numbers have increased continuously from 1900 to the present, although the rate of population increase has been slowing in the last few years (Murray *et al.*, 2015). Gannets migrate, with birds from Britain mainly wintering off west Africa and southern Europe, and many of the birds wintering around the British Isles are adults from colonies in Norway or Iceland (Fort *et al.*, 2012; Garthe *et al.*, 2016).

HERRING GULL

6.7.2.14 The herring gull is widespread throughout Britain and Ireland, especially around coasts but also in urban environments. The population in Ireland has more than doubled over the last two decades at natural sites, and indications are that even greater increases have occurred at urban sites (Burnell *et al.* 2023). Most herring gull are either resident year-round or undertake local migration of no more than a few hundred kilometres at most (O'Hanlon *et al.*, 2022). A wide range of habitats are utilised, including marine, intertidal, arable and urban locations, with a shift towards terrestrial and urban sites in the nonbreeding season (O'Hanlon *et al.*, 2022). Herring gulls often fly at turbine rotor height and therefore may be vulnerable to collisions (Johnston *et al.*, 2014).

LESSER BLACK-BACKED GULL

6.7.2.15 The lesser black-backed gull breeds in moderate numbers in Ireland and the population has more than doubled over the last two decades, mostly in coastal areas but also in urban sites and some inland sites such as moorland (Burnell *et al.*, 2023). It is primarily a summer visitor, with most birds migrating to southern Europe or north Africa for the winter (Wernham *et al.*, 2002). Breeding numbers increased considerably during the 20th century, probably in part due to provision of fishery discards (Camphuysen 2013). Male lesser black-backed gulls forage mostly at sea, whereas females forage more in terrestrial habitats (Camphuysen *et al.*, 2015). Habitat use is also seasonal, with greater use of inland foraging early and late in the breeding season, and peak marine foraging activity during chick-rearing (Thaxter *et al.*, 2015). Lesser black-backed gulls sometimes fly at heights that make them vulnerable to collision with turbine blades, especially during the day (Ross-Smith *et al.*, 2016). Although they do not show macro-avoidance (i.e. complete avoidance of entire offshore windfarm areas) of offshore windfarms, tracking data suggest a high level of meso-avoidance of turbines (i.e. birds do not approach close to the rotor blades; Thaxter *et al.* 2018, Johnston *et al.*, 2022).

GUILLEMOT

6.7.2.16 The guillemot is a large auk which breeds throughout the northern temperate and colder parts of the Atlantic, Pacific and adjacent Arctic waters. Two sub-species breed around the British Isles, the dark-mantled nominate race aalge occurs in most of Europe including Scotland and possibly northern England; the smaller, much browner mantled albionis occurs in England, Wales, Ireland, Helgoland, France and Iberia. Guillemots breed widely around the coasts using suitable cliff habitat. They form large colonies typically grouping together along suitable ledges, where they lay a single large egg which is incubated directly on the bare rock.

6.7.2.17 Guillemots catch fish by flying underwater, and in order to do so have relatively small wings to reduce drag in the viscous liquid medium. This results in high wing loading that constrains their ability to fly in the air, and as a consequence they tend to avoid flying due to the relatively high energy costs. When they fly, they tend to fly low over the sea surface, at high speed in a straight line. Therefore, their risk of colliding with offshore wind turbines is low. However, they show displacement from offshore windfarms (Dierschke *et al.*, 2016) and are sensitive to disturbance and displacement by ship traffic (Fliessbach *et al.*, 2019). When breeding, they have to fly out from the colony to forage, and foraging distances from large colonies can be tens of kilometres. However, guillemot chicks fledge when only partly grown, and travel out to sea by swimming, led to foraging areas away from the colony by their male parent. Adults moult rapidly after the breeding season, becoming flightless for a period. It is likely that they select areas with reliable food fish availability for moulting but details of the moult locations used are not yet clear. After the moult, birds move to wintering areas. In general, many guillemots spend the winter not far from their breeding area but dispersed over the sea (Buckingham *et al.*, 2022). There is evidence from maps of guillemot densities at sea that they tend to aggregate to an extent over some shallow sandbanks. The ObSERVE study reported particularly dense areas of guillemots (and razorbills,

as the two species were difficult to distinguish) in autumn in the northernmost region of the Irish part of the Irish Sea, with more dispersed observations in summer and winter.

RAZORBILL

6.7.2.18 The razorbill is a large auk which breeds around the North Atlantic. There are two subspecies; nominate A. t. torda breeds in eastern North America, Greenland, Bear Island, White Sea, Norway, Denmark, and Baltic Sea. Subspecies islandica breeds in Iceland, Faroe, British Isles, Germany, and France. Razorbills breed in colonies on cliff ledges, on sea stacks, or under boulders below cliffs. Nest sites differ from those of common guillemots, with razorbill nests more often among boulders and more often scattered rather than in high-density groups. They lay a single egg onto bare rock but will replace lost eggs around 14 days later. While breeding, razorbills forage by diving to catch fish by underwater pursuit, feeding chicks especially on sandeels and sprats, and generally taking smaller fish than caught by common guillemots.

6.7.2.19 British and Irish razorbills generally move south after breeding, wintering from British waters to Iberia including the western Mediterranean (Wernham *et al.*, 2002). However, many British razorbills, especially adults, remain in British waters all year round (Buckingham *et al.* 2022). Rather few foreign-ringed razorbills have been recovered in Britain, but these together with biometrics of tideline corpses indicate that some birds from Scandinavia (from the subspecies torda) winter in British waters and some birds from Iceland do too (Wernham *et al.*, 2002).

6.7.2.20 Razorbills catch fish by flying underwater, and in order to do so have relatively small wings to reduce drag in the viscous liquid medium. This results in high wing loading that constrains their ability to fly in the air, and as a consequence they tend to avoid flying due to the relatively high energy costs. When they fly, they tend to fly low over the sea surface, at high speed in a straight line. Therefore, their risk of colliding with offshore wind turbines is low. However, they show displacement from offshore windfarms (Dierschke *et al.*, 2016) and are sensitive to disturbance and displacement by ship traffic (Fliessbach *et al.*, 2019). When breeding, they have to fly out from the colony to forage, and foraging distances from large colonies can be tens of kilometres. However, razorbill chicks fledge when only partly grown, and travel out to sea by swimming, led to foraging areas away from the colony by their male parent. Adults moult rapidly after the breeding season, becoming flightless for a period. After the moult, birds move predominantly southwards to wintering areas. There is evidence from maps of razorbill densities at sea that they tend to aggregate to an extent over some shallow sandbanks. The ObSERVE study reported particularly dense areas of razorbills (and guillemots, as the two species were difficult to distinguish) in autumn in the northernmost region of the Irish part of the Irish Sea,~~,~~ with more dispersed observations in summer and winter.

RED-THROATED DIVER

6.7.2.21 Wintering red-throated divers are associated with shallow inshore waters (normally between 2 and 20m deep), often occurring within sandy bays (Poot et al. 2009), firths and sea lochs, although open coastline is also frequently used (Skov et al. 1995; Stone et al. 1995). The distribution and concentrations of red-throated divers will at least in part be determined by the presence, abundance, and availability of their prey fish species (Poot et al. 2009), especially sprats and young herring in winter, although a wide variety of small fish species can be taken (Guse et al. 2009). Red-throated divers typically arrive in their wintering areas in September to November and depart to their breeding areas from February to April (Brown and Grice 2005). Small numbers, mostly of birds in their first year of life, remain in the wintering areas through summer (Furness 2015).

6.7.2.22 Red-throated divers are highly sensitive to non-physical disturbance by noise and visual presence during the winter (Garthe and Hüppop 2004, Furness et al. 2013). Petersen et al. (2006) reported a marked post-construction avoidance of the Horns Rev offshore windfarm, including also the

2km and 4km zones around it. A similar, though less pronounced avoidance response to the Nysted offshore windfarm by red-throated divers was also recorded (Petersen et al. 2006). Data from Kentish Flats offshore windfarm suggest a decreasing displacement effect with distance from the wind turbine footprints (Percival 2010). Analysis of diver survey data collected in the Outer Thames to investigate windfarm effects identified shipping activity as one of only two covariates which explained significant amounts of the variation in the species' spatial distribution (bathymetry was the second; APEM 2016). This study found evidence for decreases in diver densities during windfarm construction compared with those observed prior to construction, but also indicated that following construction diver densities rapidly returned to previous levels (although this was caveated as a preliminary result). Recent studies in the German Bight also show very strong avoidance by red-throated divers of operational offshore windfarms and of associated ships in that area (Mendel et al. 2019). A report on the results of more recent surveys of the Outer Thames Estuary SPA (Irwin et al. 2019) proposed similar avoidance of shipping and wind turbines, although this conclusion was based on preliminary observations rather than analytical estimates.

6.7.2.23 The boundary of the Murrough SPA was extended offshore in 2023 such that the minimum distance between the SPA and the Proposed Development reduced from 10.1 km to 8 km. It is considered that wintering red-throated diver may be displaced within distances of up to 10 km from offshore windfarms (SNCBs 2022). The 10 km buffer of the Array overlaps with 5.3 km^2 of the SPA, which represents 5.4% of the SPA area. There is therefore potential that the Proposed Development may reduce the density of red-throated divers from this overlap area of the Murrough SPA.

6.7.3 Avoidance through Design and Standard Project Environmental Protection Measures of the Proposed Development

6.7.3.1 The design of the Proposed Development is such that some potential impact can be avoided as seen by applying the design features relevant to intertidal and offshore ornithology receptors which are presented in Table 6.~~28~~42Table 6.~~28~~42**.**

Table 6.~~28~~42: Project design and environmental protection measures relevant for intertidal and offshore ornithology receptors

Measure	Justification
Impact avoidance/ reduction through an Environmental Management Plan (EMP) which has been prepared and will be implemented during the construction, operational and maintenance and decommissioning phases of the Proposed Development. The RWMP include mitigation/monitoring measures and commitments made within the EIAR and a Marine Pollution Contingency Plan (MPCP) which will include key emergency contact details (e.g. EPA). An EMP is included in NIS Volume III, Appendix 25.1: Environmental Management Plan.	Measures will be implemented to ensure that the potential for release of pollutants from construction, operational and maintenance, and decommissioning plant is minimised. These include: Storage of chemicals in secure designated area in line with appropriate regulations and guidelines; Double skinning of pipes and tanks containing hazardous substances; Storage of these substances in impenetrable bunds; Working vessels will handle all wastes in accordance with International Maritime Organisation (IMO) requirements and in accordance with the requirements of national legislation (i.e. Sea Pollution Acts 1991 to 1999; Sea

Measure	Justification
	Pollution (Miscellaneous Provisions) Act 2006) as applicable; All waste and/or litter, including potential pollutants produced during construction and/or operation of the windfarm will be stored and returned to shore for authorised disposal at suitable facilities; and Vessel refuelling will take place in port or under permit from the Irish Coast Guard. In this manner, accidental release of contaminants from vessels will be strictly controlled, thus providing protection for marine life across all phases of the Proposed Development. Any accidental pollution of the marine environment will be immediately reported to the Irish Coastguard and to any other local authorities who are likely to be affected by such pollution.
The Developer confirms and commits that it will not carry out any works in respect of the Proposed Development under the planning permission (if granted) at the same time as any activities the subject of the Foreshore Licence for Site Investigations (FS007339)	The Developer was granted a Foreshore Licence (FS007339) for Site Investigations (associated with the Proposed Development) from the Minister for Housing, Local Government and Heritage in May 2022. The Developer confirms and commits that it will not carry out any works in respect of the Proposed Development under the planning permission (if granted) at the same time as any activities the subject of the Foreshore Licence for Site Investigations (FS007339) being carried out. As such there is no temporal overlap between the activities consented in this Foreshore Licence and the Proposed Development and there will be no potential for cumulative effects.
The Developer confirms and commits that it will not carry out any works in respect of the Proposed Development under the planning permission (if granted) at the same time as any activities the subject of the Foreshore Licence Application for Site Surveys FS007555 (should a licence be granted) are being carried	The Developer submitted a Foreshore Licence Application for Site Surveys to the Minister for Housing, Local Government and Heritage in April 2023 (FS007555) and this application is pending determination. The Developer confirms and commits that it will not carry out any works in respect of the Proposed Development under the planning permission (if granted) at the same time as any activities the subject of the Foreshore Licence Application for Site Surveys FS007555 (should a licence be granted) are being carried out. As such there is no temporal overlap between the activities proposed in the Foreshore Licence Application and the Proposed Development.

Measure	Justification
Maximum number of wind turbines of ~~56~~53.	The number of wind turbines has been refined to minimise the potential collision risk impacts (see Chapter 4: Consideration of Alternatives).
Minimum lower blade tip height of 37 m above LAT	Minimises potential seabird collision risks since the abundance of birds decreases with increasing height above the sea surface.

6.7.4 Impacts and Parameters Assessed

6.7.4.1 Both Project Design Options identified in Table 6.~~29~~43Table 6.~~29~~43 have the potential to result in AEoI on intertidal and offshore ornithology receptors.

6.7.4.2 Note that Project Design Option 1 has two variants (identified as WTG Model 1a and 1b) which differ only in the blade chord width and the average rotation speed. As these parameters can result in different predicted collision risks both WTG Model 1a and 1b have been assessed, as well as for WTG Model 2.

Table 6.~~29~~43: Project Design Options 1 and 2 considered for the assessment of potential impacts on intertidal and offshore ornithology receptors

Potential impact	Phase			Project Design Option Assessed (1 and 2)	Parameter Differences Between Project Design Option 1 and 2 (if any)
	C	O	D		
Disturbance and displacement	✓	✓	✓	Project Design Option 1 **Construction Phase:** Disturbance and displacement from construction activity, including increased vessel and helicopter activity: • Installation of ~~56~~53 Wind Turbine Generators (WTGs) and 2 OSPs within the Array Area; • Maximum of 1 foundation installed at any one time (within any 24 hour period); • Maximum of 69 installation vessels in the Array Area at any one time (including 12 installation vessels along the offshore Cable Corridor and Working Area at any one time, and maximum of 7 installation vessels in the vicinity of the landfall at any one time); • Maximum of 3 helicopters in the Array Area at any one time; and • Maximum construction schedule of 24 hours a day, 7 days a week for a maximum construction period of ~~5~~4 years. Within this period, offshore export cable installation may take place over a period of 12 months. **Operational and maintenance phase:** Disturbance and displacement from operational and maintenance activity, including increased vessel and helicopter activity: • Presence of ~~58~~55 (i.e. ~~56~~53 x WTG + 2 x OSP) monopile foundations with base ~~diametre~~diameter between 7 – 11 m for WTGs and 7-14 m for OSPs and associated scour protection; • Presence of associated cable protection for between 110 – 122 km inter-array cables and between 35 – 40 km offshore export cables. Assumes a maximum of 15% of inter-array cable route, 50% of interconnector and 20% of offshore export cable route may require cable protection; • Minimum spacing of 500 m between turbine blade tips; • A maximum of 1,359 vessel return trips per annum for supporting windfarm operations comprised of crew transfer vessels, jack-up vessels, cable repair vessels and other vessels;	Within the construction phase Project Design Option 1 consists of a larger number of foundations to be installed – ~~58~~55 monopile foundations in total, whilst Project Design Option 2 comprises of 49 foundations. Therefore, Project Design Option 1 will have a marginally greater potential for Disturbance and Displacement. Within the Operational and Maintenance phase Project Design Option 1 comprises of ~~56~~53 operational turbines, whilst Project Design Option 2 comprises of 47 operational turbines. Therefore, Project Design Option 1 will have a marginally greater potential for Disturbance and Displacement. Within the Decommissioning Phase Project Design Option 1 will result in the deconstruction and removal of all ~~56~~53 WTGs, 2 OSPs and associated infrastructure, whilst Project Design Option 2 consists of the deconstruction and complete removal of all 47 WTGs and associated infrastructure. Therefore, Project Design Option 1 will have a marginally greater

Potential impact	Phase			Project Design Option Assessed (1 and 2)	Parameter Differences Between Project Design Option 1 and 2 (if any)
	C	O	D		
				• A maximum of 485 helicopter movements making return trips per annum for supporting windfarm operations; and Operational phase of 36.5 years. **Decommissioning Phase:** Disturbance is anticipated to be similar in nature but of lower magnitude than during construction.	potential for disturbance and displacement. Therefore, overall Project Design Option 1 ~~has a higher potential for impact than~~is considered conservatively representative of Project Design Option 2 in respect of potential for disturbance and displacement.
	✓	✓	✓	Project Design Option 2 **Construction Phase:** Disturbance and displacement from construction activity, including increased vessel and helicopter activity and confirmatory surveys (see Volume I, Supporting Information for Screening for Appropriate Assessment Report) • Installation of 47 WTGs and 2 x OSPs within the Array Area; A maximum of 1 foundation installed at any one time (within any 24 hour period); • A maximum of 69 installation vessels in the Array Area at any one time (including 12 installation vessels along the Cable Corridor and Working Area at any one time, and 7 installation vessels in the vicinity of the landfall at any one time); • A maximum of 3 helicopters in the Array Area at any one time; and • Maximum construction schedule of 24 hours a day, 7 days a week for a maximum construction period of ~~5~~4 years. Within this period, offshore export cable installation may take place over a period of 12 months. **Operational and Maintenance Phase:** Disturbance and displacement from operational and maintenance activity, including increased vessel and helicopter activity: • Presence of 49 (i.e. 47 x WTG + 2 x OSP) monopile foundations with base diametre between 7 – 11 m for WTGs and 7-14 m for OSPs and associated scour protection; • Presence of associated cable protection for between 110 – 122 km inter-array cables and between 35 – 40 km offshore export cables. Assumes a	

Potential impact	Phase			Project Design Option Assessed (1 and 2)	Parameter Differences Between Project Design Option 1 and 2 (if any)
	C	O	D		
				maximum of 15% of inter-array cable route, 50% of interconnector and 20% of offshore export cable route may require cable protection; • Minimum spacing of 500 m between turbines; • A maximum of 1,359 vessel return trips per annum for supporting windfarm operations comprised of crew transfer vessels, jack-up vessels, cable repair vessels and other vessels; • A maximum of 485 helicopter movements making return trips per annum for supporting windfarm operations; and • Operational phase of 36.5 years. **Decommissioning Phase:** Disturbance is anticipated to be similar in nature but of lower magnitude than during construction.	
Collision risk	X	✓	X	Project Design Option 1 **Operational Phase:** • Presence of ~~56~~53 wind turbines within the Array Area: • Hub height of 155 m above Lowest Astronomical Tide (LAT); • Lower blade tip height of 37 m above LAT; • Upper blade tip height of 273 m above LAT; and • Rotor ~~diametre~~diameter of 236 m. • Average rotation speed (RPM): 1a = 6.34; 1b = 5.73 Further details are provided in NIS Volume III, Appendix 12.4: Offshore Ornithology~~:~~ Technical Report - Seabird Collision Risk Model Input Parameters (Revised March 2026)	Collision risk is a function of all the turbine parameters so it is necessary to undertake collision risk modelling to identify impacts for any given design. All options have been assessed.

Potential impact	Phase			Project Design Option Assessed (1 and 2)	Parameter Differences Between Project Design Option 1 and 2 (if any)
	C	O	D		
	X	✓	X	Project Design Option 2 **Operational Phase:** • Presence of 47 wind turbines within the Array Area; • Hub height of 162 m above Lowest Astronomical Tide (LAT); • Lower blade tip height of 37 m above LAT; • Upper blade tip height of 287 m above LAT; and • Rotor ~~diametre~~diameter of 250 m.	Collision risk is a function of all the turbine parameters so it is necessary to undertake collision risk modelling to identify impacts for any given design. All options have been assessed.

6.8 Assessment of Proposed Development alone for Intertidal and Offshore Ornithology Receptors

6.8.1 Howth Head Coast SPA

COLLISION RISK

Kittiwake

6.8.1.1 The ~~conservation objectives~~COs for kittiwake in Howth Head Coast SPA can be found in Table 5.2.

6.8.1.2 See section 6.7.2.7 for a summary of relevant kittiwake ecology.

6.8.1.3 The only potential impacts are present within the operational and maintenance phase and so therefore the other phases of development are not considered within this qualifying features assessment.

6.8.1.4 The Howth Head Coast SPA population of kittiwakes at designation was 2,269 AON (apparently occupied nests) which equates to a breeding adult population of 4,538. More recent surveys have reported 1,773 AON (Cummins *et al.*, 2019).

6.8.1.5 The main concern with respect to windfarm impacts for kittiwakes is the risk of collision mortality. Kittiwakes were recorded in the Array Area in all months. Collision mortality predictions were estimated using the stochastic implementation (Caneco et al., 2022) of the Band (2012) Collision risk Model (CRM). The CRM uses a combination of site specific and generic parameters for seabird flight behaviour, together with turbine parameters, to predict the number of collisions per month (Appendix 12.4). The values advised by statutory conservation agencies for some of the generic seabird parameters have been investigated in recent studies (e.g. Skov et al., 2018; Bowgen and Cook, 2018; Furness et al., 2018) and the results have indicated that the current values are highly likely to be over-estimates and result in overly precautionary results. With respect to kittiwake, there is evidence that the currently recommended flight speed (13.1 m/s) is conservative and therefore an alternative evidence-based value (8.7 m/s) was considered to be more appropriate for use in the current CRM (Skov et al. 2018).

6.8.1.6 Collision risk modelling was run using both generic flight height data (referred to as Band Option updated to Jan2) and site-specific flight height data (referred to as Band Option 1), the latter data collected using boat-based surveys at three different sites: ABWP 2 (conducted between September 2025 and January 2026), the proposed Dublin Array Wind Farm (conducted between September 2016 and December 2020) and the proposed Codling Wind Farm (conducted between October 2018 and August 2020). The proportion of kittiwake estimated to be at potential collision height (PCH, >=37m from LAT) using the generic data and the three site-specific datasets are: 3.23% (generic), 0.07% (ABWP2), 0.66% (Dublin Array) and 1.6% (Codling).

6.8.1.7 There is a clear preference for the use of site-specific flight height data in guidance from both the UK (JNCC 2024) and Ireland (DCCAE 2018b). Therefore, while results of the CRM using both Band Option 2 and Band Option 1 are presented in the CRM Technical Report (Vol 2 Appendix 12.05 Offshore Ornithology Technical Report – Collision Risk Modelling Results) the assessment is based on Option 1. As can be seen in the site-specific estimates above, these have ranged between 0.07% and 1.6% at PCH. A regional estimate was calculated as the average of these three PCH estimates weighted by their sample sizes, using a lower rotor tip height of 35m (since each survey applied slightly different height bands). This gave a combined regional PCH of 0.0072 (0.72%).

6.8.1.8 Furness (2015) proposed that the full breeding season for kittiwake extends from March to August, with a migration-free breeding season of May-July. Recent tracking of kittiwake from

Wicklow Head using geolocator (GLS) tags has indicated that breeding adults return to that colony in April and depart in August (Murphy and Jessopp 2025). Therefore, collisions in March, which would be considered part of the breeding season by Furness (2015) have been allocated to the spring migration season on the basis of these locally recorded data (note that use of site specific data to refine seasonal definitions is encouraged by UK SNCBs, e.g. Parker et al. 2022).

6.8.1.9 ~~6.8.1.6~~ Using the evidence-based ~~rates,~~ flight speed and CRM Option 1 (i.e. weighted average PCH)the total kittiwake breeding season collision estimate for Project Design Option 1a was estimated to be ~~16.7~~5.0, for Project Design Option 1b was ~~18.8~~5.8 and for Project Design Option 2 was ~~16.8~~5.6 (Appendix 12.5 Offshore Ornithology Technical Report – Collision risk Modelling Results).

6.8.1.10 The total kittiwake nonbreeding season collision estimate for Project Design Option 1a was ~~170.1~~25.3, for Project Design Option 1b was ~~190.3~~28.7 and for Project Design Option 2 was ~~172.0~~27.6 (Appendix 12.5 Offshore Ornithology Technical Report – Collision Risk Modelling Results).

6.8.1.11 ~~6.8.1.7~~ The breeding season collision estimates will potentially affect individuals from colonies within range of the Proposed Development, therefore it is necessary to estimate the relative degree of connectivity between the Proposed Development and the SPAs screened into the Stage 2 appraisal. This was undertaken using the apportioning method developed for NatureScot~~1~~[7]. This method uses distance, colony size and the area of sea within the foraging range to estimate the relative contribution from each colony under consideration to the at sea abundance recorded at a given location. This calculation also included non-SPA colonies (and SPAs where kittiwakes breed but are not listed as features) to ensure that impacts were apportioned appropriately. This apportioning used the most recent colony counts where available (e.g. Burnell et al. 2023) ~~in~~ Table 6.~~30~~44. Table 6.~~30~~44 provides the calculations and outputs from the apportioning tool.

Table 6.~~30~~44: Estimated proportions of kittiwake from colonies with potential connectivity to the Proposed Development. SPA colonies assessed are highlighted in bold

Colony	Distance to Proposed Development (SPA edge to Proposed Development midpoint, km)	Colony size (AON)	Estimated sea proportion	Calculated colony weight	Apportioned Colony percentage
Lambay SPA	77	3,320	0.55	~~0.57~~0.50	~~13.8~~12.1
Irelands eye SPA	68	455	0.55	~~0.10~~0.09	~~2.4~~2.1
Rockabill	89	165	0.7	~~0.02~~0.01	0.4
Howth Head Coast SPA	64	1,773	0.55	~~0.44~~0.36	~~10.7~~9.4
Bray Head	44	873	0.5	~~0.51~~0.41	~~12.2~~10.7
Wicklow Head SPA	19	~~773~~851	0.5	~~2.41~~2.34	~~58.1~~56.1

~~1~~[7] https://www.nature.scot/doc/interim-guidance-apportioning-impacts-marine-renewable-developments-breeding-seabird-populations#Future+Approaches+to+Apportioning

Colony	Distance to Proposed Development (SPA edge to Proposed Development midpoint, km)	Colony size (AON)	Estimated sea proportion	Calculated colony weight	Apportioned Colony percentage
Saltee Islands SPA	93	1,038	0.7	~~0.10~~0.08	~~2.3~~2.0
Carreg Y Llam	103	614	0.55	0.05	1.3
Skomer	120	1544	0.68	0.07	1.9
Great Orme	164	898	0.51	0.03	0.8
Maggys Leap to Newcastle 1	154	580	0.48	0.02	0.6
Port St Mary - Sound	160	553	0.53	0.02	0.5
St Tudwals Island East	102	310	0.54	0.03	0.7
New Quay Head	125	332	0.52	0.02	0.5
Bardsey Island	78	121	0.57	0.02	0.4
Dunmore East to Red Head	121	401	0.56	0.02	0.6

~~6.8.1.8 The percentage of kittiwakes recorded within the Proposed Development predicted to originate from the Howth Head Coast SPA in the breeding season was 10.7%. Application of this rate to the total breeding season collision predictions indicates that 1.8 (Project Design Option 1a), 2.0 (Project Design Option 1b) and 1.8 (Project Design Option 2) collisions would be apportioned to the SPA.~~

~~6.8.1.9 As these collision predictions are derived from at sea survey data, they include all age classes. Kittiwake populations consist of an estimated 53% adults, with the remaining 47% distributed among sub-adult age classes (Furness, 2015). Thus, applying these age class proportions, the Howth Head Coast SPA adult collisions in the breeding season would be between 0.9 and 1.0.~~

6.8.1.12 ~~6.8.1.10 The nonbreeding season total kittiwake collision estimates, summing the autumn and spring BDMPS periods, were 170.1 (Project Design Option 1a), 190.3 (Project Design Option 1b) and 172.0 (Project Design Option 2).~~ During the nonbreeding season, kittiwakes disperse from their colonies and migrate to overwintering areas on both sides of the North Atlantic. Thus, a considerable number of birds from colonies around the Irish Sea and from further north (e.g. Scotland, Norway and Russia) will pass through or be resident in the Irish Sea (Frederiksen *et al.*, 2012). Frederiksen *et al.* (2012) analysed tracking data from a wide range of colonies and estimated their non-breeding season movements.

6.8.1.13 The Proposed Development is within the region Frederiksen *et al.* (2012) identified as the Celtic Seas and Biscay. This comprised birds from British and Irish colonies (55%) and North Sea, Norwegian and Russian colonies (45%). Thus, to estimate the wintering population and thereby estimate the proportion originating from any given breeding colony, the breeding numbers at colonies within this region were summed (using counts from Burnell *et al.*, 2023 to ensure contemporary values were used).

6.8.1.14 This yielded a total British and Irish population (all age classes) with connectivity to the Celtic Seas and Biscay region of 230,008. Allowing for Norwegian and Russian birds (at 45%) this total was estimated to be 418,196 (Table 6.~~31~~45Table 6.~~31~~45). Alternatively, the biologically defined minimum population scale (BDMPS) estimated by Furness (2015) for the UK Western Waters (which includes the Irish Sea) was 801,556 (autumn and spring average). Adjusting this figure to incorporate colonies along the Irish coast of the Irish Sea (Table 12.12 Vol. 2 Offshore Ornithology EIAR) a revised figure of ~~818,181~~822,927 was obtained. Thus, the nonbreeding kittiwake population was estimated to lie within a range from 418,196 and ~~818,181~~822,927.

Table 6.~~31~~45: British and Irish kittiwake colonies associated with the Celtic Seas and Biscay nonbreeding region (as defined by Frederiksen et al., 2012) and estimated total nonbreeding population

County	Region	AON (Burnell *et al.* 2023)	Adults (AON x 2)	Immatures (@ 47%)	Total
Ireland	Antrim	16,202	32,404	28,736	61,140
Ireland	Down	656	1,312	1,163	2,475
Ireland	Dublin	5,713	11,426	10,132	21,558
Ireland	Wicklow	1,646	3,292	2,919	6,211
Ireland	Wexford	1,038	2,076	1,841	3,917
Ireland	Waterford	883	1,766	1,566	3,332
Ireland	Cork	1,579	3,158	2,800	5,958
Wales	West Glamorgan	101	202	179	381
Wales	Dyfed	2,155	4,310	3,822	8,132
Wales	Gwynedd	2,526	5,052	4,480	9,532
England	Lancashire	220	440	390	830
England	Cumbria	809	1,618	1,435	3,053
Isle of Man	-	685	1,370	1,215	2,585
England	Dorset	17	34	30	64
England	Cornwall	736	1,472	1,305	2,777
England	Devon	707	1,414	1,254	2,668
Scotland	Wigtown	444	888	787	1,675
Scotland	Ailsa Craig	490	980	869	1,849
Scotland	Sutherland	9,819	19,638	17,415	37,053
Scotland	Argyll and Bute	4,767	9,534	8,455	17,989
Scotland	Lochaber	2,145	4,290	3,804	8,094

County	Region	AON (Burnell *et al.* 2023)	Adults (AON x 2)	Immatures (@ 47%)	Total
Scotland	Skye and Lochalsh	1,327	2,654	2,354	5,008
Scotland	Western Isles	6,287	12,574	11,151	23,725
Total associated with Irish Sea colonies		60,952	121,904	108,104	230,008
Inc. Russia/Norway/North Sea (@45%)					418,196

6.8.1.15 The percentage of kittiwakes recorded within the Proposed Development predicted to originate from the Howth Head Coast SPA in the breeding season was 9.4% (Table 6.~~30~~44). As the collision predictions are derived from at sea survey data, they include all age classes so it is also necessary to estimate what portion of these are adults. Kittiwake populations consist of an estimated 53% adults, with the remaining 47% distributed among sub-adult age classes (Furness, 2015). Application of both the SPA percentage and the adult percentage to the total breeding season collision predictions indicates that 0.25 (Project Design Option 1a), 0.29 (Project Design Option 1b) and 0.28 (Project Design Option 2) collisions would be apportioned to adults from the SPA (Table 6.46).

6.8.1.16 ~~6.8.1.11~~ Of the total nonbreeding season collisions, the proportion originating from the Howth Head Coast SPA population was estimated to be between 0.43% and 0.85% (3,546 adults divided into ~~818,181~~822,927 and 418,196, respectively). Thus, ~~maximums of 1.4~~between 0.11 and 0.21 (Project Design Option 1a), ~~1.6~~0.12 and 0.24 (Project Design Option 1b) and ~~1.5~~0.12 and 0.23 (Project Design Option 2) of the nonbreeding collisions would be apportioned to the Howth Head Coast SPA (Table 6.46).

6.8.1.17 ~~6.8.1.12~~ Thus, summing the breeding season ~~(0.9, 1.0 and 0.9)~~ and nonbreeding ~~season (1.4, 1.6 and 1.5) collision estimates,~~seasons the maximum annual mortality for ~~Howth Head Coast SPA would be 2.3 (Project~~ Design Option 1a~~), 2.6 (Project Design Option 1b) and 2.4 (Project Design Option 2) adults~~ was between 0.4 and 0.5, for all Design Options.

Table 6.46: Kittiwake collisions and apportioned mortalities to the Howth Head Coast SPA. B=breeding, NB=nonbreeding.

Design Option	Total collisions		B apportioning (%)		NB Apportioning (%)		SPA collisions (B=Total B x SPA% x adult %) (NB= Total NB x SPA Low/High %)			
	B	NB	SPA	Adults	SPA Low estimate	SPA High estimate	B	NB		Total
								Low	High	
1a	5.0	25.3	9.4	53.0	0.43	0.85	0.25	0.11	0.21	**0.4-0.5**
1b	5.8	28.7			(=3546/ 822,927)	(=3546/ 418,196)	0.29	0.12	0.24	**0.4-0.5**
2	5.6	27.6					0.28	0.12	0.23	**0.4-0.5**

6.8.1.18 ~~6.8.1.13~~ The background adult mortality rate for kittiwake is 0.146 per annum (Horswill and Robinson 2015), which indicates that the natural mortality for the SPA population using the most recent count (1,773 AON, Cummins *et al.*, 2019) would be 518. Addition of ~~2.2, 2.6 or 2.4~~up to 0.5 adults to ~~these~~this would increase the background rate of the designated population by ~~0.44 to 0.50~~0.1%. The threshold below which increases in background mortality are considered to be undetectable against natural variations is 1% (Parker *et al.*, 2022).

6.8.1.19 Since the additional mortality based on a reasonable but precautionary assessment is far below the 1% threshold (in this case around ~~0.44 to 0.50~~0.1% rather than 1%), even if the impact was substantially greater than this (already precautionary) estimate, the impact would still most likely fall well below the 1% threshold, and so we can be confident that there is no reasonable scientific doubt as to the absence of an effect.

6.8.1.20 ~~6.8.1.14~~ **Therefore, on this basis there will be no AEoI on the kittiwake feature of Howth Head Coast SPA, as defined by the COs of the site, as a result of collision effects considered above, from Project Design Option 1.**

6.8.1.21 ~~6.8.1.15~~ **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

6.8.2 Ireland's Eye SPA

Kittiwake

6.8.2.1 The conservation objective for kittiwake in Ireland's Eye SPA can be found in Table 5.2.

6.8.2.2 See section 6.7.2.7 for a summary of relevant kittiwake ecology.

6.8.2.3 The only potential impacts are present within the operational and maintenance phase and so therefore the other phases of development are not considered within this qualifying features assessment.

6.8.2.4 The Ireland's Eye SPA population of kittiwake at designation was 941 AON which equates to a breeding adult population of 1,882. More recent surveys have reported 455 AON (Burnell *et al.*, 2023).

6.8.2.5 ~~Using the evidence-based rates~~As discussed in paragraphs 6.8.1.5 to 6.8.1.9, the total kittiwake breeding season collision ~~estimates~~estimate for Project Design Option 1a was ~~16.7~~estimated to be 5.0, for Project Design Option 1b was ~~18.8~~5.8 and for Project Design Option 2 was ~~16.8.~~5.6 (Appendix 12.05 Offshore Ornithology Technical Report – Collision Risk Modelling Results).

6.8.2.6 The total kittiwake nonbreeding season collision ~~estimates~~estimate for Project Design Option 1a was ~~170.1~~25.3, for Project Design Option 1b was ~~190.3~~28.7 and for Project Design Option 2 was ~~172.0~~27.6 (Appendix 12.5 Offshore Ornithology Technical Report – Collision Risk Modelling Results).

6.8.2.7 ~~6.8.2.6~~ The percentage of ~~kittiwake on~~kittiwakes recorded within the Proposed Development predicted to originate from the Ireland's Eye SPA in the breeding season was ~~2.4% (**Error! Unknown switch argument.**). Application of this rate to the total breeding season collision predictions indicated that 0.4 (Project Design Option 1a, Project Design Option 1b and Project Design Option 2) collisions would be apportioned to the SPA.~~

~~6.8.2.7~~2.1% (Table 6.~~30~~44). As the ~~As these~~ collision predictions are derived from at sea survey data, they include all age classes so it is also necessary to estimate what proportion of these are adults. Kittiwake populations consist of an estimated 53% adults, with the remaining 47% distributed among sub-adult age classes (Furness, 2015). ~~Thus, using these age class proportions the Ireland's Eye SPA adult collisions in the breeding season would be 0.2.~~Application of both the SPA percentage and the adult percentage to the total breeding season collision predictions

indicates that between 0.06 and 0.11 collisions would be apportioned to adults from the SPA for all Project Design Options (Table 6.47).

6.8.2.8 Of the total nonbreeding season ~~total kittiwake collision estimates, summing the autumn and spring BDMPS periods, were 170.1 (Project Design Option 1a), 190.3 (Project Design Option 1b) and 172.0 (Project Design Option 2).~~collisions, the proportion originating from the Ireland's Eye SPA population was estimated to be between 0.11% and 0.22% (910 adults divided into ~~818,181~~822,927 and 418,196~~; Table 6.3145~~, respectively). Thus, ~~a maximum of 0.4~~between 0.02 and 0.06 (Project Design Option 1a), 0.03 and 0.06 (Project Design Option 1b) and 0.03 and 0.06 (Project Design Option 2) of the nonbreeding collisions would be apportioned to the Ireland's Eye SPA (Table 6.47).

6.8.2.9 Thus, summing the breeding season ~~(0.2)~~ and nonbreeding ~~season (0.4) collision estimates, the~~seasons the maximum annual mortality ~~for Ireland's Eye SPA would be 0.6 adults (for all~~was 0.1 for all Design Options~~)~~.

Table 6.47: Kittiwake collisions and apportioned mortalities to the Ireland's Eye SPA. B=breeding, NB=nonbreeding.

Design option	Total collisions		B apportioning (%)		NB apportioning (%)		SPA collisions (B=Total B x SPA% x adult %) (NB= Total NB x SPA Low/High %)			
	B	NB	SPA	Adults	SPA Low estimate	SPA High estimate	B	NB		Total
								Low	High	
1a	5.0	25.3	2.1	53.0	0.11	0.22	0.06	0.03	0.06	**0.1-0.1**
1b	5.8	28.7			(=910/ 822,927)	(=910/ 418,196)	0.06	0.03	0.06	**0.1-0.1**
2	5.6	27.6					0.06	0.03	0.06	**0.1-0.1**

6.8.2.10 The background adult mortality rate for kittiwake is 0.146 per annum (Horswill and Robinson 2015), which indicates that the natural mortality for the SPA population using the most recent count (~~455~~910 AON, Cummins *et al.*, 2019) would be 133. Addition of ~~0.6~~0.1 adults to ~~these~~this would increase the background mortality rate of the designated population by ~~0.42 to 0.46~~0.07%. The threshold below which increases in background mortality are considered to be undetectable against natural variations is 1% (Parker *et al.*, 2022).

6.8.2.11 Since the additional mortality based on a reasonable but precautionary assessment is far below the 1% threshold, even if the impact was substantially greater than this (already precautionary) estimate, the impact would still most likely fall well below the 1% threshold, and so we can be confident that there is no reasonable scientific doubt as to the absence of an effect.

6.8.2.12 ~~6.8.2.11~~ **Therefore, on this basis there will be no AEoI on the kittiwake feature of Ireland's Eye SPA, as defined by the COs of the site, as a result of collision effects considered above, from Project Design Option 1.**

6.8.2.13 ~~6.8.2.12~~ **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

Herring gull

6.8.2.14 ~~6.8.2.13~~ The conservation objective for herring gull in Ireland's Eye SPA can be found in Table 5.2.

6.8.2.15 ~~6.8.2.14~~ See section 6.7.2.14 for a summary of relevant herring gull ecology.

6.8.2.16 ~~6.8.2.15~~ The only potential impacts are present within the operational and maintenance phase and so therefore the other phases of development are not considered within this qualifying features assessment.

6.8.2.17 ~~6.8.2.16~~ The Ireland's Eye SPA population of herring gull at designation was 250 pairs which equates to a breeding adult population of 500. More recent surveys have reported 318 AON (Burnell et al., 2023).

6.8.2.18 ~~6.8.2.17~~ Herring gull collisions were only predicted to occur in ~~two~~five months, February, March, April, August and November, with none in the core breeding season months (May – July), therefore there is no breeding season connectivity of relevance between the Ireland's Eye SPA and the Proposed Development.

6.8.2.19 ~~6.8.2.18~~ The total nonbreeding season collisions (i.e. not apportioned among SPA colonies) was ~~1.3~~2.6 (Project Design Option 1a), ~~1.5~~2.9 (Project Design Option 1b) and ~~1.3~~2.8 (Project Design Option 2). The most recent estimate of the herring gull population from Northern Irish and Irish colonies with connectivity to the Irish Sea (from Antrim to Waterford) is 8,635 AON (Burnell et al. 2023). Birds from Ireland's Eye SPA would make up 3.7% of this population, therefore 3.7% of the total collisions would equate to ~~0.05~~no more than 0.1 individuals. The adult mortality rate for herring gull is 0.166 (Horswill and Robinson 2015).

6.8.2.20 The background mortality of herring gull from Ireland's Eye SPA would therefore be 105 individuals. Addition of the apportioned mortality to this would increase the rate by ~~0.05~~0.1% which would be undetectable against background variations (Parker et al. 2022).

6.8.2.21 Since the additional mortality based on a reasonable but precautionary assessment is far below the 1% threshold, even if the impact was substantially greater than this (already precautionary) estimate, the impact would still most likely fall well below the 1% threshold, and so we can be confident that there is no reasonable scientific doubt as to the absence of an effect.

6.8.2.22 ~~6.8.2.19~~ **Therefore, on this basis there will be no AEoI on the herring gull feature of Ireland's Eye SPA, as defined by the COs of the site, as a result of collision effects considered above, from Project Design Option 1.**

6.8.2.23 ~~6.8.2.20~~ **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

Guillemot

6.8.2.24 ~~6.8.2.21~~ The conservation objective for guillemot in Ireland's Eye SPA can be found in Table 5.2.

6.8.2.25 ~~6.8.2.22~~ See section 6.7.2.16 for a summary of relevant guillemot ecology.

6.8.2.26 ~~6.8.2.23~~ The Ireland's Eye SPA population of guillemots at designation was 2,191 individuals. More recent surveys have reported 4,410 (Burnell et al., 2023).

6.8.2.27 ~~6.8.2.24~~ Guillemots fly close to the sea surface and are therefore at very low risk of collisions. However, there is evidence that guillemots may have lower densities within windfarms than outside, and therefore some displacement appears to occur (Dierschke et al., 2016). It is not clear to what extent this may affect individuals or populations, since this depends on the importance of the site (e.g. habitat quality) and the extent of alternative suitable habitat. The approach to estimating displacement impacts for UK offshore windfarms is based on a matrix formulation, with estimates of the percentage of birds predicted to be displaced on one axis and the percentage which may suffer consequent mortality on the other. Natural England and NatureScot differ in the predicted rates of displacement and mortality recommended for assessing potential impacts on auks. Natural England assume there would be 100% displacement of auks within the 2 km buffer surrounding the cable laying vessel combined with consequent mortalities for displaced birds between 1% and 10%. In contrast, NatureScot, with respect to displacement from Array Areas, recommend an auk displacement rate of 60% and consequent mortality (for displaced individuals)

of 1-3% in the nonbreeding season and 3-5% in the breeding season. MacArthur Green (2019) undertook a review of available evidence for auk displacement which concluded that precautionary rates of displacement and mortality from operational windfarms would be 50% and 1% respectively. These figures are also considered suitably precautionary for the potential displacement around construction vessels. Therefore, the assessment presents estimates using a 60% displacement rate and a 1% mortality rate in order to ensure the assessment conclusions are conservative in this regard. The guillemot breeding season was defined as April to August, with all other months treated as nonbreeding.

6.8.2.28 ~~6.8.2.25~~ There are three SPAs within the mean maximum foraging range of the Proposed Development; Ireland's Eye, Lambay Island and Saltee Islands, and small numbers of guillemots breed at some non-SPA colonies. The relative contribution from each main colony to the breeding season population on the Proposed Development was estimated using the NatureScot apportioning ~~method1~~ (Table 6.~~32~~48~~method~~[7] (Table 6.~~32~~48). It should be noted that although the Wicklow Head, Bray Head and Howth Head population ~~has~~have been included in this table, ~~this population is~~guillemot are not a designated feature of these sites and therefore is not assessed in this NIS. However, ~~it has~~they have been included in order that impacts on the SPA populations are not over-estimated. This apportioning could potentially include other non-SPA populations of guillemot therefore the current estimates are considered precautionary as they may over-estimate the contributions from SPA populations.

Table 6.~~32~~48: Estimated proportions of guillemot from colonies with potential connectivity to the Proposed Development. SPA colonies assessed are highlighted in bold

Colony	Distance to Proposed Development (SPA edge to Proposed Development midpoint, km)	Colony size (Individuals)	Estimated sea proportion	Calculated colony weight	Apportioned Colony percentage
Lambay SPA	**77**	**59,983**	**0.55**	~~0.55~~**0.46**	~~64.6~~**60.8**
Ireland's eye SPA	**68**	**4,410**	**0.55**	~~0.05~~**0.04**	~~6.1~~**5.7**
Wicklow Head SPA	19	737	0.5	~~0.12~~0.10	~~14.3~~13.5
Saltee Islands SPA	**93**	**25,851**	**0.7**	~~0.13~~**0.11**	~~15.0~~**14.1**
Bray Head	44	1,414	0.55	0.03	4.4
Howth Head	64	871	0.5	0.01	1.4

6.8.2.29 ~~6.8.2.26~~ On the basis of the apportioning, ~~6.1~~5.7% of the adult guillemots recorded on the Proposed Development in the breeding season would be predicted to originate from Ireland's Eye SPA.

CONSTRUCTION

6.8.2.30 ~~6.8.2.27~~ In order to calculate the number of guillemots that potentially would be at risk of displacement from the Cable Corridor and Working Area during the cable laying process, the density of this species in the Cable Corridor and Working Area (corridor 1 and corridor 2) was estimated from the site-specific surveys carried out for the Proposed Development (NIS Volume

III, Appendix 12.1: Offshore Ornithology Technical ~~Rep-rt~~Report – Overview (Revised March 2026)).

6.8.2.31 ~~6.8.2.28~~ During the breeding season (March to July), the seasonal peak density in corridor 1 was ~~2.9~~15.2 birds/ km^2 and in corridor 2 was ~~3.3~~10.5 birds/ km^2. Within a 2 km radius of disturbance around a cable laying vessel (12.56 km^2), ~~22~~114 individuals (~~2.9~~15.2 x 12.56 x 60%) could be at risk of displacement along corridor 1 and ~~25~~79 (~~3.3~~10.53 x 12.56 x 60%) along corridor 2, ~~47~~193 in total. This means that, across all populations, ~~0.47~~1.93 individuals (1%) would be at risk of mortality due to cable installation, of which ~~6.1% (0.03~~5.7% (0.11 individuals) would be at risk from Ireland's Eye SPA.

6.8.2.32 ~~6.8.2.29~~ During the nonbreeding season (August to February), the seasonal peak density in corridor 1 was ~~27.3~~25.4 birds/ km^2 and in corridor 2 was ~~12.6~~12.2 birds/ km^2. Within a 2 km radius of disturbance around a cable laying vessel (12.56 km^2), ~~206~~191 individuals (~~27.3~~25.4 x 12.56 x 60%) could be at risk of displacement along corridor 1 and ~~95~~92 (~~12.6~~12.2 x 12.56 x 60%) along corridor 2, ~~301~~283 in total. This means that, across all populations, ~~3~~2.83 individuals (1%) would be at risk of mortality due to cable installation.

6.8.2.33 ~~6.8.2.30~~ During the nonbreeding season, guillemots disperse from their colonies to overwintering areas. Thus, a considerable number of birds from colonies around the Irish Sea will pass through, or be present in, the Irish Sea. Using just the colony estimates from the last comprehensive survey (Burnell et al. 2023), the total population with high connectivity to the Irish Sea was estimated as 563,371 (Table 6.~~33~~49Table 6.~~33~~49). Alternatively, the biologically defined minimum population scale (BDMPS) estimated by Furness (2015) for the UK Western Waters (which includes the Irish Sea) was 1,139,220. Adjusting this figure to incorporate colonies along the Irish coast of the Irish Sea a revised figure of 1,567,463 was obtained. Thus, the nonbreeding guillemot population was estimated to lie within a range from 563,371 and 1,567,463.

Table 6.~~33~~49: British and Irish guillemot colonies associated with the Irish Sea nonbreeding region and estimated total nonbreeding population

County	Region	Adults	Immatures (@ 43%)	Total
Ireland	Antrim	155,890	67,033	222,923
Ireland	Dublin	65,264	28,064	93,328
Ireland	Wicklow	2,150	925	3,075
Ireland	Wexford	25,851	11,116	36,967
Ireland	Waterford	1,595	686	2,281
Ireland	Cork	6,413	2,758	9,171
Wales	West Glamorgan	169	73	242
Wales	Dyfed	68,574	29,487	98,061
Wales	Gwynedd	35,994	15,477	51,471
England	Cumbria	17,501	7,525	25,026
Isle of Man	-	5,219	2,244	7,463
Scotland	Wigtown	2,206	949	3,155
Scotland	Ailsa Craig	7,140	3,070	10,210

County	Region	Adults	Immatures (@ 43%)	Total
Total associated with Irish Sea colonies		393,966	169,405	563,371

6.8.2.34 ~~6.8.2.31~~ Of the total nonbreeding season mortalities, the proportion originating from the Ireland's Eye SPA population was estimated to be between 0.28% and 0.78% (4,410 adults divided into 1,567,463 and 563,371). Thus, a maximum of 0.02 of the nonbreeding construction displacement mortalities would be apportioned to the Ireland's Eye SPA.

6.8.2.35 ~~6.8.2.32~~ Thus, summing the breeding season (~~0.03~~0.11) and nonbreeding season (0.02) construction displacement mortalities, the potential annual mortality on the Ireland's Eye SPA guillemot population would be ~~0.05~~0.13 adults.

6.8.2.36 ~~6.8.2.33~~ The background adult mortality rate for guillemot is 0.061 (Horswill and Robinson, 2015), which indicates that the natural mortality for this SPA population would be 269 individuals (4,410 x 0.061). Addition of a maximum of 0.05 individuals to this would increase the background rate by ~~0.02~~0.05%. This is a very small increase and would be undetectable against natural variations. The threshold below which increases in background mortality are considered to be undetectable against natural variations is 1% (Parker et al. 2022).

6.8.2.37 Since the additional mortality based on a reasonable but precautionary assessment is far below the 1% threshold, even if the impact was substantially greater than this (already precautionary) estimate, the impact would still most likely fall well below the 1% threshold, and so we can be confident that there is no reasonable scientific doubt as to the absence of an effect.

6.8.2.38 ~~6.8.2.34~~ **Therefore, on this basis there will be no AEoI on the guillemot feature of Ireland's Eye SPA, as defined by the COs of the site, as a result of construction displacement effects considered above, from Project Design Option 1.**

6.8.2.39 ~~6.8.2.35~~ **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

OPERATIONAL

6.8.2.40 ~~6.8.2.36~~ The assumption for guillemots is that displacement from windfarms occurs at a constant level to a distance of 2 km in line with guidance (SNCBs 2022) and that within this area, ~~30% to 70~~following NatureScot guidance, 60% of birds will be displaced ~~and~~of which mortality ~~of displaced birds will~~would be between 3% and 5% in the breeding season and between 1% and ~~10~~3% in the non-breeding seasons.

6.8.2.41 ~~6.8.2.37~~ Empirical evidence indicates that auk (guillemots and razorbills) displacement from windfarms is likely to be lower than ~~70~~60%, although pre- and post-construction monitoring data have yielded variable results. Auks may be displaced to some extent by some windfarms, although displacement is partial and apparently negligible in some sites (Dierschke et al., 2016). Several studies have reported displacement: guillemots were displaced at Blighbank (Vanermen et al., 2012) and German offshore windfarms (Peschko et al. 2020, 2024), were displaced only in a minority of surveys at two Dutch windfarms (OWEZ and Princess Amalia Windpark (PAWP); Leopold et al., 2011; Krijgsveld et al., 2011), and were not significantly displaced at Horns Rev (although the data suggest that slight displacement was probably occurring; Petersen et al., 2007) or Thornton Bank (Vanermen et al., 2012). However, while at least some of these studies have recorded changes in abundance and reported these as displacement, these results should be treated with caution due to limits on their power to distinguish natural inter-annual variation from windfarm effects, as noted in recent re-evaluation of some of these studies (Zuur 2018). In a bespoke study, designed to estimate displacement distances in breeding seabirds, conducted at an operational offshore wind farm in Scotland, Trinder et al. (2024) found no evidence that

guillemot avoided turbines, with no apparent variation in densities within the wind farm irrespective of distance to turbines.

6.8.2.42 ~~6.8.2.38~~ The ~~10~~maximum 5% mortality rate for auks is unconfirmed and this magnitude of impact is not supported in the literature. Given that this ~~exceeds~~is approximately the same level as the existing natural adult annual mortality for guillemot from all other sources of mortality (baseline mortality is 6.1%; Horswill and Robinson 2015), it is highly improbable that such an effect would occur. Mortality due to displacement might arise if displacement increased competition for resources in the remaining areas of auk habitat outside the windfarm. However, it should be recognised that the mortality rate due to displacement may well be 0% since the increase in density of auks outside the windfarm area will be negligible (because the rest of the available habitat is vast) and is very unlikely to be as high as ~~10~~5%.

6.8.2.43 ~~6.8.2.39~~ MacArthur Green (2019) undertook a review of available evidence for auk displacement and concluded that precautionary rates of displacement and mortality from operational windfarms would be 50% and 1% respectively. Thus, this assessment presents displacement in the range from ~~30~~50% displaced and 1% mortality to ~~70~~60% displaced and ~~10~~3% - 5% mortality (breeding season) and 1% - 3% mortality (non-breading season), with a focus on the evidence-based rates of 50% displaced and 1% mortality.

6.8.2.44 ~~6.8.2.40~~ During the breeding season (March to July), the seasonal peak abundance in the Array Area and 2 km buffer was ~~3,033~~9,010 birds. Thus, in total, between ~~9~~162 (~~30~~60% displaced and ~~1~~3% mortality) and ~~212~~270 (~~70~~60% displaced, ~~10~~5% mortality) could be at risk of displacement mortality, with the evidence-based prediction of ~~15~~45 (50% displaced and 1% mortality). Of these, ~~6.1% (**Error! Unknown switch argument.**) which equate to 0.55, 0.91 and 13 individuals at the respective rates,~~57% would be adults (Furness, 2015) and 5.7% would be at risk from ~~Ireland's Eye SPA~~Irelands Eye SPA (Table 6.~~33~~48), which combined equate to 1.46, 5.23 and 8.77 individual adults from the SPA at the respective rates (50x1, 60x3 and 60x5).

6.8.2.45 ~~6.8.2.41~~ During the nonbreeding season (August to February), the seasonal peak abundance in the Array Area and 2 km buffer was ~~5,079~~3,991 birds. Thus, in total, between ~~15~~24 (~~30~~60% displaced and 1% mortality) and ~~356~~72 (~~70~~60% displaced, ~~10~~30% mortality) could be at risk of displacement mortality, with the evidence-based prediction of ~~25~~20 (50% displaced and 1% mortality). Of these, 0.028% to 0.78% ~~(~~Table 6.~~33~~49~~) which equate to maximums of 0.1, 0.2 and 2.8 individuals at the respective rates,~~ would be adults at risk from Ireland's Eye SPA (Table 6.~~33~~49) which equate to maximums of 0.16, 0.19 and 0.56 individuals at the respective rates.

6.8.2.46 ~~6.8.2.42~~ Thus, summing the breeding season (~~0.5~~1.46, ~~0.9~~5.23, ~~13~~8.77) and nonbreeding season (~~0.1~~0.16, ~~0.2~~0.19, ~~2.8~~0.56) operational displacement mortalities, the potential annual mortality on the Ireland's Eye SPA guillemot population would be ~~0.65~~1.62, ~~1.1~~5.41 and ~~15.8~~9.33 adults, respectively.

6.8.2.47 ~~6.8.2.43~~ The background adult mortality rate for guillemot is 0.061 (Horswill and Robinson, 2015), which indicates that the natural mortality for this SPA population would be 269 individuals (4,410 x 0.061). Addition of individuals subject to displacement mortality would increase the background rate by ~~0.2~~0.6%, ~~0.4~~2.0% and ~~5.8~~3.5%. While the most precautionary displacement rates (60% displaced and 3-5% mortality) result in an increase in background mortality above the 1% threshold of detectability (Parker et al. 2022), this is not the case at the evidence-based rates (50% displaced and 1% mortality). Since the additional mortality based on a reasonable but precautionary assessment is far below the 1% threshold, even if the impact was substantially greater than this (already precautionary) estimate, the impact would still most likely fall well below the 1% threshold, and so we can be confident that there is no reasonable scientific doubt as to the absence of an effect.

6.8.2.48 ~~6.8.2.44~~ **Therefore, on this basis there will be no AEoI on the guillemot feature of Ireland's Eye SPA, as defined by the COs of the site, as a result of operational displacement effects considered above, from Project Design Option 1.**

6.8.2.49 ~~6.8.2.45~~ **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

Razorbill

6.8.2.50 ~~6.8.2.46~~ The conservation objective for razorbill in Ireland's Eye SPA can be found in Table 5.2.

6.8.2.51 ~~6.8.2.47~~ See section 6.7.2.18 for a summary of relevant razorbill ecology.

6.8.2.52 ~~6.8.2.48~~ The Ireland's Eye SPA population of razorbill at designation was 522 individuals. More recent surveys have reported 1,600 (Burnell et al., 2023).

6.8.2.53 ~~6.8.2.49~~ Razorbills fly close to the sea surface and are therefore at very low risk of collisions. However, there is evidence that razorbills may have lower densities within windfarms than outside, and therefore some displacement appears to occur (Dierschke et al., 2016). It is not clear to what extent this may affect individuals or populations, since this depends on the importance of the site (e.g. habitat quality) and the extent of alternative suitable habitat. The approach to estimating displacement impacts for UK offshore windfarms is based on a matrix formulation, with estimates of the percentage of birds predicted to be displaced on one axis and the percentage which may suffer consequent mortality on the other. Natural England and NatureScot differ in the predicted rates of displacement and mortality recommended for assessing potential impacts on auks. Natural England assume there would be 100% displacement of auks within the 2 km buffer surrounding the cable laying vessel combined with consequent mortalities for displaced birds between 1% and 10%. In contrast, NatureScot, with respect to displacement from Array Areas, recommend an auk displacement rate of 60% and consequent mortality (for displaced individuals) of 1-3% in the nonbreeding season and 3-5% in the breeding season. MacArthur Green (2019) undertook a review of available evidence for auk displacement which concluded that precautionary rates of displacement and mortality from operational windfarms would be 50% and 1% respectively. These figures are also considered suitably precautionary for the potential displacement around construction vessels. Therefore, the assessment presents estimates using a 60% displacement rate and a 1% mortality rate in order to ensure the assessment conclusions are conservative in this regard. The razorbill breeding season was defined as April to July, autumn migration is defined as August to October, winter as November and December and spring migration as January to March.

6.8.2.54 ~~6.8.2.50~~ There are three SPAs within the mean maximum foraging range of the Proposed Development; Ireland's Eye, Lambay Island and Saltee Islands, and small numbers of razorbills breeding at some non-SPA colonies. The relative contribution from each main colony to the breeding season population on the Proposed Development was estimated using the NatureScot apportioning method~~1~~[7] (~~**Error! Unknown switch argument.**~~Table 6.3450). It should be noted that although the Wicklow Head population has been included in this table, this population is not a designated feature and therefore is not assessed in this NIS. However, it has been included in order that impacts on the SPA populations are not over-estimated. This apportioning could potentially include other non-SPA populations of razorbill therefore the current estimates are considered precautionary as they may over-estimate the contributions from SPA populations.

Table 6.~~34~~50: Estimated proportions of razorbill from colonies with potential connectivity to the Proposed Development. SPA colonies assessed are highlighted in bold

Colony	Distance to Proposed Development (SPA edge to Proposed	Colony size (Individuals)	Estimated sea proportion	Calculated colony weight	Apportioned Colony percentage

	Development midpoint, km)				
Lambay SPA	**77**	**7,353**	**0.55**	~~0.71~~**0.34**	~~45.3~~**34.9**
Ireland's Eye SPA	**68**	**1,600**	**0.55**	~~0.20~~**0.10**	~~12.6~~**9.7**
Wicklow Head SPA	19	184	0.5	~~0.32~~0.15	~~20.5~~15.8
Saltee Islands SPA	**93**	**6,519**	**0.7**	~~0.34~~**0.16**	~~21.6~~**16.7**
Bardsey Island	80	3834	0.72	0.13	12.9
Bray Head	44	150	0.54	0.02	2.2
Howth	64	279	0.53	0.02	2.0
South Stack Cliffs	84	1378	0.81	0.04	3.7
Carreg y Llam	93	438	0.68	0.01	1.2
Lleyn Peninsula	83	292	0.7	0.01	0.9

6.8.2.55 ~~6.8.2.51~~ On the basis of the apportioning, ~~12.6~~9.7% of the adult razorbills recorded on the Proposed Development in the breeding season would be predicted to originate from Ireland's Eye SPA.

6.8.2.56 ~~6.8.2.52~~ During the nonbreeding seasons, razorbills disperse from their colonies to overwintering areas. Thus, a considerable number of birds from colonies around the Irish Sea will pass through, or be present in, the Irish Sea. Using the colony estimates from the last comprehensive survey (Burnell et al. 2023), the total population with high connectivity to the Irish Sea was estimated as 96,268 (Table 6.~~35~~51Table 6.~~35~~51). Alternatively, the biologically defined minimum population scale (BDMPS) estimated by Furness (2015) for the UK Western Waters (which includes the Irish Sea) was 518,417 (autumn, winter and spring average). Adjusting this figure to incorporate colonies along the Irish coast of the Irish Sea a revised figure of 554,179 was obtained. Thus, the nonbreeding razorbill population was estimated to lie within a range from 96,268 and 554,179.

Table 6.~~35~~51: British and Irish razorbill colonies associated with the Irish Sea nonbreeding region and estimated total nonbreeding population

County	Region	Adults	Immatures (@ 43%)	Total
Ireland	Antrim	24,730	10,634	35,364
Ireland	Dublin	9,232	3,970	13,202
Ireland	Wicklow	184	79	263
Ireland	Wexford	6,519	2,803	9,322
Ireland	Waterford	294	126	420
Ireland	Cork	571	246	817

County	Region	Adults	Immatures (@ 43%)	Total
Wales	West Glamorgan	83	36	119
Wales	Dyfed	18,090	7,779	25,869
Wales	Gwynedd	5,467	2,351	7,818
England	Cumbria	94	40	134
Isle of Man	-	626	269	895
Scotland	Wigtown	269	116	385
Scotland	Ailsa Craig	1,161	499	1,660
Total associated with Irish Sea colonies		67,320	28,948	96,268

CONSTRUCTION

6.8.2.57 ~~6.8.2.53~~ In order to calculate the number of razorbills that potentially would be at risk of displacement from the Cable Corridor and Working Area during the cable laying process, the density of this species in the Cable Corridor and Working Area (corridor 1 and corridor 2) was estimated from the site-specific surveys carried out for the Proposed Development (NIS Volume III, Appendix 12.1: Offshore Ornithology Technical Report – Overview (Revised March 2026)).

6.8.2.58 ~~6.8.2.54~~ During the breeding season (April to July), the seasonal peak density in corridor 1 was ~~0.3~~1.24 birds/ km^2 and in corridor 2 was ~~0.3~~0.51 birds/ km^2. Within a 2 km radius of disturbance around a cable laying vessel (12.56 km^2), ~~2~~9.3 individuals (~~0.3~~1.24 x 12.56 x 60%) could be at risk of displacement along corridor 1 and ~~2~~3.8 (0.3 x 12.56 x 60%) along corridor 2, ~~4~~13.1 in total. This means that, across all populations, ~~0.04~~0.13 individuals (1%) would be at risk of mortality due to cable installation, of which ~~12.6% (0.005~~9.7% (0.013 individuals) would be at risk from Ireland's Eye SPA.

6.8.2.59 ~~6.8.2.55~~ During autumn migration (August to October), at a seasonal peak density of ~~3.2~~2.173 birds/ km^2 (corridor 1) and ~~4.5~~2.69 birds/ km^2 (corridor 2), with a 2 km radius of disturbance around a cable laying vessel (12.56 km^2), a maximum of ~~48~~16.3 individuals (~~3.2~~2.17 x 12.56 x 60%) could be at risk of displacement along corridor 1 and ~~34~~20.34 (~~4.5~~2.69 x 12.56 x 60%) along corridor 2, ~~82~~36.6 in total. This means that ~~0.82~~0.37 individuals (1%) are at risk of mortality due to cable installation.

6.8.2.60 ~~6.8.2.56~~ During the winter period (November and December), at a seasonal peak density of ~~9.5~~8.2 birds/ km^2 (corridor 1) and ~~5.0~~4.9 birds/ km^2 (corridor 2), with a 2 km radius of disturbance around a cable laying vessel (12.56 km^2), a maximum of ~~72~~61.8 individuals (~~9.5~~8.2 x 12.56 x 60%) could be at risk of displacement along corridor 1 and ~~38~~36.9 (~~5.0~~4.95 x 12.56 x 60%) along corridor 2, ~~110~~98.7 in total. This means that ~~1.1~~1.0 individuals (1%) are at risk of mortality due to cable installation.

6.8.2.61 ~~6.8.2.57~~ During the spring migration (January to March), at a seasonal peak density of ~~0.7~~0.66 birds/ km^2 (corridor 1) and ~~0.3~~1.8 birds/ km^2 (corridor 2), with a 2 km radius of disturbance around a cable laying vessel (12.56 km^2), a maximum of ~~five~~5 individuals (~~0.7~~0.66 x 12.56 x 60%) could be at risk of displacement along corridor 1 and ~~two~~13.5 (0.3 x 12.56 x 60%) along corridor 2, ~~seven~~18.5 in total. This means that ~~0.07~~0.18 individuals (1%) are at risk of mortality due to cable installation.

6.8.2.62 ~~6.8.2.58~~ Of the total autumn, winter and spring mortalities, the proportion originating from the Ireland's Eye SPA population was estimated to be between 0.29 and 1.66% (1,600 adults divided into 554,179 and 96,268). Thus, of the total nonbreeding construction displacement mortality ~~2.0~~of 1.6 (~~0.82~~0.37, ~~1.1~~1.0, ~~0.07~~0.18), a maximum of 0.03 of the nonbreeding mortalities would be apportioned to the Ireland's Eye SPA.

6.8.2.63 ~~6.8.2.59~~ Thus, summing the breeding season (~~0.005~~0.013) and nonbreeding season (0.03) construction displacement mortalities, the potential annual mortality on the Ireland's Eye SPA razorbill population would be ~~0.035~~0.043 adults.

6.8.2.64 ~~6.8.2.60~~ The background adult mortality rate for razorbill is 0.105 (Horswill and Robinson, 2015), which indicates that the natural mortality for this SPA population would be 168 individuals (1,600 x 0.105). Addition of a maximum of ~~0.035~~0.043 individuals to this would increase the background rate by 0.02%. This is a very small increase and would be undetectable against natural variations. The threshold below which increases in background mortality are considered to be undetectable against natural variations is 1% (Parker et al. 2022).

6.8.2.65 Since the additional mortality based on a reasonable but precautionary assessment is far below the 1% threshold, even if the impact was substantially greater than this (already precautionary) estimate, the impact would still most likely fall well below the 1% threshold, and so we can be confident that there is no reasonable scientific doubt as to the absence of an effect.

6.8.2.66 ~~6.8.2.61~~ **Therefore, on this basis there will be no AEoI on the razorbill feature of Ireland's Eye SPA, as defined by the COs of the site, as a result of construction displacement effects considered above, from Project Design Option 1.**

6.8.2.67 ~~6.8.2.62~~ **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

OPERATIONAL

6.8.2.68 ~~6.8.2.63~~ The assumption for razorbills is that displacement from windfarms occurs at a constant level to a distance of 2 km in line with guidance (SNCBs 2022) and that within this area, ~~30% to 70~~following NatureScot guidance, 60% of birds will be displaced ~~and~~of which mortality ~~of displaced birds will~~would be between 3% and 5% in the breeding season and between 1% and ~~10~~3% in the nonbreeding seasons.

6.8.2.69 ~~6.8.2.64~~ Empirical evidence indicates that auk (guillemot and razorbill) displacement from windfarms is likely to be lower than ~~70~~60%, although pre- and post-construction monitoring data have yielded variable results (see Section ~~6.8.2.41~~6.8.2.41 for a discussion).

6.8.2.70 ~~6.8.2.65~~ The ~~10~~maximum 5% mortality rate for auks is unconfirmed and this magnitude of impact is not supported in the literature. Given that this is equivalent to half of the existing natural adult annual mortality for razorbill from all other sources of mortality (baseline mortality is 10.5%; Horswill and Robinson 2015), it is highly improbable that such an effect would occur. Mortality due to displacement might arise if displacement increased competition for resources in the remaining areas of auk habitat outside the windfarm. However, it should be recognised that the mortality rate due to displacement may well be 0% since the increase in density of auks outside the windfarm area will be negligible (because the rest of the available habitat is vast) and is very unlikely to be as high as ~~10~~5%.

6.8.2.71 ~~6.8.2.66~~ MacArthur Green (2019) undertook a review of available evidence for auk displacement and concluded that precautionary rates of displacement and mortality from operational windfarms would be 50% and 1% respectively. Thus, this assessment presents displacement in the range from ~~30~~50% displaced and 1% mortality to ~~70~~60% displaced and ~~10~~3%-5%mortality breeding season) and 1%-3% mortality (nonbreeding seasons), with a focus on the evidence-based rates of 50% displaced and 1% mortality.

6.8.2.72 ~~6.8.2.67~~ During the breeding season (April to July), the seasonal peak abundance in the Array Area and 2 km buffer was ~~211~~488 birds. Thus, in total, between ~~1~~8.8 (~~30~~60% displaced and ~~1~~3% mortality) and ~~15~~14.6 (~~70~~60% displaced, ~~10~~5% mortality) could be at risk of displacement mortality, with the evidence-based prediction of ~~1~~2.4 (50% displaced and 1% mortality). Of these, ~~12.6% (**Error! Unknown switch argument.**) which equate to 0.01, 0.01 and 0.19 individuals at the respective rates,~~57% would be adults (Furness, 2015) and 9.7% would be at risk from Ireland's Eye SPA (Table 6.3450) which combined equate to 0.13, 0.49 and 0.81 individuals at the respective rates (60% and 3%, 60% and 5% and 50% and 1%).

6.8.2.73 ~~6.8.2.68~~ During the autumn season (August to October), the seasonal peak abundance in the Array Area and 2 km buffer was ~~2,319~~2,570 birds. Thus, in total, between ~~7~~15.4 (~~30~~60% displaced and 1% mortality) and ~~162~~46.3 (~~70~~60% displaced, ~~10~~3% mortality) could be at risk of displacement mortality, with the evidence-based prediction of ~~12~~12.8 (50% displaced and 1% mortality).

6.8.2.74 ~~6.8.2.69~~ During the winter (November and December), the seasonal peak abundance in the Array Area and 2 km buffer was ~~2,072~~2,558 birds. Thus, in total, between ~~6~~15.36 (~~30~~60% displaced and 1% mortality) and ~~145~~46.0 (~~70~~60% displaced, ~~10~~3% mortality) could be at risk of displacement mortality, with the evidence-based prediction of ~~10~~12.8 (50% displaced and 1% mortality).

6.8.2.75 ~~6.8.2.70~~ During the spring season (January to March), the seasonal peak abundance in the Array Area and 2 km buffer was 3,711 birds. Thus, in total, between ~~11~~22 (~~30~~60% displaced and 1% mortality) and ~~260~~66.8 (~~70~~60% displaced, ~~10~~3% mortality) could be at risk of displacement mortality, with the evidence based prediction of ~~19~~18.6 (50% displaced and 1% mortality).

6.8.2.76 ~~6.8.2.71~~ Of the total autumn, winter and spring mortalities, the proportion originating from the Ireland's Eye SPA population was estimated to be between 0.29 and 1.66% (1,600 adults divided into 554,179 and 96,268). Thus, of the total nonbreeding operational displacement mortality of ~~24~~44.2**,** ~~41~~52.7 and ~~567~~159.1 (at each combination of rates respectively), maximums of between ~~0.4~~0.74 (~~24~~44.2 x 1.66%) and ~~9.4~~2.6 (~~567~~159.1 x 1.66%) of the nonbreeding mortalities would be apportioned to the Ireland's Eye SPA.

6.8.2.77 ~~6.8.2.72~~ Thus, ~~with the addition of~~summing the breeding season mortality (0.13, 0.49 and 0.81) and the nonbreeding season mortality (0.7, 0.87 and 2.6) the annual mortality on the Ireland's Eye SPA razorbill population would be ~~between 0.4 and 9.6, with the evidence-based estimate of 0.7~~0.2, 1.36 and 3.41 adults respectively.

6.8.2.78 ~~6.8.2.73~~ The background adult mortality rate for razorbill is 0.105 (Horswill and Robinson, 2015), which indicates that the natural mortality for this SPA population would be 168 individuals (1,600 x 0.105). Addition of individuals subject to displacement mortality would increase the background rate by ~~0.2~~0.11%, ~~0.4~~0.81% and ~~5.6~~2.0%. While the most precautionary displacement rates result in an increase in background mortality above the 1% threshold of detectability (Parker et al. 2022), this is not the case at the evidence-based rates (50% displaced and 1% mortality). Since the additional mortality based on a reasonable but precautionary assessment is far below the 1% threshold, even if the impact was substantially greater than this (already precautionary) estimate, the impact would still most likely fall well below the 1% threshold, and so we can be confident that there is no reasonable scientific doubt as to the absence of an effect.

6.8.2.79 ~~6.8.2.74~~ **Therefore, on this basis there will be no AEoI on the razorbill feature of Ireland's Eye SPA, as defined by the COs of the site, as a result of operational displacement effects considered above, from Project Design Option 1.**

6.8.2.80 ~~6.8.2.75~~ **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

6.8.3 Lambay Island SPA

Kittiwake

6.8.3.1 The conservation objective for kittiwake in Lambay Island SPA can be found in Table 5.2.

6.8.3.2 See section 6.7.2.7 for a summary of relevant kittiwake ecology.

6.8.3.3 The only potential impacts are present within the operational and maintenance phase and so therefore the other phases of development are not considered within this qualifying features assessment.

6.8.3.4 The Lambay Island SPA population of kittiwake at designation was 4,091 AON which equates to a breeding adult population of 8,182. More recent surveys have reported 3,320 AON (Burnell *et al.*, 2023).

6.8.3.5 ~~Using the evidence-based rates~~As discussed in paragraphs 6.8.1.5 to 6.8.1.9, the total kittiwake breeding season collision ~~estimates~~estimate for Project Design Option 1a was ~~16.7~~estimated to be 5.0, for Project Design Option 1b was ~~18.8~~5.8 and for Project Design Option 2 was ~~16.8.~~ 5.6 (Appendix 12.05 Offshore Ornithology Technical Report – Collision Risk Modelling Results).

6.8.3.6 The total kittiwake nonbreeding season collision ~~estimates~~estimate for Project Design Option 1a was ~~170.1~~25.3, for Project Design Option 1b was ~~190.3~~28.7 and for Project Design Option 2 was ~~172.0~~27.6 (Appendix 12.5 Offshore Ornithology Technical Report – Collision Risk Modelling Results).

6.8.3.7 ~~6.8.3.6~~ The percentage of kittiwakes on the Proposed Development predicted to originate from Lambay Island SPA in the breeding season was ~~13.8% (**Error! Unknown switch argument.**). Application of this rate to the total breeding season collision predictions indicated that 2.3 (Project Design Option 1a), 2.6 (Project Design Option 1b) and 2.3 (Project Design Option 2) collisions would be apportioned to the SPA.~~

~~6.8.3.7~~ 12.1% (Table 6.3044). As the ~~As these~~ collision predictions are derived from at sea survey data, they include all age classes so it is also necessary to estimate what proportion of these are adults. Kittiwake populations consist of an estimated 53% adults, with the remaining 47% distributed among sub-adult age classes (Furness, 2015). ~~Thus, using these age class proportions the Lambay Island SPA adult collisions in the breeding season would be 1.2~~Application of both the SPA percentage and the adult percentage to the total breeding season collision predictions indicates that 0.32 (Project Design Option 1a), ~~1.4~~ 0.37(Project Design Option 1b) and ~~1.2~~0.36 (Project Design Option 2) of the breeding collisions would be apportioned to the Lambay Island SPA (Table 6.52).

6.8.3.8 Of the total nonbreeding season ~~total kittiwake collision estimates, summing the autumn and spring BDMPS periods, were 170.1 (Project Design Option 1a), 190.3 (Project Design Option 1b) and 172.0 (Project Design Option 2).~~collisions, the proportion originating from the Lambay Island SPA population was estimated to be between 0.81% and 1.59% (6,640 adults divided into ~~818,181~~822,927 and 418,196~~;~~ Table 6.~~31~~45, respectively). Thus, ~~a maximum of 2.7~~between 0.20 and 0.40 (Project Design Option 1a), ~~3.0~~0.23 and 0.46 (Project Design Option 1b) and ~~2.7~~0.22 and 0.44 (Project Design Option 2) of the nonbreeding collisions would be apportioned to the Lambay Island SPA (Table 6.52).

6.8.3.9 Thus, summing the breeding ~~season collision estimates (1.2, 1.4 and 1.2 for Options 1a, 1b and 2 respectively)~~ and nonbreeding season collision estimates ~~(2.7, 3.0 and 2.7 for Options 1a, 1b and 2 respectively),~~, the annual mortality for Lambay Island SPA would be ~~3.9~~between 0.5 and 0.7 (Project Design Option 1a), ~~4.4~~0.6 and 0.8 (Project Design Option 1b) and ~~3.9~~0.6 and 0.8 (Project Design Option 2) ~~adults~~.

Table 6.52: Kittiwake collisions and apportioned mortalities to the Lambay Island SPA. B=breeding, NB=nonbreeding.

Design option	Total collisions		B apportioning (%)		NB apportioning (%)		SPA collisions (B=Total B x SPA% x adult %) (NB= Total NB x SPA Low/High %)			
	B	NB	SPA	Adults	SPA Low estimate	SPA High estimate	B	NB		Total
								Low	High	
1a	5.0	25.3	12.1	53.0	0.81 (=6,640/ 822,927)	1.59 (=6,640/ 418,196)	0.32	0.20	0.40	**0.5-0.7**
1b	5.8	28.7					0.37	0.23	0.46	**0.6-0.8**
2	5.6	27.6					0.36	0.22	0.44	**0.6-0.8**

6.8.3.10 The background adult mortality rate for kittiwake is 0.146 (Horswill and Robinson 2015), which indicates that the natural mortality for the SPA population using the most recent count (3,320 AON, Cummins *et al.*, 2019) would be 969. Addition of ~~3.9~~0.5 to ~~4.4~~0.8 adults to these would increase the background rate of the designated population by ~~0.40~~0.05 to ~~0.45~~0.08%. The threshold below which increases in background mortality are considered to be undetectable against natural variations is 1% (Parker *et al.* 2022).

6.8.3.11 Since the additional mortality based on a reasonable but precautionary assessment is far below the 1% threshold ~~(in this case around 0.40 to 0.45% rather than 1%)~~, even if the impact was substantially greater than this (already precautionary) estimate, the impact would still most likely fall well below the 1% threshold, and so we can be confident that there is no reasonable scientific doubt as to the absence of an effect.

6.8.3.12 ~~6.8.3.11~~ **Therefore, on this basis there will be no AEoI on the kittiwake feature of Lambay Island SPA, as defined by the COs of the site, as a result of collision effects considered above, from Project Design Option 1.**

6.8.3.13 ~~6.8.3.12~~ **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

Herring gull

6.8.3.14 ~~6.8.3.13~~ The conservation objective for herring gull in Lambay Island SPA can be found in Table 5.2.

6.8.3.15 ~~6.8.3.14~~ See section 6.7.2.14 for a summary of relevant herring gull ecology.

6.8.3.16 ~~6.8.3.15~~ The only potential impacts are present within the operational and maintenance phase and so therefore the other phases of development are not considered within this qualifying features assessment.

6.8.3.17 ~~6.8.3.16~~ The Lambay Island SPA population of herring gull at designation was 1,806 pairs which equates to a breeding adult population of 3,612 individuals. More recent surveys have reported 906 AON (Burnell et al., 2023).

6.8.3.18 ~~6.8.3.17~~ Herring gull collisions were only predicted to occur in ~~two~~five months, February, March, April, August and November, with none in the core breeding season months (May-July), therefore there is no breeding season connectivity of relevance between the Lambay Island SPA and the Proposed Development.

6.8.3.19 ~~6.8.3.18~~ The total nonbreeding season collisions (i.e. not apportioned among SPA colonies) was ~~1.3~~2.6 (Project Design Option 1a), ~~1.5~~2.9 (Project Design Option 1b) and ~~1.3~~2.8 (Project Design Option 2). The most recent estimate of the herring gull population from Northern Irish and Irish

colonies with connectivity to the Irish Sea (from Antrim to Waterford) is 8,635 AON (Burnell et al. 2023). Birds from Lambay Island SPA would make up 10.5% of this population, therefore 10.5% of the total collisions would equate to ~~0.16~~0.30 individuals. The adult mortality rate for herring gull is 0.166 (Horswill and Robinson 2015). The background mortality of herring gull from Lambay Island SPA would therefore be 301 individuals. Addition of the apportioned mortality to this would increase the rate by ~~0.05~~0.1% which would be undetectable against background variations (Parker et al. 2022).

6.8.3.20 Since the additional mortality based on a reasonable but precautionary assessment is far below the 1% threshold (in this case around ~~0.05~~0.1% rather than 1%), even if the impact was substantially greater than this (already precautionary) estimate, the impact would still most likely fall well below the 1% threshold, and so we can be confident that there is no reasonable scientific doubt as to the absence of an effect.

6.8.3.21 ~~6.8.3.19~~ **Therefore, on this basis there will be no AEoI on the herring gull feature of Lambay Island SPA, as defined by the ~~COs~~Conservation Objectives of the site, as a result of collision effects considered above, from Project Design Option 1.**

6.8.3.22 ~~6.8.3.20~~ **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

Lesser black-backed gull

6.8.3.23 ~~6.8.3.21~~ The conservation objective for lesser black-backed gull in Lambay Island SPA can be found in Table 5.2.

6.8.3.24 ~~6.8.3.22~~ See section 6.7.2.15 for a summary of relevant lesser black-backed gull ecology.

6.8.3.25 ~~6.8.3.23~~ The only potential impacts are present within the operational and maintenance phase and so therefore the other phases of development are not considered within this qualifying features assessment.

6.8.3.26 ~~6.8.3.24~~ The Lambay Island SPA population of lesser black-backed gull at designation was 309 pairs which equates to a breeding adult population of 618 individuals. More recent surveys have reported 345 AON (Burnell et al. 2023).

6.8.3.27 ~~6.8.3.25~~ Lesser black-backed gull collisions were only predicted to occur in one month, March, with none in the breeding season, therefore there is no breeding season connectivity of relevance between the Lambay Island SPA and the Proposed Development.

6.8.3.28 ~~6.8.3.26~~ The total nonbreeding season collisions (i.e. not apportioned among SPA colonies) was ~~0.7~~0.8 (Project Design Option 1a), ~~0.7~~0.8 (Project Design Option 1b) and ~~0.6~~0.8 (Project Design Option 2). The most recent estimate of the lesser black-backed gull population from Northern Irish and Irish colonies with connectivity to the Irish Sea (from Antrim to Waterford) is 5,362 AON (Burnell et al. 2023). Birds from Lambay Island SPA would make up 6.4% of this population, therefore 6.4% of the total collisions would equate to ~~0.04~~0.05 individuals. The adult mortality rate for lesser black-backed gull is 0.115 (Horswill and Robinson 2015). The background mortality of lesser black-backed gull from Lambay Island SPA would therefore be 79 individuals. Addition of the apportioned mortality to this would increase the rate by ~~0.05~~0.06% which would be undetectable against background variations (Parker et al. 2022).

6.8.3.29 Since the additional mortality based on a reasonable but precautionary assessment is far below the 1% threshold (in this case around ~~0.05~~0.06% rather than 1%), even if the impact was substantially greater than this (already precautionary) estimate, the impact would still most likely fall well below the 1% threshold, and so we can be confident that there is no reasonable scientific doubt as to the absence of an effect.

6.8.3.30 ~~6.8.3.27~~ **Therefore, on this basis there will be no AEoI on the lesser black-backed gull feature of Lambay Island SPA, as defined by the COs of the site, as a result of collision effects considered above, from Project Design Option 1.**

6.8.3.31 ~~6.8.3.28~~ **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

Guillemot

6.8.3.32 ~~6.8.3.29~~ The conservation objective for guillemot in Lambay Island SPA can be found in Table 5.2.

6.8.3.33 ~~6.8.3.30~~ See Section 6.7.2.16 for a summary of relevant guillemot ecology and Section 6.8.2.27 for assessment methods.

6.8.3.34 ~~6.8.3.31~~ The Lambay Island SPA population of guillemot at designation was 59,824 individuals. More recent surveys have reported 59,983 (Burnell et al., 2023).

6.8.3.35 ~~6.8.3.32~~ On the basis of the apportioning (~~**Error! Unknown switch argument.**), 64.6~~Table 6.3248), 60.8% of the adult guillemots recorded on the Proposed Development in the breeding season would be predicted to originate from Lambay Island SPA. During the nonbreeding season, between 3.8% and 10.6% of the adult guillemots recorded on the Proposed Development in the breeding season would be predicted to originate from Lambay Island SPA (59,824 divided by 563,371 and 1,567,463 respectively).

CONSTRUCTION

6.8.3.36 ~~6.8.3.33~~ In order to calculate the number of guillemots that potentially would be at risk of displacement from the Cable Corridor and Working Area during the cable laying process, the density of this species in the Cable Corridor and Working Area (corridor 1 and corridor 2) was estimated from the site-specific surveys carried out for the Proposed Development (NIS Volume III, Appendix ~~12.1:~~ Offshore Ornithology Technical Report – Overview (Revised March 2026)).

6.8.3.37 ~~6.8.3.34~~ During the breeding season (March to July), the seasonal peak density in corridor 1 was ~~2.9~~15.2 birds/ km^2 and in corridor 2 was ~~3.3~~10.5 birds/ km^2. Within a 2 km radius of disturbance around a cable laying vessel (12.56 km^2), ~~22~~114 individuals (~~2.9~~15.2 x 12.56 x 60%) could be at risk of displacement along corridor 1 and ~~25~~79 (~~3.3~~10.5 x 12.56 x 60%) along corridor 2, ~~47~~193 in total. This means that, across all populations, ~~0.47~~1.93 individuals (1%) would be at risk of mortality due to cable installation, of which ~~64.6% (0.3~~60.8% (1.2 individuals) would be at risk from Lambay Island SPA.

6.8.3.38 ~~6.8.3.35~~ During the nonbreeding season (August to February), the seasonal peak density in corridor 1 was ~~27.3~~25.4 birds/ km2 and in corridor 2 was ~~12.6~~12.2 birds/ km^2. Within a 2 km radius of disturbance around a cable laying vessel (12.56 km^2), ~~206~~191 individuals (~~27.3~~25.4 x 12.56 x 60%) could be at risk of displacement along corridor 1 and ~~95~~92 (~~12.6~~12.2 x 12.56 x 60%) along corridor 2, ~~301~~283 in total. This means that, across all populations, ~~3~~2.83 individuals (1%) would be at risk of mortality due to cable installation, of which between 3.8% and 10.6% (~~**Error! Unknown switch argument.**~~Table 6.~~33~~49Table 6.3349), 0.1 and 0.3 individuals, would be at risk from Lambay Island SPA.

6.8.3.39 ~~6.8.3.36~~ Thus, summing the breeding season (~~0.3~~1.2) and maximum nonbreeding season (0.3) construction displacement mortalities, the potential annual mortality on the Lambay Island SPA guillemot population would be ~~0.6~~1.5 adults.

6.8.3.40 ~~6.8.3.37~~ The background adult mortality rate for guillemot is 0.061 (Horswill and Robinson, 2015), which indicates that the natural mortality for this SPA population would be 3,659 individuals (59,983 x 0.061). Addition of a maximum of ~~0.6~~1.5 individuals to this would increase the

background rate by ~~0.02~~0.04%. This is a very small increase and would be undetectable against natural variations. The threshold below which increases in background mortality are considered to be undetectable against natural variations is 1% (Parker et al. 2022). Since the additional mortality based on a reasonable but precautionary assessment is far below the 1% threshold, even if the impact was substantially greater than this (already precautionary) estimate, the impact would still most likely fall well below the 1% threshold, and so we can be confident that there is no reasonable scientific doubt as to the absence of an effect.

6.8.3.41 ~~6.8.3.38~~ **Therefore, on this basis there will be no AEoI on the guillemot feature of Lambay Island SPA, as defined by the ~~COs~~Conservation Objectives of the site, as a result of construction displacement effects considered above, from Project Design Option 1.**

6.8.3.42 ~~6.8.3.39~~ **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

OPERATIONAL

6.8.3.43 ~~6.8.3.40~~ As discussed above (Section ~~6.8.2.27~~6.8.2.27) the assumption for guillemots is that displacement from windfarms occurs at a constant level to a distance of 2 km in line with guidance (SNCBs 2022) and that within this area, ~~30% to 70~~following NatureScot guidance, 60% of birds will be displaced ~~and~~of which mortality ~~of displaced birds will~~would be between 3% and 5% in the breeding season and between 1% and ~~10~~3% in the nonbreeding seasons, with evidence-based rates of 50% displaced and 1% mortality (MacArthur Green, 2019).

6.8.3.44 ~~6.8.3.41~~ During the breeding season (March to July), the seasonal peak abundance in the Array Area and 2 km buffer was ~~3,033~~9,010 birds. Thus, in total, between ~~9~~162 (~~30~~60% displaced and ~~1~~3% mortality) and ~~212~~270 (~~70~~60% displaced, ~~10~~5% mortality) could be at risk of displacement mortality, with the evidence-based prediction of ~~15~~45 (50% displaced and 1% mortality). Of these, ~~64.6% (~~Table 6.~~32~~48~~) which equate to 5.8, 9.7 and 137 individuals at the respective rates,~~57% would be adults (Furness 2015) and, 60.8% would be at risk from Lambay Island SPA (Table 6.~~32~~48) which combined equate to 15.6, 56.1 and 93.6, individual adults from the SPA at the respective rates (50x1, 60x3 and 60x5).

6.8.3.45 ~~6.8.3.42~~ During the nonbreeding season (August to February), the seasonal peak abundance in the Array Area and 2 km buffer was ~~5,079~~3,991 birds. Thus, in total, between ~~15~~24 (~~30~~60% displaced and 1% mortality) and ~~356~~72 (~~70~~60% displaced, ~~10~~3% mortality) could be at risk of displacement mortality, with the ~~evidence-based~~evidence-based prediction of ~~25~~20 (50% displaced and 1% mortality). Of these, between 3.8% and 10.6% ~~(~~Table 6.~~33~~49~~) which equate to maximums of 1.6, 2.6 and 37.7 individuals at the respective rates,~~ would be adults at risk from Lambay Island SPA (Table 6.~~33~~49Table 6.~~33~~49) which equate to maximums of 2.1, 2.5 and 7.6 individuals at the respective rates.

6.8.3.46 ~~6.8.3.43~~ Thus, summing the breeding season (~~5.8~~15.6, ~~9.7~~56.1, ~~137~~93.6) and nonbreeding season (~~1.6~~12.1, ~~2.6~~2.5, ~~37.7~~7.6) operational displacement mortalities, the potential annual mortality on the Lambay Island SPA guillemot population would be ~~7.4~~17.7, ~~12.3~~58.6 and ~~174.7~~101.2 adults, respectively.

6.8.3.47 ~~6.8.3.44~~ The background adult mortality rate for guillemot is 0.061 (Horswill and Robinson, 2015), which indicates that the natural mortality for this SPA population would be 3,659 individuals (59,983 x 0.061). Addition of individuals subject to displacement mortality would increase the background rate by ~~0.2~~0.48%, ~~0.3~~1.6% and ~~4.8~~2.7%. While the most precautionary displacement rates result in an increase in background mortality above the 1% threshold of detectability (Parker *et al.* 2022), this is not the case at the evidence based rates (50% displaced and 1% mortality).

6.8.3.48 Since the additional mortality based on a reasonable but precautionary assessment is far below the 1% threshold, even if the impact was substantially greater than this (already precautionary)

estimate, the impact would still most likely fall well below the 1% threshold, and so we can be confident that there is no reasonable scientific doubt as to the absence of an effect.

6.8.3.49 ~~6.8.3.45~~ **Therefore, on this basis there will be no AEoI on the guillemot feature of Lambay Island SPA, as defined by the COs of the site, as a result of operational displacement effects considered above, from Project Design Option 1.**

6.8.3.50 ~~6.8.3.46~~ **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

Razorbill

6.8.3.51 ~~6.8.3.47~~ The conservation objective for razorbill in Lambay Island SPA can be found in Table 5.2.

6.8.3.52 ~~6.8.3.48~~ See Section 6.7.2.18 for a summary of relevant razorbill ecology and see section 6.8.2.53 for assessment methods.

6.8.3.53 ~~6.8.3.49~~ The Lambay Island SPA population of razorbill at designation was 4,337 individuals. More recent surveys have reported 7,353 (Burnell et al., 2023).

6.8.3.54 ~~6.8.3.50~~ On the basis of the apportioning (Table 6.~~34~~50~~), 45.3~~Table 6.~~34~~50Table 6.~~34~~50), 34.9% of the adult razorbills recorded on the Proposed Development in the breeding season would be predicted to originate from Lambay Island SPA. During the nonbreeding season, between 1.3% and 7.6% of the adult razorbills recorded on the Proposed Development in the breeding season would be predicted to originate from Lambay Island SPA (7,353 divided by 96,268 and 554,179 respectively).

CONSTRUCTION

6.8.3.55 ~~6.8.3.51~~ In order to calculate the number of razorbills that potentially would be at risk of displacement from the Cable Corridor and Working Area during the cable laying process, the density of this species in the Cable Corridor and Working Area (corridor 1 and corridor 2) was estimated from the site-specific surveys carried out for the Proposed Development (Appendix 12.1: Offshore Ornithology Offshore Ornithology Technical Report - Overview).

6.8.3.56 ~~6.8.3.52~~ During the breeding season (April to July), the seasonal peak density in corridor 1 was ~~0.3~~1.24 birds/ km^2 and in corridor 2 was ~~0.3~~0.51 birds/ km^2. Within a 2 km radius of disturbance around a cable laying vessel (12.56 km^2), ~~2~~9.3 individuals (~~0.3~~1.24 x 12.56 x 60%) could be at risk of displacement along corridor 1 and ~~2~~3.8 (0.3 x 12.56 x 60%) along corridor 2, ~~4~~13.1 in total. This means that, across all populations, ~~0.04~~0.13 individuals (1%) would be at risk of mortality due to cable installation, of which ~~45.3% (0.02~~34.9 (0.04 individuals) would be at risk from Lambay Island SPA.

6.8.3.57 ~~6.8.3.53~~ During autumn migration (August to October), at a seasonal peak density of ~~3.2~~2.17 birds/ km2 (corridor 1) and ~~4.5~~2.69 birds/ km2 (corridor 2), with a 2 km radius of disturbance around a cable laying vessel (12.56 km2), a maximum of ~~48~~16.3 individuals (~~3.2~~2.17 x 12.56 x 60%) could be at risk of displacement along corridor 1 and ~~34~~20.3 (~~4.5~~2.69 x 12.56 x 60%) along corridor 2, ~~82~~36.6 in total. This means that ~~0.82~~0.37 individuals (1%) are at risk of mortality due to cable installation.

6.8.3.58 ~~6.8.3.54~~ During the winter period (November and December), at a seasonal peak density of ~~9.5~~8.2 birds/ km2 (corridor 1) and ~~5.0~~4.9 birds/ km2 (corridor 2), with a 2 km radius of disturbance around a cable laying vessel (12.56 km2), a maximum of ~~72~~61.8 individuals (~~9.5~~8.2 x 12.56 x 60%) could be at risk of displacement along corridor 1 and ~~38~~36.9 (~~5.0~~4.9 x 12.56 x 60%) along corridor 2, ~~110~~98.7 in total. This means that ~~1.1~~1.0 individuals (1%) are at risk of mortality due to cable installation.

6.8.3.59 ~~6.8.3.55~~ During the spring migration (January to March), at a seasonal peak density of ~~0.7~~0.66 birds/ km2 (corridor 1) and ~~0.3~~1.8 birds/ km2 (corridor 2), with a 2 km radius of disturbance around

a cable laying vessel (12.56 km2), a maximum of ~~five~~5 individuals (~~0.7~~0.66 x 12.56 x 60%) could be at risk of displacement along corridor 1 and ~~two~~13.5 (0.3 x 12.56 x 60%) along corridor 2, ~~seven~~18.5 in total. This means that ~~0.07~~0.18 individuals (1%) are at risk of mortality due to cable installation.

6.8.3.60 ~~6.8.3.56~~ Of the total autumn, winter and spring mortalities, the proportion originating from the Lambay Island SPA population was estimated to be between 1.3% and 7.6%. Thus, of the total nonbreeding construction displacement mortality ~~2.0 (0.82, 1.1, 0.07~~of 1.6 (0.37 1.0, 0.18), a maximum of ~~0.15~~0.12 of the nonbreeding mortalities would be apportioned to the Lambay Island SPA.

6.8.3.61 ~~6.8.3.57~~ Thus, summing the breeding season (~~0.02~~0.04) and nonbreeding season (~~0.15~~0.12) construction displacement mortalities, the potential annual mortality on the Lambay Island SPA razorbill population would be ~~0.17~~0.16 adults.

6.8.3.62 ~~6.8.3.58~~ The background adult mortality rate for razorbill is 0.105 (Horswill and Robinson, 2015), which indicates that the natural mortality for this SPA population would be 779 individuals (7,353 x 0.105). Addition of a maximum of ~~0.17~~0.16 individuals to this would increase the background rate by 0.02%. This is a very small increase and would be undetectable against natural variations. The threshold below which increases in background mortality are considered to be undetectable against natural variations is 1% (Parker et al. 2022).

6.8.3.63 Since the additional mortality based on a reasonable but precautionary assessment is far below the 1% threshold, even if the impact was substantially greater than this (already precautionary) estimate, the impact would still most likely fall well below the 1% threshold, and so we can be confident that there is no reasonable scientific doubt as to the absence of an effect.

6.8.3.64 ~~6.8.3.59~~ **Therefore, on this basis there will be no AEoI on the razorbill feature of Lambay Island SPA, as defined by the COs of the site, as a result of construction displacement effects considered above, from Project Design Option 1.**

6.8.3.65 ~~6.8.3.60~~ **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

OPERATIONAL

6.8.3.66 ~~6.8.3.61~~ The assumption for razorbills is that displacement from windfarms occurs at a constant level to a distance of 2 km in line with guidance (SNCBs 2022) and that within this area, ~~30% to 70~~following NatureScot guidance, 60% of birds will be displaced ~~and~~of which mortality ~~of displaced birds will~~would be between 3% and 5% in the breeding season and between 1% and ~~10~~3% in the nonbreeding seasons.

6.8.3.67 ~~6.8.3.62~~ Empirical evidence indicates that auk (guillemot and razorbill) displacement from windfarms is likely to be lower than ~~70~~60%, although pre- and post-construction monitoring data have yielded variable results (see Section ~~6.8.2.41~~6.8.2.41 for a discussion).

6.8.3.68 ~~6.8.3.63~~ The ~~10~~5% mortality rate for auks is unconfirmed and this magnitude of impact is not supported in the literature. Given that this is equivalent to half of the existing natural adult annual mortality for razorbill from all other sources of mortality (baseline mortality is 10.5%; Horswill and Robinson 2015), it is highly improbable that such an effect would occur. Mortality due to displacement might arise if displacement increased competition for resources in the remaining areas of auk habitat outside the windfarm. However, it should be recognised that the mortality rate due to displacement may well be 0% since the increase in density of auks outside the windfarm area will be negligible (because the rest of the available habitat is vast) and is very unlikely to be as high as ~~10~~5%.

6.8.3.69 ~~6.8.3.64~~ MacArthur Green (2019) undertook a review of available evidence for auk displacement and concluded that precautionary rates of displacement and mortality from operational windfarms

would be 50% and 1% respectively. Thus, this assessment presents displacement in the range from ~~30~~50% displaced and 1% mortality to ~~70~~60% displaced and ~~1~~03%-5% mortality (breeding season) and 1%-3% mortality (nonbreeding seasons), with a focus on the evidence-based rates of 50% displaced and 1% mortality.

6.8.3.70 ~~6.8.3.65~~ During the breeding season (April to July), the seasonal peak abundance in the Array Area and 2 km buffer was ~~211~~488 birds. Thus, in total, between ~~1~~8.8 (~~30~~60% displaced and ~~1~~3% mortality) and ~~15~~14.6 (~~70~~60% displaced, ~~10~~5% mortality) could be at risk of displacement mortality, with the evidence-based prediction of ~~1~~2.4 (50% displaced and 1% mortality). Of these, ~~45.3% (~~Table 6.~~34~~50~~) which equate to 0.05, 0.05 and 6.8 individuals at the respective rates,~~57% would be adults (Furness 2015) and 34.9% would be at risk from Lambay Island SPA (Table 6.~~34~~50Table 6.~~34~~50) which combined equate to 0.48, 1.75 and 2.9 individuals at the respective rates.

6.8.3.71 ~~6.8.3.66~~ During the autumn season (August to October), the seasonal peak abundance in the Array Area and 2 km buffer was ~~2,319~~2,570 birds. Thus, in total, between ~~7~~15.4 (~~30~~60% displaced and 1% mortality) and ~~162~~46.3 (~~70~~60% displaced, ~~10~~3% mortality) could be at risk of displacement mortality, with the evidence-based prediction of ~~12~~12.8 (50% displaced and 1% mortality).

6.8.3.72 ~~6.8.3.67~~ During the winter (November and December), the seasonal peak abundance in the Array Area and 2 km buffer was ~~2,072~~2,558 birds. Thus, in total, between ~~6~~15.3 (~~30~~60% displaced and 1% mortality) and ~~145~~46.0 (~~70~~60% displaced, ~~10~~3% mortality) could be at risk of displacement mortality, with the evidence-based prediction of ~~10~~12.8 (50% displaced and 1% mortality).

6.8.3.73 ~~6.8.3.68~~ During the spring season (January to March), the seasonal peak abundance in the Array Area and 2 km buffer was 3,711 birds. Thus, in total, between ~~11~~22 (~~30~~60% displaced and 1% mortality) and ~~260~~66.8 (~~70~~60% displaced, ~~10~~3% mortality) could be at risk of displacement mortality, with the ~~evidence-based~~evidence based prediction of ~~19~~18.6 (50% displaced and 1% mortality).

6.8.3.74 ~~6.8.3.69~~ Of the total autumn, winter and spring mortalities, the proportion originating from the Lambay Island SPA population was estimated to be between 1.3% and 7.6% (7,353 adults divided into 554,179 and 96,268). Thus, of the total nonbreeding operational displacement mortality of ~~24~~44.2, ~~41~~52.7 and ~~567~~159.1 (at each combination of rates respectively), maximums of between ~~1.8~~3.3 (~~24~~44.2 x 7.6%) and ~~43.1~~12.1 (~~567~~159.1 x 7.6%) of the nonbreeding mortalities would be apportioned to the Lambay Island SPA.

6.8.3.75 ~~6.8.3.70~~ Thus, ~~with the addition of~~summing the breeding season mortality (0.48, 1.75 and 2.9) and the nonbreeding season mortality (3.3, 4.0 and 12.1) the annual mortality on the Lambay Island SPA razorbill population would be ~~between 1.85 and 49.9, with the evidence-based estimate of 3.2~~3.78, 5.75 and 15.0 adults respectively.

6.8.3.76 ~~6.8.3.71~~ The background adult mortality rate for razorbill is 0.105 (Horswill and Robinson, 2015), which indicates that the natural mortality for this SPA population would be 779 individuals (7,353 x 0.105). Addition of individuals subject to displacement mortality would increase the background rate by ~~0.2~~0.48%, ~~0.4~~0.71% and ~~6.4~~1.92%. While the most precautionary displacement rates result in an increase in background mortality above the 1% threshold of detectability (Parker et al. 2022), this is not the case at the evidence-based rates (50% displaced and 1% mortality).

6.8.3.77 Since the additional mortality based on a reasonable but precautionary assessment is far below the 1% threshold, even if the impact was substantially greater than this (already precautionary) estimate, the impact would still most likely fall well below the 1% threshold, and so we can be confident that there is no reasonable scientific doubt as to the absence of an effect.

6.8.3.78 ~~6.8.3.72~~ **Therefore, on this basis there will be no AEoI on the razorbill feature of Lambay Island SPA, as defined by the COs of the site, as a result of operational displacement effects considered above, from Project Design Option 1.**

6.8.3.79 ~~6.8.3.73~~ **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

6.8.4 Saltee Island SPA

Kittiwake

6.8.4.1 The conservation objective for kittiwake in Saltee Islands SPA can be found in Table 5.2.

6.8.4.2 See Section 6.7.2.7 for a summary of relevant kittiwake ecology.

6.8.4.3 The only potential impacts are present within the operational and maintenance phase and so therefore the other phases of development are not considered within this qualifying features assessment.

6.8.4.4 The Saltee Islands SPA population of kittiwake at designation was 2,125 AON which equates to a breeding adult population of 4,250. More recent surveys have reported 1,038 AON (Burnell *et al.*, 2023).

6.8.4.5 ~~Using the evidence-based rates~~As discussed in paragraphs 6.8.1.5 to 6.8.1.9, the total kittiwake breeding season collision ~~estimates~~estimate for Project Design Option 1a was estimated to be ~~16.7~~5.0, for Project Design Option 1b was ~~18.8~~5.8 and for Project Design Option 2 was ~~16.8.~~5.6 (Appendix 12.05 Offshore Ornithology Technical Report – Collision Risk Modelling Results).

6.8.4.6 The total kittiwake nonbreeding season collision ~~estimates~~estimate for Project Design Option 1a was ~~estimated to be 170.1~~25.3, for Project Design Option 1b was ~~190.3~~28.7 and for Project Design Option 2 was ~~172.0~~27.6 (Appendix 12.5 Offshore Ornithology Technical Report – Collision Risk Modelling Results).

6.8.4.7 ~~6.8.4.6~~ The percentage of ~~kittiwake on~~kittiwakes recorded within the Proposed Development predicted to originate from the Saltee Islands SPA in the breeding season was ~~2.3% (~~Table 6.~~30~~44~~). Application of this rate to the total breeding season collision predictions indicated that 0.4 (Project Design Option 1a, Project Design Option 1b and Project Design Option 2) collisions would be apportioned to the SPA.~~

~~6.8.4.7~~2.0% (Table 6.3044). As the ~~As these~~ collision predictions are derived from at sea survey data, they include all age classes so it is also necessary to estimate what proportion of these are adults. Kittiwake populations consist of an estimated 53% adults, with the remaining 47% distributed among sub-adult age classes (Furness, 2015). ~~Thus, using these age class proportions the Saltee Islands SPA adult collisions in the breeding season would be 0.2 (Project Design Option 1a, Project Design Option 1b and Project Design Option 2).~~Application of both the SPA percentage and the adult percentage to the total breeding season collision predictions indicates that between 0.05 and 0.10 collisions would be apportioned to adults from the SPA for all Project Design Options (Table 6.53).

6.8.4.8 Of the total nonbreeding season ~~total kittiwake collision estimates, summing the autumn and spring BDMPS periods, were 170.1 (Project Design Option 1a), 190.3 (Project Design Option 1b) and 172.0 (Project Design Option 2).~~collisions, the proportion originating from the Saltee Islands SPA population was estimated to be between 0.25% and ~~0.5~~0.49% (2,076 adults divided into ~~8181,181~~822,927 and 418,196~~;~~ Table 6.~~31~~45, respectively). Thus, ~~a maximum of 0.8~~between 0.05 and 0.13 (Project Design Option 1a), ~~0.9~~0.06 and 0.14 (Project Design Option 1b) and ~~0.8~~0.06 and 0.14 (Project Design Option 2) of the nonbreeding collisions would be apportioned to the Saltee Islands SPA (Table 6.53).

6.8.4.9 Thus, summing the breeding season ~~collision estimates 0.2 (for Options 1a, 1b and 2 respectively)~~ and nonbreeding ~~season collision estimates 0.8, 0.9 and 0.8 (for Options 1a, 1b and 2 respectively), these~~seasons the maximum annual mortality for the Saltee Islands SPA would be ~~1.0 (Project Design Option 1a), 1.1 (Project Design Option 1b) and 1.0 (Project Design Option 2) adults~~between 0.1 and 0.2 for all design options.

Table 6.53: Kittiwake collisions and apportioned mortalities to the Saltee Islands SPA B=breeding, NB=nonbreeding

Design option	Total collisions		B apportioning (%)		NB apportioning (%)		SPA collisions (B=Total B x SPA% x adult %) (NB= Total NB x SPA Low/High %)			
	B	NB	SPA	Adults	SPA Low estimate	SPA High estimate	B	NB		Total
								Low	High	
1a	5.0	25.3	2.0	53.0	0.25 (=2,076/ 822,927)	0.49 (=2,076/ 418,196)	0.05	0.06	0.13	**0.1-0.2**
1b	5.8	28.7					0.06	0.07	0.14	**0.1-0.2**
2	5.6	27.6					0.06	0.07	0.14	**0.1-0.2**

6.8.4.10 The background adult mortality rate for kittiwake is 0.146 (Horswill and Robinson 2015), which indicates that the natural mortality for the SPA population using the most recent count (1,038 AON, Cummins *et al.*, 2019) would be 303. Addition of ~~1.0~~0.1 to ~~1.1~~0.2 adults to these would increase the background rate of the designated population by ~~0.34~~0.03 to ~~0.37~~0.06%. The threshold below which increases in background mortality are considered to be undetectable against natural variations is 1% (Parker *et al.* 2022).

6.8.4.11 Since the additional mortality based on a reasonable but precautionary assessment is far below the 1% threshold ~~(in this case around 0.34 to 0.37% rather than 1%),~~ even if the impact was substantially greater than this (already precautionary) estimate, the impact would still most likely fall well below the 1% threshold, and so we can be confident that there is no reasonable scientific doubt as to the absence of an effect.

6.8.4.12 ~~6.8.4.11~~ **Therefore, on this basis there will be no AEoI on the kittiwake feature of Saltee Island SPA, as defined by the COs of the site, as a result of collision effects considered above, from Project Design Option 1.**

6.8.4.13 ~~6.8.4.12~~ **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

Gannet

6.8.4.14 ~~6.8.4.13~~ The conservation objective for gannet in Saltee Islands SPA can be found in Table 5.2.

6.8.4.15 ~~6.8.4.14~~ See section 6.7.2.11 for a summary of relevant gannet ecology.

6.8.4.16 ~~6.8.4.15~~ The only potential impacts are present within the operational and maintenance phase and so therefore the other phases of development are not considered within this qualifying features assessment.

6.8.4.17 ~~6.8.4.16~~ The Saltee Islands SPA population of gannet at designation was 2,446 pairs (apparently occupied nests) which equates to a breeding adult population of 4,892. More recent surveys have reported 4,772 AON (Burnell et al., 2023).

6.8.4.18 ~~6.8.4.17~~ Using the evidence-based rates, the total gannet breeding season collision estimates for the Proposed Development was ~~0.6~~0.9, (Project Design Option 1a, Project Design Option 1b and Project Design Option 2). The total gannet nonbreeding season collision estimates for Project

Design Option 1a was ~~0.3~~0.4, for Project Design Option 1b was ~~0.3~~0.5 and for Project Design Option 2 was ~~0.2~~0.5.

6.8.4.19 ~~6.8.4.18~~ The percentage of gannets on the Proposed Development predicted to originate from Saltee Islands SPA in the breeding season was 100%, on the basis that there is very little overlap in the foraging ranges from different gannet colonies and records from tracking studies has indicated that birds in the region of Arklow are expected to have originated from Saltee Islands SPA (Wakefield et al. 2013). Thus, all of the breeding season collisions (~~0.6~~0.9) were apportioned to this SPA.

6.8.4.20 In addition, of the peak of 72 birds recorded in the breeding season which could be at risk of displacement, even at the highest combination of displacement (80%) and mortality (1%) this adds only 1 individual to the assessment.

6.8.4.21 ~~6.8.4.19~~ As these collision and displacement predictions are derived from at sea survey data, they include all age classes. Gannet populations consist of an estimated 55% adults, with the remaining 45% distributed among sub-adult age classes (Furness, 2015). Thus, using these age class proportions the Saltee Islands SPA adult displacement and collisions in the breeding season would be ~~0.33 (~~1.0 (0.9 + 1.0 x 55% Project Design Option 1a, Project Design Option 1b and Project Design Option 2).

6.8.4.22 ~~6.8.4.20~~ Gannets range very widely during the nonbreeding season and many colonies could have the potential to pass through the Irish Sea in autumn and spring. The most recent all Britain and Ireland population estimate is 360,748 AON (Burnell et al. 2023). However, in order to be precautionary, for this assessment only Irish colonies in the Irish Sea have been considered. This gives a population of 12,386 AON which equates to an all age class population of 46,676 individuals (=12,836 x 2 x 1.82, to account for adults (x2) and immatures (x1.82)).

6.8.4.23 ~~6.8.4.21~~ The nonbreeding season total gannet collision estimates, summing the autumn and spring BDMPS periods, were ~~0.3~~0.4 (Project Design Option 1a), ~~0.3~~0.4 (Project Design Option 1b) and ~~0.2~~0.5 (Project Design Option 2). The proportion originating from the Saltee Islands SPA population was estimated to be 20% (9,544 adults divided into 46,676). Thus, ~~0.06~~0.08 (Project Design Option 1a), ~~0.06~~0.1 (Project Design Option 1b) and ~~0.04~~0.1 (Project Design Option 2) of the nonbreeding collisions would be apportioned to the Saltee Islands SPA. There were no predicted displacement mortalities in the nonbreeding seasons so no displacement mortality is apportioned to the SPA in the nonbreeding seasons.

6.8.4.24 ~~6.8.4.22~~ Thus, summing the breeding season displacement and collision estimates ~~0.33~~1.0 (for Options 1a, 1b and 2 respectively) and nonbreeding season collision estimates ~~0.06~~0.08, ~~0.06~~0.08 and ~~0.04~~0.1 (for Options 1a, 1b and 2 respectively), the annual mortality for Saltee Islands SPA adults would be ~~0.4~~1.08 (Project Design Option 1a), ~~0.4~~1.08 (Project Design Option 1b) and ~~0.4~~1.1 (Project Design Option 2) ~~adults~~.

6.8.4.25 ~~6.8.4.23~~ The background adult mortality rate for gannet is 0.081 (Horswill and Robinson 2015), which indicates that the natural mortality for the SPA population using the most recent count (4,772 AON) would be 773. Addition of ~~0.4~~up to 1.1 adults to this would increase the background rate of the designated population by ~~0.05~~0.14%. The threshold below which increases in background mortality are considered to be undetectable against natural variations is 1% (Parker et al. 2022).

6.8.4.26 Since the additional mortality based on a reasonable but precautionary assessment is far below the 1% threshold (in this case around ~~0.05~~0.14% rather than 1%), even if the impact was substantially greater than this (already precautionary) estimate, the impact would still most likely fall well below the 1% threshold, and so we can be confident that there is no reasonable scientific doubt as to the absence of an effect.

6.8.4.27 ~~6.8.4.24~~ **Therefore, on this basis there will be no AEoI on the gannet feature of Saltee Island SPA, as defined by the COs of the site, as a result of collision effects considered above, from Project Design Option 1.**

6.8.4.28 ~~6.8.4.25~~ **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

Herring gull

6.8.4.29 ~~6.8.4.26~~ The conservation objective for herring gull in Saltee Islands SPA can be found in Table 5.2.

6.8.4.30 ~~6.8.4.27~~ See section 6.7.2.14 for a summary of relevant herring gull ecology.

6.8.4.31 ~~6.8.4.28~~ The only potential impacts are present within the operational and maintenance phase and so therefore the other phases of development are not considered within this qualifying features assessment.

6.8.4.32 ~~6.8.4.29~~ The Saltee Islands SPA population of herring gull at designation was 73 pairs which equates to a breeding adult population of 146 individuals. More recent surveys have reported 115 AON (Burnell et al., 2023).

6.8.4.33 ~~6.8.4.30~~ Herring gull collisions were only predicted to occur in ~~two~~five months, February, March, April, August and November, with none in the core breeding season months (May-July), therefore there is no breeding season connectivity of relevance between the Saltee Islands SPA and the Proposed Development.

6.8.4.34 ~~6.8.4.31~~ The total nonbreeding season collisions (i.e. not apportioned among SPA colonies) were estimated at ~~1.3~~2.6 (Project Design Option 1a), ~~1.5~~2.9 (Project Design Option 1b) and ~~1.3~~2.8 (Project Design Option 2). The most recent estimate of the herring gull population from Northern Irish and Irish colonies with connectivity to the Irish Sea (from Antrim to Waterford) is 8,635 AON (Burnell et al. 2023). Birds from Saltee Islands SPA would make up 1.3% of this population, therefore 1.3% of the total collisions would equate to 0.02 individuals. The adult mortality rate for herring gull is 0.166 (Horswill and Robinson 2015). The background mortality of herring gull from Saltee Islands SPA would therefore be 38 individuals. Addition of the apportioned mortality to this would increase the rate by ~~0.05~~0.1% which would be undetectable against background variations (Parker et al. 2022).

6.8.4.35 Since the additional mortality based on a reasonable but precautionary assessment is far below the 1% threshold (in this case around ~~0.05~~0.1% rather than 1%), even if the impact was substantially greater than this (already precautionary) estimate, the impact would still most likely fall well below the 1% threshold, and so we can be confident that there is no reasonable scientific doubt as to the absence of an effect.

6.8.4.36 ~~6.8.4.32~~ **Therefore, on this basis there will be no AEoI on the herring gull feature of Saltee Island SPA, as defined by the COs of the site, as a result of collision effects considered above, from Project Design Option 1.**

6.8.4.37 ~~6.8.4.33~~ **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

Lesser black-backed gull

6.8.4.38 ~~6.8.4.34~~ The conservation objective for lesser black-backed gull in Saltee Islands SPA can be found in Table 5.2.

6.8.4.39 ~~6.8.4.35~~ See section 6.7.2.15 for a summary of relevant lesser black-backed gull ecology.

6.8.4.40 ~~6.8.4.36~~ The only potential impacts are present within the operational and maintenance phase and so therefore the other phases of development are not considered within this qualifying features assessment.

6.8.4.41 ~~6.8.4.37~~ The Saltee Islands SPA population of lesser black-backed gull at designation was 175 pairs which equates to a breeding adult population of 350 individuals. More recent surveys have reported 251 AON (Burnell et al., 2023).

6.8.4.42 ~~6.8.4.38~~ Lesser black-backed gull collisions were only predicted to occur in one month, March, with none in the breeding season, therefore there is no breeding season connectivity of relevance between the Saltee Islands SPA and the Proposed Development.

6.8.4.43 ~~6.8.4.39~~ The total nonbreeding season collisions (i.e. not apportioned among SPA colonies) were estimated at ~~0.7~~0.8 (Project Design Option 1a), ~~0.7~~0.8 (Project Design Option 1b) and ~~0.6~~0.8 (Project Design Option 2). The most recent estimate of the lesser black-backed gull population from Northern Irish and Irish colonies with connectivity to the Irish Sea (from Antrim to Waterford) is 5,362 AON (Burnell et al. 2023). Birds from Saltee Islands SPA would make up 9.4% of this population, therefore 9.4% of the total collisions would equate to ~~0.06~~0.07 individuals. The adult mortality rate for lesser black-backed gull is 0.115 (Horswill and Robinson 2015). The background mortality of lesser black-backed gull from Saltee Islands SPA would therefore be 58 individuals. Addition of the apportioned mortality to this would increase the rate by ~~0.01~~0.13% which would be undetectable against background variations (Parker et al. 2022). Since the additional mortality based on a reasonable but precautionary assessment is far below the 1% threshold (in this case around ~~0.05~~0.13% rather than 1%), even if the impact was substantially greater than this (already precautionary) estimate, the impact would still most likely fall well below the 1% threshold, and so we can be confident that there is no reasonable scientific doubt as to the absence of an effect.

6.8.4.44 ~~6.8.4.40~~ **Therefore, on this basis there will be no AEoI on the lesser black-backed gull feature of Saltee Island SPA, as defined by the COs of the site, as a result of collision effects considered above, from Project Design Option 1.**

6.8.4.45 ~~6.8.4.41~~ **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

Guillemot

6.8.4.46 ~~6.8.4.42~~ The conservation objective for guillemot in Saltee Islands SPA can be found in Table 5.2.

6.8.4.47 ~~6.8.4.43~~ See section 6.7.2.16 for a summary of relevant guillemot ecology and section 6.8.2.27 for assessment methods.

6.8.4.48 ~~6.8.4.44~~ The Saltee Islands SPA population of guillemot at designation was 21,436 individuals. More recent surveys have reported 25,581 (Burnell et al. 2023).

6.8.4.49 ~~6.8.4.45~~ On the basis of the apportioning (Table 6.~~32~~48~~), 15.0~~Table 6.~~32~~48), 14.1% of the adult guillemots recorded on the Proposed Development in the breeding season would be predicted to originate from Saltee Islands SPA. During the nonbreeding season, between 1.6% and 4.5% of the adult guillemots recorded on the Proposed Development in the breeding season would be predicted to originate from Saltee Island SPA (25,581 divided by 563,371 and 1,567,463 respectively).

CONSTRUCTION

6.8.4.50 ~~6.8.4.46~~ In order to calculate the number of guillemots that potentially would be at risk of displacement from the Cable Corridor and Working Area during the cable laying process, the density of this species in the Cable Corridor and Working Area (corridor 1 and corridor 2) was estimated from the site-specific surveys carried out for the Proposed Development (Appendix 12.1: Offshore Ornithology Technical Report - Overview).

6.8.4.51 ~~6.8.4.47~~ During the breeding season (March to July), the seasonal peak density in corridor 1 was ~~2.9~~15.2 birds/ km^2 and in corridor 2 was ~~3.3~~10.5 birds/ km^2. Within a 2 km radius of disturbance

around a cable laying vessel (12.56 km^2), ~~22~~114 individuals (~~2.9~~15.2 x 12.56 x 60%) could be at risk of displacement along corridor 1 and ~~25~~79 (~~3.3~~10.5 x 12.56 x 60%) along corridor 2, ~~47~~193 in total. This means that, across all populations, ~~0.47~~1.93 individuals (1%) would be at risk of mortality due to cable installation, of which ~~15% (0.07~~14.1(0.27 individuals) would be at risk from Saltee Islands SPA.

6.8.4.52 ~~6.8.4.48~~ During the nonbreeding season (August to February), the seasonal peak density in corridor 1 was ~~27.3~~25.4 birds/ km^2 and in corridor 2 was ~~12.6~~12.2 birds/ km^2. Within a 2 km radius of disturbance around a cable laying vessel (12.56 km^2), ~~206~~191 individuals (~~27.3~~25.4 x 12.56 x 60%) could be at risk of displacement along corridor 1 and ~~95~~92 (~~12.6~~12.2 x 12.56 x 60%) along corridor 2, ~~301~~283 in total. This means that, across all populations, ~~3~~2.83 individuals (1%) would be at risk of mortality due to cable installation, of which between 1.6% and ~~4.6% (~~Table 6.~~33~~49~~), 0.05 and 0.14~~ 4.5% (Table 6.~~33~~49), 0.04 and 0.13 individuals, would be at risk from Saltee Islands SPA.

6.8.4.53 ~~6.8.4.49~~ Thus, summing the breeding season (~~0.07~~0.27) and maximum nonbreeding season (~~0.14~~0.13) construction displacement mortalities, the potential annual mortality on the Saltee Islands SPA guillemot population would be ~~0.21~~0.4 adults.

6.8.4.54 ~~6.8.4.50~~ The background adult mortality rate for guillemot is 0.061 (Horswill and Robinson, 2015), which indicates that the natural mortality for this SPA population would be 1,577 individuals (25,851 x 0.061). Addition of a maximum of ~~0.21~~0.4 individuals to this would increase the background rate by ~~0.01~~0.02%. This is a very small increase and would be undetectable against natural variations. The threshold below which increases in background mortality are considered to be undetectable against natural variations is 1% (Parker et al. 2022).

6.8.4.55 Since the additional mortality based on a reasonable but precautionary assessment is far below the 1% threshold, even if the impact was substantially greater than this (already precautionary) estimate, the impact would still most likely fall well below the 1% threshold, and so there is no reasonable scientific doubt as to the absence of an effect.

6.8.4.56 ~~6.8.4.51~~ **Therefore, on this basis there will be no AEoI on the guillemot feature of Saltee Island SPA, as defined by the ~~COs~~Conservation Objectivess of the site, as a result of construction displacement effects considered above, from Project Design Option 1.**

6.8.4.57 ~~6.8.4.52~~ **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

OPERATIONAL

6.8.4.58 ~~6.8.4.53~~ As discussed above (Section ~~6.8.2.27~~ 6.8.2.27), the assumption for guillemots is that displacement from windfarms occurs at a constant level to a distance of 2 km, in line with guidance (SNCBs 2022) and that within this area, ~~30% to 70~~following NatureScot guidance, 60% of birds will be displaced ~~and~~of which mortality ~~of displaced birds will~~would be between 3% and 5% in the breeding season and between 1% and ~~10~~3% in the nonbreeding seasons, with evidence based rates of 50% displaced and 1% mortality (MacArthur Green 2019).

6.8.4.59 ~~6.8.4.54~~ During the breeding season (March to July), the seasonal peak abundance in the Array Area and 2 km buffer was ~~3,033~~9,010 birds. Thus, in total, between ~~9~~162 (~~30~~60% displaced and ~~1~~3% mortality) and ~~212~~270 (~~70~~60% displaced, ~~10~~5% mortality) could be at risk of displacement mortality, with the ~~evidence based~~evidence-based prediction of ~~15~~45 (50% displaced and 1% mortality). Of these, ~~15.0% (~~Table 6.~~32~~48~~) which equate to 1.3, 2.2 and 32 individuals at the respective rates,~~57% would be adults (Furness 2015) and 14.1% would be at risk from Saltee Islands SPA (Table 6.~~32~~48) which combined equate to 3.6, 13.0 and 21.7 individuals at the respective rates.

6.8.4.60 ~~6.8.4.55~~ During the nonbreeding season (August to February), the seasonal peak abundance in the Array Area and 2 km buffer was ~~5,079~~3,991 birds. Thus, in total, between ~~15~~24 (~~30~~60% displaced and 1% mortality) and ~~356~~72 (~~70~~60% displaced, ~~10~~3% mortality) could be at risk of displacement mortality, with the ~~evidence based~~evidence-based prediction of ~~25~~20 (50% displaced and 1% mortality). Of these, between 1.6% and ~~4.6% (~~Table 6.~~33~~49~~) which equate to maximums of 0.7, 1.1 and 16.4 individuals at the respective rates,~~4.5% would be adults at risk from Saltee Islands SPA (Table 6.~~33~~49) which equate to maximums of 0.9, 1.1 and 3.2 individuals at the respective rates.

6.8.4.61 ~~6.8.4.56~~ Thus, summing the breeding season (~~1.3~~3.6, ~~2.2, 32~~13.0 and 21.7) and nonbreeding season (~~0.7~~0.9, ~~1.1, 16.4~~11.1 and 3.2) operational displacement mortalities, the potential annual mortality on the Saltee Islands SPA guillemot population would be ~~2.0, 3.3 and 48.4~~4.5, 14.1and 24.9 adults, respectively.

6.8.4.62 ~~6.8.4.57~~ The background adult mortality rate for guillemot is 0.061 (Horswill and Robinson, 2015), which indicates that the natural mortality for this SPA population would be 1,577 individuals (25,851 x 0.061). Addition of individuals subject to displacement mortality would increase the background rate by ~~0.13~~0.28%, ~~0.2~~0.89% and ~~3.1~~1.58%. While the most precautionary displacement rates result in an increase in background mortality above the 1% threshold of detectability (Parker *et al.* 2022), this is not the case at the evidence based rates (50% displaced and 1% mortality).

6.8.4.63 Since the additional mortality based on a reasonable but precautionary assessment is far below the 1% threshold, even if the impact was substantially greater than this (already precautionary) estimate, the impact would still most likely fall well below the 1% threshold, and so we can be confident that there is no reasonable scientific doubt as to the absence of an effect.

6.8.4.64 ~~6.8.4.58~~ **Therefore, on this basis there will be no AEoI on the guillemot feature of Saltee Island SPA, as defined by the COs of the site, as a result of operational displacement effects considered above, from Project Design Option 1.**

6.8.4.65 ~~6.8.4.59~~ **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

Razorbill

6.8.4.66 ~~6.8.4.60~~ The conservation objective for razorbill in Saltee Islands SPA can be found in Table 5.2.

6.8.4.67 ~~6.8.4.61~~ See section 6.7.2.18 for a summary of relevant razorbill ecology~~.~~ and section 6.8.2.53 for assessment methods..

6.8.4.68 ~~6.8.4.62~~ The Saltee Islands SPA population of razorbill at designation was 5,200 individuals. More recent surveys have reported 6,519 (Burnell et al. 2023).

6.8.4.69 ~~6.8.4.63~~ On the basis of the apportioning (Table 6.~~34~~50~~), 21.6~~Table 6.~~34~~50), 16.7% of the adult razorbills recorded on the Proposed Development in the breeding season would be predicted to originate from Saltee Islands SPA. During the nonbreeding season, between 1.2% and 6.8% of the adult razorbills recorded on the Proposed Development in the breeding season would be predicted to originate from Saltee Islands SPA (6,519 divided by 96,268 and 554,179 respectively).

CONSTRUCTION

6.8.4.70 ~~6.8.4.64~~ In order to calculate the number of razorbills that potentially would be at risk of displacement from the Cable Corridor and Working Area during the cable laying process, the density of this species in the Cable Corridor and Working Area (corridor 1 and corridor 2) was estimated from the site-specific surveys carried out for the Proposed Development (NIS Volume III, Appendix 12.1: Offshore Ornithology Technical Report – Overview (Revised March 2026)).

6.8.4.71 ~~6.8.4.65~~ During the breeding season (April to July), the seasonal peak density in corridor 1 was ~~0.3~~1.24 birds/ km^2 and in corridor 2 was ~~0.3~~0.51 birds/ km^2. Within a 2 km radius of disturbance around a cable laying vessel (12.56 km^2), ~~2~~9.3 individuals (~~0.3~~1.24 x 12.56 x 60%) could be at risk of displacement along corridor 1 and ~~2~~3.8 (0.3 x 12.56 x 60%) along corridor 2, ~~4~~13.1 in total. This means that, across all populations, ~~0.04~~0.13 individuals (1%) would be at risk of mortality due to cable installation, of which ~~21.6% (0.001~~16.7 (0.02 individuals) would be at risk from Saltee Islands SPA.

6.8.4.72 ~~6.8.4.66~~ During autumn migration (August to October), at a seasonal peak density of ~~3.2~~2.17 birds/ km2 (corridor 1) and ~~4.5~~2.69 birds/ km^2 (corridor 2), with a 2 km radius of disturbance around a cable laying vessel (12.56 km^2), a maximum of ~~48~~16.3 individuals (~~3.2~~2.17 x 12.56 x 60%) could be at risk of displacement along corridor 1 and ~~34~~20.3 (~~4.5~~2.69 x 12.56 x 60%) along corridor 2, ~~82~~36.6 in total. This means that ~~0.82~~0.37 individuals (1%) are at risk of mortality due to cable installation.

6.8.4.73 ~~6.8.4.67~~ During the winter period (November and December), at a seasonal peak density of ~~9.5~~8.2 birds/ km^2 (corridor 1) and ~~5.0~~4.9 birds/ km^2 (corridor 2), with a 2 km radius of disturbance around a cable laying vessel (12.56 km^2), a maximum of ~~72~~61.8 individuals (~~9.5~~8.2 x 12.56 x 60%) could be at risk of displacement along corridor 1 and ~~38~~36.9 (~~5.0~~4.9 x 12.56 x 60%) along corridor 2, ~~110~~98.7 in total. This means that ~~1.1~~1.0 individuals (1%) are at risk of mortality due to cable installation.

6.8.4.74 ~~6.8.4.68~~ During the spring migration (January to March), at a seasonal peak density of ~~0.7~~0.66 birds/ km^2 (corridor 1) and ~~0.3~~1.8 birds/ km^2 (corridor 2), with a 2 km radius of disturbance around a cable laying vessel (12.56 km^2), a maximum of ~~five~~5 individuals (~~0.7~~0.66 x 12.56 x 60%) could be at risk of displacement along corridor 1 and ~~two~~13.5 (0.3 x 12.56 x 60%) along corridor 2, ~~seven~~18.5 in total. This means that ~~0.07~~0.18 individuals (1%) are at risk of mortality due to cable installation.

6.8.4.75 ~~6.8.4.69~~ Of the total autumn, winter and spring mortalities, the proportion originating from the Saltee ~~Islands~~Island SPA population was estimated to be between 1.1% and 6.8%. Thus, of the total nonbreeding construction displacement mortality ~~2.0~~of 1.6 (~~0.82~~0.37, ~~1.1~~1.0, ~~0.07~~0.18), a maximum of ~~0.14~~0.11 of the nonbreeding mortalities would be apportioned to the Saltee ~~Islands~~Island SPA.

6.8.4.76 ~~6.8.4.70~~ Thus, summing the breeding season (0.02) and nonbreeding season (~~0.14~~0.114) construction displacement mortalities, the potential annual mortality on the Saltee ~~Islands~~Island SPA razorbill population would be ~~0.16~~0.13 adults.

6.8.4.77 ~~6.8.4.71~~ The background adult mortality rate for razorbill is 0.105 (Horswill and Robinson, 2015), which indicates that the natural mortality for this SPA population would be 684 individuals (6,519 x 0.105). Addition of a maximum of ~~0.16~~0.13 individuals to this would increase the background rate by 0.02%. This is a very small increase and would be undetectable against natural variations. The threshold below which increases in background mortality are considered to be undetectable against natural variations is 1% (Parker et al. 2022).

6.8.4.78 Since the additional mortality based on a reasonable but precautionary assessment is far below the 1% threshold, even if the impact was substantially greater than this (already precautionary) estimate, the impact would still most likely fall well below the 1% threshold, and so we can be confident that there is no reasonable scientific doubt as to the absence of an effect.

6.8.4.79 ~~6.8.4.72~~ **Therefore, on this basis there will be no AEoI on the razorbill feature of Saltee Island SPA, as defined by the COs of the site, as a result of construction displacement effects considered above, from Project Design Option 1.**

6.8.4.80 ~~6.8.4.73~~ **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

6.8.4.81 ~~6.8.4.74~~ The assumption for razorbills is that displacement from windfarms occurs at a constant level to a distance of 2 km in line with guidance (SNCBs 2022) and that within this area, ~~30% to 70~~following NatureScot guidance, 60% of birds will be displaced ~~and~~of which mortality ~~of displaced birds will~~would be between 3% and 5% in the breeding season and between 1% and ~~10~~3% in the nonbreeding seasons.

6.8.4.82 ~~6.8.4.75~~ Empirical evidence indicates that auk (guillemots and razorbills) displacement from windfarms is likely to be lower than ~~70~~60%, although pre- and post-construction monitoring data have yielded variable results (see Section 6.8.2.41 for a discussion).

6.8.4.83 ~~6.8.4.76~~ The ~~10~~5% mortality rate for auks is unconfirmed and this magnitude of impact is not supported in the literature. Given that this is equivalent to half of the existing natural adult annual mortality for razorbill from all other sources of mortality (baseline mortality is 10.5%; Horswill and Robinson 2015), it is highly improbable that such an effect would occur. Mortality due to displacement might arise if displacement increased competition for resources in the remaining areas of auk habitat outside the windfarm. However, it should be recognised that the mortality rate due to displacement may well be 0% since the increase in density of auks outside the windfarm area will be negligible (because the rest of the available habitat is vast) and is very unlikely to be as high as ~~10~~5%.

6.8.4.84 ~~6.8.4.77~~ MacArthur Green (2019) undertook a review of available evidence for auk displacement and concluded that precautionary rates of displacement and mortality from operational windfarms would be 50% and 1% respectively. Thus, this assessment presents displacement in the range from ~~30~~50% displaced and 1% mortality ~~to 70~~to60% displaced and ~~10~~3%-5% mortality (breeding season) and 1%-3% mortality (nonbreeding seasons), with a focus on the evidence-based rates of 50% displaced and 1% mortality.

6.8.4.85 ~~6.8.4.78~~ During the breeding season (April to July), the seasonal peak abundance in the Array Area and 2 km buffer was ~~211~~488 birds. Thus, in total, between ~~1~~8.8 (~~30~~60% displaced and ~~1~~3% mortality) and ~~15~~14.6 (~~70~~60% displaced, ~~10~~5% mortality) could be at risk of displacement mortality, with the evidence-based prediction of ~~1~~2.4 (50% displaced and 1% mortality). Of these, ~~21.6% (~~Table 6.~~34~~50~~) which equate to 0.22, 0.22 and 3.2 individuals at the respective rates,~~57% would be adults (Furness 2015) and, 16.7% would be at risk from Saltee Islands SPA (Table 6.~~34~~50) equate to 0.22, 0.84 and 1.39 individuals at the respective rates.

6.8.4.86 ~~6.8.4.79~~ During the autumn season (August to October), the seasonal peak abundance in the Array Area and 2 km buffer was ~~2,319~~2,570 birds. Thus, in total, between ~~7~~15.4 (~~30~~60% displaced and 1% mortality) and ~~162~~46.3 (~~70~~60% displaced, ~~10~~3% mortality) could be at risk of displacement mortality, with the ~~evidence based~~evidence-based prediction of ~~12~~12.8 (50% displaced and 1% mortality).

6.8.4.87 ~~6.8.4.80~~ During the winter (November and December), the seasonal peak abundance in the Array Area and 2 km buffer was ~~2,072~~2,558 birds. Thus, in total, between ~~6~~15.3 (~~30~~60% displaced and 1% mortality) and ~~145~~46.0 (~~70~~60% displaced, ~~10~~3% mortality) could be at risk of displacement mortality, with the ~~evidence based~~evidence-based prediction of ~~10~~12.8 (50% displaced and 1% mortality).

6.8.4.88 ~~6.8.4.81~~ During the spring season (January to March), the seasonal peak abundance in the Array Area and 2 km buffer was 3,711 birds. Thus, in total, between ~~11~~22 (~~30~~60% displaced and 1% mortality) and ~~260~~66.8 (~~70~~60% displaced, ~~10~~3% mortality) could be at risk of displacement mortality, with the evidence based prediction of ~~19~~18.6 (50% displaced and 1% mortality).

6.8.4.89 ~~6.8.4.82~~ Of the total autumn, winter and spring mortalities, the proportion originating from the Saltee Islands SPA population was estimated to be between 1.1% and 6.8% (6,519 adults divided into 554,179 and 96,268). Thus, of the total nonbreeding operational displacement mortality of ~~24~~44.2, ~~41~~52.7 and ~~567~~159.1 (at each combination of rates respectively), between ~~1.6~~3.0 (~~24~~44.2

x 6.8%) and ~~38.5~~26.6 (~~567~~159.1 x 6.8%) of the nonbreeding mortalities would be apportioned to the Saltee ~~Islands~~Island SPA.

~~6.8.4.83 Thus, with the addition of the breeding season mortality the annual mortality on the Saltee Islands SPA razorbill population would be between 1.82 and 41.7, with the evidence-based estimate of 3.0.~~

6.8.4.90 Thus, summing the breeding season mortality (0.22, 0.84 and 1.39) and the nonbreeding season mortality (3.0, 3.6 and 26.6) the annual mortality on the Saltee Island SPA razorbill population would be 3.22, 4.44 and 28.0 adults respectively

6.8.4.91 ~~6.8.4.84~~ The background adult mortality rate for razorbill is 0.105 (Horswill and Robinson, 2015), which indicates that the natural mortality for this SPA population would be 684 individuals (6,519 x 0.105). Addition of individuals subject to displacement mortality would increase the background rate by ~~0.2~~0.47%, ~~0.4~~0.65% and ~~6.1~~4.1%. While the most precautionary displacement rates result in an increase in background mortality above the 1% threshold of detectability (Parker et al. 2022), this is not the case at the evidence-based rates (50% displaced and 1% mortality).

6.8.4.92 Since the additional mortality based on a reasonable but precautionary assessment is far below the 1% threshold, even if the impact was substantially greater than this (already precautionary) estimate, the impact would still most likely fall well below the 1% threshold, and so we can be confident that there is no reasonable scientific doubt as to the absence of an effect.

6.8.4.93 ~~6.8.4.85~~ **Therefore, on this basis there will be no AEoI on the razorbill feature of Saltee Island SPA, as defined by the COs of the site, as a result of operational displacement effects considered above, from Project Design Option 1.**

6.8.4.94 ~~6.8.4.86~~ **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

6.8.5 Skerries Island SPA

Herring Gull

6.8.5.1 The conservation objective for herring gull in Skerries Islands SPA can be found in Table 5.2.

6.8.5.2 See section 6.7.2.14 for a summary of relevant herring gull ecology.

6.8.5.3 The only potential impacts are present within the operational and maintenance phase and so therefore the other phases of development are not considered within this qualifying features assessment.

6.8.5.4 The Skerries Islands SPA population of herring gull at designation was 250 pairs which equates to a breeding adult population of 500 individuals. No update is available for this site (Burnell *et al.* 2023).

6.8.5.5 Herring gull collisions were only predicted to occur in ~~two~~five months, February, March, April, August and November, with none in the core breeding season months (May – July), therefore there is no breeding season connectivity between the Skerries Islands SPA and the Proposed Development.

6.8.5.6 The total nonbreeding season collision estimates (i.e. not apportioned among SPA colonies) were ~~1.3~~2.6 (Project Design Option 1a), ~~1.5~~2.9 (Project Design Option 1b) and ~~1.3~~2.8 (Project Design Option 2). The most recent estimate of the herring gull population from Northern Irish and Irish colonies with connectivity to the Irish Sea (from Antrim to Waterford) is 8,635 AON (Burnell *et al.* 2023). Birds from Skerries Islands SPA would make up 2.9% of this population, therefore 2.9% of the total collisions would equate to ~~0.04~~0.084 individuals. The adult mortality rate for herring gull is 0.166 (Horswill and Robinson 2015). The background mortality of herring gull from Skerries

Islands SPA would therefore be 83 individuals. Addition of the apportioned mortality to this would increase the rate by ~~0.05~~0.1% which would be undetectable against background variations (Parker *et al.* 2022).

6.8.5.7 Since the additional mortality based on a reasonable but precautionary assessment is far below the 1% threshold, even if the impact was substantially greater than this (already precautionary) estimate, the impact would still most likely fall well below the 1% threshold, and so we can be confident that there is no reasonable scientific doubt as to the absence of an effect.

6.8.5.8 ~~6.8.5.7~~ **Therefore, on this basis there will be no AEoI on the herring gull feature of Skerries Island SPA, as defined by the COs of the site, as a result of collision effects considered above, from Project Design Option 1.**

6.8.5.9 ~~6.8.5.8~~ **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

6.8.6 The Murrough SPA

Red-throated diver

6.8.6.1 The conservation objective for red-throated diver in the Murrough SPA can be found in Table 5.2.

6.8.6.2 See section 6.7.2.21 for a summary of relevant red-throated diver ecology.

6.8.6.3 The Murrough SPA population of red-throated diver is reported as 91 in September and 131 in November/December (NPWS, 2024f). Prior to that the 5 year mean peak count was reported as 32 (The Murrough SPA synopsis [8]).

6.8.6.4 Red-throated divers are considered to have a very high general sensitivity to disturbance and displacement and they are prone to avoiding disturbed areas such as shipping lanes, as well as offshore windfarms (Garthe and Hüppop 2004; Bellebaum et al. 2006; Petersen et al. 2006; Schwemmer et al. 2011 Furness and Wade 2012; Furness et al. 2013; Bradbury et al. 2014; Percival 2014; Dierschke et al., 2017; Mendell et al. 2019; Irwin et al. 2019).

6.8.6.5 A detailed review of the evidence for displacement of red-throated divers from offshore windfarms, and the likely effects on displacement on population mortality rates, was included in Norfolk Vanguard Ltd (2019). Based on this review, most studies found a marked decrease (around 90%) in red-throated diver densities within operational windfarms when compared to pre-construction data, however the distance outside the windfarm over which diver densities were reduced was more variable. At the extremes, Percival (2013) found no reduction in diver density outside Thanet offshore windfarm even within 500m of the outer wind turbines, whereas Mendel et al. (2019) found a statistically detectable reduction in density up to 16km from the outer wind turbines. The source of this variation is uncertain but may relate to ecological conditions or to the seascape/landscape of the site. Behaviour may vary seasonally, for example, depending on ecological constraints at different times of year, such as may arise during flight-feather moult when birds may become flightless. Birds might show greater avoidance distances where they are unconstrained. At sites where suitable or optimal habitat is limited, birds might show lower displacement distances because of constraints imposed by habitat availability. Alternatively, divers may show stronger avoidance of visible structures at sea where these are against an 'empty' background seascape. Where structures are in front of a cluttered background of coast, perhaps especially a coast with industrial development, wind turbines may appear less prominent and/or may be seen by divers as less threatening. The largest distances from offshore windfarms over which diver densities were reduced were in the German Bight, a very large area of open sea

[8] https://www.npws.ie/sites/default/files/protected-sites/synopsis/SY004186.pdf

far from the coast. The smallest displacement distances from offshore windfarms were at sites close to the UK coast where anthropogenic influences on the coastal scenery are high (e.g. Thanet wind farm and Kentish Flats wind farm) (MacArthur Green 2019a).

6.8.6.6 Spatial modelling analysis of red-throated diver data in the Outer Thames area over a 20 year period during which several offshore wind farms were constructed was provided as part of the East Anglia ONE North application[9]. This study, which compared distributions before and after the construction of the wind farms, found a maximum reduction in diver density in the wind farms of 33% which declined to zero at around 7km.

6.8.6.7 Therefore, since there is considerable variation in the reported distances over which diver densities appear to be influenced by offshore wind farms, the UK SNCBs advise that a precautionary buffer of 10 km is appropriate for considering the potential range of effect.

6.8.6.8 Therefore, the potential impact on the SPA is not a result of displacement from the Proposed Development area itself, nor from within the 10 km buffer of the Array, but rather that the spatial distribution of red-throated divers within the SPA in the area of overlap between the 10 km buffer and the SPA may be affected.

6.8.6.9 The area of the overlap between the 10 km buffer and the SPA is 5.3 km^2 while the total area of the SPA is 97.7 km^2. Thus, the overlap represents 5.4% of the SPA area, and is located in the south-eastern corner of the SPA (i.e. the seaward boundary). Calculations of the density of red-throated divers in the SPA and how that might change if birds avoid the overlap area are provided in Table 6.54: The Murrough SPA red-throated diver abundance and estimated density changes due to the Proposed Development. The Murrough SPA has an area of 97.7 km^2 and the overlap with the 10km buffer is 5.3km^{2}Table 6.54.

Table 6.54: The Murrough SPA red-throated diver abundance and estimated density changes due to the Proposed Development. The Murrough SPA has an area of 97.7 km^2 and the overlap with the 10km buffer is 5.3km^2

Data source	Red-throated diver population estimate	Density across SPA (population/ area)	Abundance in overlap zone	Density in reduced area (SPA minus overlap)	Increase in density (km2)	Increase in density (%)
SPA original citation	32	0.327	1.75	0.346	0.019	5.8%
NPWS 2024	91	0.931	4.96	0.985	0.053	
	131	1.341	7.15	1.418	0.077	

6.8.6.10 If it is assumed that red-throated divers are uniformly distributed through the SPA and that they will completely avoid the overlap area and relocate within the SPA, the density across the remainder of the SPA would increase by up to 0.077 birds/km2, which would be a 5.8% increase. However, it is clear from the ObSERVE data (Jessopp et al. 2018) that most divers were observed along the coast with very few recorded at the outer edge of the SPA in the region of the overlap. Furthermore, it is unlikely that the overlap area would be completely avoided, but at worst would have reduced densities. The range of densities reported by Jessopp et al. (2018) in the area of

[9] https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010077/EN010077-005242-ExA.AS-2.D11.V5%20EA1N&EA2%20Displacement%20of%20red-throated%20divers%20in%20the%20Outer%20Thames%20Estuary.pdf

the SPA was up to 2-5 birds/km2. Thus, even the highest increase in density, from 1.34 to 1.42 birds per km2 would not elevate the density above observed levels.

6.8.6.11 The above calculations can be considered highly precautionary and represent the most precautionary magnitude of impact. The specific conservation objective to which this potential impact relates states that the target is to ensure there is a:

> *Sufficient number of locations, area, and availability (in terms of timing and intensity of use) of suitable habitat to support the population target (NPWS 2024)*

6.8.6.12 Since even the most precautionary scenario will result in a small re-distribution which would not increase density in the remainder of the SPA above recorded levels it can be concluded that this effect would be undetectable and we can be confident that there is no reasonable scientific doubt as to the absence of an effect.

6.8.6.13 **Therefore, on this basis there will be no AEoI on the red-throated diver feature of The Murrough SPA, as defined by the COs of the site, as a result of operational displacement effects considered above, from Project Design Option 1.**

6.8.6.14 **Based on the representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

6.8.7 ~~6.8.6~~ Wicklow Head SPA

Kittiwake

6.8.7.1 ~~6.8.6.1~~ The conservation objective for kittiwake in Wicklow Head SPA can be found in Table 5.2.

6.8.7.2 ~~6.8.6.2~~ See section 6.7.2.7 for a summary of relevant kittiwake ecology.

6.8.7.3 ~~6.8.6.3~~ The Wicklow Head SPA population of kittiwake at designation was 956 AON which equates to a breeding adult population of 1,912. More recent surveys have reported ~~773~~851 AON (~~Burnell *et al.* 2023~~ABPWP2 2024)).

6.8.7.4 ~~6.8.6.4 Using the evidence-based rates~~As discussed in paragraphs 6.8.1.5 to 6.8.1.9, the total kittiwake breeding season collision estimate for ~~the~~ Project Design Option 1a was ~~16.7~~estimated to be 5.0, for Project Design Option 1b was ~~18.8~~5.8 and for Project Design Option 2 was ~~16.8.~~ 5.6 (Appendix 12.05 Offshore Ornithology Technical Report – Collision Risk Modelling Results).

6.8.7.5 The total kittiwake nonbreeding season collision ~~estimates~~estimate for ~~the~~ Project Design Option 1a was ~~estimated to be 170.1~~25.3, for Project Design Option 1b was ~~190.3~~28.7 and for Project Design Option 2 was ~~172.0~~27.6 (Appendix 12.5 Offshore Ornithology Technical Report – Collision Risk Modelling Results).

6.8.7.6 ~~6.8.6.5~~ The percentage of kittiwakes on the Proposed Development predicted to originate from Wicklow Head SPA in the breeding season was ~~58.1% (~~Table 6.~~30~~44~~). Application of this rate to the total breeding season collision predictions indicated that 9.7 (Project Design Option 1a), 10.9 (Project Design Option 1b) and 9.7 (Project Design Option 2) collisions would be apportioned to the SPA.~~

~~6.8.6.6~~ 56.1% (Table 6.~~30~~44). As the ~~As these~~ collision predictions are derived from at sea survey data, they include all age classes so it is also necessary to estimate what proportion of these are adults. Kittiwake populations consist of an estimated 53% adults~~,~~ with the remaining 47% distributed among sub-adult ~~age~~ classes (Furness, 2015). ~~Thus, using these age class proportions the Wicklow Head SPA adult collisions in the~~Application of both the SPA percentage and the adult percentage to the total breeding season ~~would be 5.1~~collision predictions indicates 1.5 (Project Design Option 1a), ~~5.8~~ 1.7(Project Design Option 1b) and ~~5.1~~1.7 (Project Design Option 2) breeding season collisions would be apportioned to the SPA.

6.8.7.7 ~~6.8.6.7~~ Of the total nonbreeding season ~~total kittiwake collision estimates, summing the autumn and spring BDMPS periods, were 170.1 (Project Design Option 1a), 190.3 (Project Design Option 1b) and 172.0 (Project Design Option 2).~~collisions, the proportion originating from the Wicklow Head SPA population was estimated to be between ~~0.19~~0.21% and ~~0.37% (1,546~~0.41% (1,702 adults divided into ~~818,181~~822,927 and 418,196~~;~~ Table 6.~~31~~45, respectively). Thus, ~~a maximum of 0.6~~between 0.05 and 0.10 (Project Design Option 1a), ~~0.7~~0.05 and 0.12 (Project Design Option 1b) and ~~0.6~~0.05 and 0.11 (Project Design Option 2) of the nonbreeding collisions would be apportioned to the Wicklow Head SPA (Table 6.55).

6.8.7.8 Thus, summing the breeding season and nonbreeding seasons the maximum annual mortality was between 1.5 and 1.8 for all Design Options.

Table 6.55 Kittiwake collisions and apportioned mortalities to the Wicklow Head SPA B = breeding, NB = nonbreeding

Design option	Total collisions		B apportioning (%)		NB apportioning (%)		SPA collisions (B=Total B x SPA% x adult %) (NB= Total NB x SPA Low/High %)			
	B	NB	SPA	Adults	SPA Low estimate	SPA High estimate	B	NB		Total
								Low	High	
1a	5.0	25.3	56.1	53.0	0.21 (=1,702/ 822,927)	0.41 (=1,702/ 418,196)	1.49	0.05	0.10	**1.5-1.6**
1b	5.8	28.7					1.72	0.06	0.12	**1.8-1.8**
2	5.6	27.6					1.67	0.06	0.11	**1.7-1.8**

~~6.8.6.8 Thus, summing the breeding season collision estimates 5.1 (Project Design Option 1a), 5.8 (Project Design Option 1b), and 5.1 (Project Design Option 2) and nonbreeding season collision estimates 0.6 (Project Design Option 1a), 0.7 (Project Design Option 1b) and 0.6 (Project Design Option 2), the annual adult mortality for Wicklow Head SPA would be 5.7 (Project Design Option 1a), 6.5 (Project Design Option 1b) and 5.7 (Project Design Option 2).~~

6.8.7.9 ~~6.8.6.9~~ The background adult mortality rate for kittiwake is 0.146 (Horswill and Robinson 2015), which indicates that the natural mortality for the SPA population using the most recent count (~~773~~851 AON~~, Cummins *et al.*, 2019~~) would be ~~226~~248. Addition of ~~5.7~~1.5 to ~~6.5~~1.8 adults to these would increase the background rate of the designated population by ~~2.5~~0.6% to ~~2.8~~0.7%. The threshold below which increases in background mortality are considered to be undetectable against natural variations is 1% (Parker *et al.* 2022).~~ Therefore~~

6.8.7.10 Since the additional mortality based on a reasonable but precautionary assessment is below the 1% threshold, there is little risk of an effect on the population. However, given the proximity of the Proposed Development to the SPA and that the upper end of the range of predicted mortalities approaches the 1% threshold (0.72%), additional consideration of the potential impact on the SPA population has been undertaken using the results from a kittiwake population model of the Wicklow Head SPA population (Volume III, Technical Appendix 12.10 Offshore Ornithology: Kittiwake Population Viability Analysis).

6.8.7.11 ~~6.8.6.10~~ The kittiwake population viability analysis (PVA) was run both with the incorporation of density dependent regulation (to simulate the natural feedback processes by which wild populations are regulated) and without this regulation (density independent). The justification for using the results of density independent models, rather than those from more realistic density dependent ones, is typically because it is considered there is insufficient information available to define the relationships between a population's size and the rates of survival and reproduction (which are expected to vary as levels of competition among members of the population for limiting resources varies). However, this situation does not prevent reasonable assumptions being made about the action of density dependent regulation, for example derived from similar species or alternative locations, with which to parameterise a population model. Furthermore, natural populations of seabirds will, with rare exceptions, almost never be expected to change in size without experiencing density dependent regulation. In that sense, a density independent model for a seabird population can be considered to be the *most* unrealistic form of population model. Thus, by presenting results from both a density independent model and a precautionary density dependent one (i.e. with the feedback set to be relatively weak), the results are intended to bracket the range of expected responses, albeit that (for the reasons outlined above and

discussed in more detail in Volume III, Technical Appendix 12.10 Offshore Ornithology: Kittiwake Population Viability Analysis) the density dependent results are expected to be more appropriate.

6.8.7.12 ~~6.8.6.11~~ The model results~~,~~ are presented as comparisons of the predicted population size and population growth rate between unimpacted (baseline) model runs and impacted ones, presented as proportions and referred to as counterfactuals: CPS (counterfactual of population size) and CPGR (counterfactual of population growth rate)~~, are provided in **Error! Unknown switch argument.**~~.

6.8.7.13 As well as density dependent and independent runs, each version of the model was also run with two alternative productivity rates. The first was calculated as the average of all the years of available productivity data (2001-2010, 2018-2024), giving a value of 0.677 and the second used just the most recent five-year period (2020-2024) and gave a value of 0.582. It is not straightforward to determine which of these is more appropriate for making predictions of future population change, since they represent different potential situations. However, while the two rates generate different predictions for the future population size, the counterfactual metrics are in fact almost identical. In other words, while the different productivity rates predict different rates of population growth, the comparison of that growth with and without the additional wind farm impact is almost completely unaffected by the productivity rate used: counterfactual differences were less than 1/100th of a percent different between models with a productivity of 0.677 and ones with 0.582 (see Volume III, Technical Appendix 12.10 Offshore Ornithology: Kittiwake Population Viability Analysis for details). It therefore makes no difference which value is used when using the PVA to consider the potential impacts of ABWP2.

6.8.7.14 ~~6.8.6.12~~ Due to the differences in how population change is predicted using density independent and density dependent models, it is also appropriate to give greater weight to a different counterfactual for each type. Density independent population projections undergo exponential increase, so the baseline and impacted populations will diverge by an ever-increasing margin as the duration of the simulation increases. However, the growth rate of the two projections will be constant, hence the CPGR is more appropriate than the CPS. In contrast, density dependent projections will stabilise around a level, with no net growth or decline. Thus, there is little to be gained from comparing the growth rate of baseline and impacted runs, since these will be the same in both (once the populations have settled to their new levels). However, the size of the population will differ. Hence, for density dependent simulations the CPS is more appropriate than the CPGR. The relevant metrics, in line with the above considerations, have been highlighted in the results (Table 6.~~36~~56)

Table 6.~~36~~56: Summary outputs from Wicklow Head SPA kittiwake population model, mean values (and 95% confidence intervals). Shaded cells indicate the most appropriate metric for either density independent (CPGR) or density dependent (CPS) models. All values taken from the lower productivity (0.582) model (i.e. more precautionary).

Impact magnitude (annual adult collisions)	Model type	Counterfactual of population size (CPS)	Counterfactual of population growth rate (CPGR)
~~4~~1	Density independent	~~0.9130 (0.7820 – 1.0630~~0.9766 (0.8249-1.1468)	~~0.9971 (0.9928 – 1.0013~~0.9993 (0.9944-1.0038)
	Density dependent	~~0.9675 (0.8664 – 1.0356~~0.9923 (0.9246-1.0634)	~~0.9990 (0.9959 – 1.0019~~0.9997 (0.9968-1.0027)
~~5~~2	Density independent	~~0.8920 (0.7721 – 1.0368~~0.9529 (0.8117-1.1264)	~~0.9964 (0.9922 – 1.0007~~0.9985 (0.9938-1.0033)

Impact magnitude (annual adult collisions)	Model type	Counterfactual of population size (CPS)	Counterfactual of population growth rate (CPGR)
	Density dependent	~~0.9590 (0.8910 – 1.0272~~0.9840 (0.9154-1.0557)	~~0.9986 (0.9958 – 1.0017~~0.9995 (0.9965-1.0024)
~~6~~3	Density independent	~~0.8679 (0.7523 – 1.0050~~0.9311 (0.7870-1.0970)	~~0.9956 (0.9915 – 0.9996~~0.9978 (0.9929-1.0025)
	Density dependent	~~0.9503 (0.8855 – 1.0191~~0.9760 (0.9068-1.0471)	~~0.9984 (0.9954 – 1.0014~~0.9992 (0.9962-1.0022)
~~7~~	~~Density independent~~	~~0.8491 (0.7326 – 0.9889)~~	~~0.9949 (0.9907 – 0.9992)~~
	~~Density dependent~~	~~0.9423 (0.8775 – 1.0097)~~	~~0.9981 (0.9952 – 1.0010)~~

6.8.7.15 ~~6.8.6.13~~ The first aspect to note is that the 95% confidence intervals for annual mortality for both the CPS (counterfactual of population size) and CPGR (counterfactual of population growth rate) for all ~~but three~~ of the 16 results presented include 1.0. Therefore, none of these results would be considered to indicate a statistically significant effect~~, and even those outputs that did not include 1 were very close (e.g. 0.9996).~~.

6.8.7.16 ~~6.8.6.14~~ The CPGR for the density independent models indicates that for a maximum mortality of 3 (greater than the maximum predicted mortality of 1.8), the growth rate would be reduced by ~~no more than 0.5~~0.2% (~~0.9949~~0.9978) and the population would be reduced by no more than ~~5.8~~2.4% (~~0.9423~~0.9760). The latter ~~(density dependent)~~ would indicate the number of pairs, after 36.5 years, might be reduced from ~~773~~850 to ~~728~~830, while the former (density independent) suggests there might be a reduction in the long-term growth rate from ~~0.992 to 0.987~~1.005 (the average observed growth rate between 1999 and 2024) to 1.002 (=~~0.992~~1.005 x ~~0.9949~~0.9978).

6.8.7.17 ~~6.8.6.15~~ As noted above, while the strength and form of density dependence in kittiwake populations is not fully understood, there is strong evidence for density dependence acting on kittiwake populations in terms of their competition for food around the colony (Furness and Birkhead, 1984; Ford *et al.*, 2007, Wakefield *et al.*, 2017), and in terms of colony growth and net immigration rates (Coulson 2011; Miller *et al.*, 2019). There is also strong evidence that kittiwake colonies form a meta-population with high levels of immigration of young birds into colonies (Coulson, 2011). That flow of immigrant birds will also tend to reduce the assessed impact of additional mortality at the focal colony compared with population models (such as used here) that assume each SPA population to be a closed population (Miller *et al.*, 2019). Therefore, the prediction that the population size would be ~~5~~2.4% smaller than it would otherwise have been without the additional mortality, is considered to represent a more reliable guide to the level of potential impact on the population. It is also important to note that the SPA population in 2025 had increased to an estimated 1,077 pairs (NIS Volume III, Appendix 12.16: Wicklow Head Seabird Monitoring (RFI March 2026) and therefore this assessment included an additional source of precaution since the impacts were modelled against a slightly smaller population size of 850 pairs.

~~6.8.6.16 It is also important to note however, that offshore windfarm collision risk assessments include several sources of precaution in the input parameters used and that the magnitude of impact predicted here is very likely to over-estimate the true impacts. If accounting for this over-precaution reduced predicted collisions to around 2 per year, then the predicted effect on the population would be considered undetectable (Parker *et al.* 2022).~~

In addition, the owner and operator of the ABWP1, Arklow Energy Limited has commenced pre-application consultation (Case Reference OC27.321635) with the appropriate local authorities to decommission ABWP1, which has reached the end of its operating life. The ABWP1 team has

begun engaging with the Maritime Area Regulatory Authority (MARA) and is working closely with An Coimisiún Pleanála to agree on the details of the decommissioning and removal works. Based on the fact that the ABWP1 team has commenced the pre-application process for decommissioning we expect ABWP1 to be fully decommissioned before commencement of operation of ABWP2.

6.8.7.18 Discounting the annual predicted collisions for ABWP1 that would be apportioned to Wicklow Head (0.5-1.0 collisions, applying the same rates as used above to the annual total of 17.4; see Volume III, Technical Appendix 12.12: Offshore Ornithology Technical Report - Kittiwake Collision Risk Modelling at ABWP1 (RFI March 2026)) further reduces the predicted impacts on the SPA population.

6.8.7.19 ~~6.8.6.17~~ In view of the predicted small effects on the population status, it is concluded that the population dynamics of the species indicate that any additional mortality due to the Proposed Development will not materially affect the population's ability to maintain itself on a long-term basis as a viable component of its natural habitats; the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

6.8.7.20 ~~6.8.6.18~~ **Overall therefore, on the basis of the precautionary impact predictions and PVA results it is concluded beyond reasonable scientific doubt that there will be no AEoI on the kittiwake feature of Wicklow Island SPA, as defined by the COs of the site, as a result of collision effects considered above, from Project Design Option 1.**

6.8.7.21 ~~6.8.6.19~~ **Based on the ~~increased~~representative risk of effect of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

6.8.8 ~~6.8.7~~ Summary of Stage 2 Appraisal for Sites Screened in for Intertidal and Offshore Ornithology QIs

6.8.8.1 ~~6.8.7.1~~ The potential effects on seabird features of SPAs with connectivity to the Proposed Development have been assessed with respect to collision and displacement risks. Table 6.~~37~~57Table 6.~~37~~57 provides a summary of the assessment and conclusions.

Table 6.~~37~~57: Conclusion for the assessment of potential impacts on intertidal and offshore ornithology receptors

Potential impact	Differences between Project Design Option 1 and 2	Conclusion
Collision risk with operational turbines	No difference between Project Design Option 1 and 2	No AEoI for Howth Head Coast SPA, Ireland's Eye SPA, Lambay Island SPA, Skerries Islands SPA, Saltee Islands SPA and Wicklow Head SPA for any seabird features.
Displacement risk during construction	No difference between Project Design Option 1 and 2	No AEoI for Howth Head Coast SPA, Ireland's Eye SPA, Lambay Island SPA, Skerries Islands SPA, Saltee Islands SPA and Wicklow Head SPA for any seabird features.
Displacement risk during operation	No difference between Project Design Option 1 and 2	No AEoI for Howth Head Coast SPA, Ireland's Eye SPA, Lambay Island SPA, Skerries

Potential impact	Differences between Project Design Option 1 and 2	Conclusion
		Islands SPA, Saltee Islands SPA and Wicklow Head SPA for any seabird features.
Redistribution within SPA	No difference between Project Design Option 1 and 2	No AEoI for the Murrough SPA for any seabird features.

7 Stage 2 Information to inform the In-Combination Assessment

7.1 Approach to tiering

7.1.1.1 The in-combination assessment takes into account the effects associated with the Proposed Development together with other projects and plans. The projects and plans selected as relevant to the in-combination assessment are based upon the results of the ~~Stage 1~~NIS Volume I: Supporting Information for Screening for Appropriate Assessment ~~exercise~~(Revised March 2026) and also the more in-depth Stage 2 appraisal on each of the QIs of the European sites concerned, in the foregoing sections of this NIS.

7.1.1.2 Each project ~~is~~and plan has been considered on a case by case basis for screening ~~into~~in or out of this assessment based upon data confidence, effect-receptor pathways and the spatial/temporal scales involved.

7.1.1.3 ~~In~~When assessing the potential in-combination impacts of the Proposed Development, it is important to ~~note~~recognise that some projects, ~~predominately~~particularly those ~~currently~~labelled as 'proposed'~~, may or may not be, ultimately, taken forward for development~~ or outlined in development plans, may not ultimately materialise or, may not be implemented to the full extent of their assessed design parameters. Therefore, there is a need to ~~build in some consideration~~incorporate a degree of certainty (or uncertainty) ~~with respect to~~regarding the potential impacts which might arise from such proposals. For example, projects which are already under construction are more likely to contribute to in-combination effects (assuming effects or spatial pathways exist) than those development applications that are not yet determined, as some may not attain approval or may not be realised due to various factors.

7.1.1.4 To account for these uncertainties, all the relevant long list of projects considered alongside the Proposed Development have been allocated into 'Tiers', reflecting their current status within the planning and development process. This allows the in-combination assessment to present ~~several~~various future development scenarios, each reflecting the varying levels of certainty of an activity proceeding and therefore the potential for impacts to arise that might act in-combination with the impacts arising from the Proposed Development. It is important to note that for the purposes of the NIS, the level of assessment made for 'future projects' will be greatly influenced by, and reflective of, the level of information available on such projects at the time of compilation of the NIS.

7.1.1.5 A tiered approach to assessment has been adopted as ~~follows:~~described in Table 7.1. The tiering structure reflects descending levels of certainty in terms of project delivery and availability of detailed information, and is consistent with established guidance.

Table 7.1: Tiered approach to the in-combination assessment

Tiers	Development Stage
Tier 1	• The other elements of the project, which are required for the operation of the Proposed Development, including: the Operation and Maintenance (O&M) Facility, Onshore Grid Infrastructure (OGI) and EirGrid Upgrade works; • Phase One Projects, which are on similar development timelines to the Proposed Development; • Projects under construction. Those projects that are only partially constructed at the time that baseline characterisation was undertaken;

Tiers	Development Stage
	• Those that were only recently completed, during the development of the baseline characterisation, the full extent of the impacts arising from the development(s) may not be reflected in the baseline; and/ or • Those plans and projects which may have consent or licences to undertake further work, such as maintenance dredging or notable maintenance works which may arise in additional effects. • Built and operational projects will be included within the in-combination assessment where they have not been included within the environmental characterisation, i.e. they were not operational when the baseline characterisations were undertaken, and/ or any residual impact may not have yet fed through to and been captured in estimates of 'baseline' conditions or there is an ongoing effect.
Tier 2	• Permitted application(s), but not yet implemented;
~~Tier 3~~	~~• Submitted application(s), but not yet determined;~~
Tier 3	• Submitted application(s), but not yet determined; • Identified in the relevant development plan (and emerging development plans – with appropriate weight given as they move closer to adoption) recognising that much information on any relevant proposals will be limited;~~ and~~ • Identified in other plans and programmes (as appropriate) which set the framework for future development consents/ approvals, where such development is reasonably likely to come forward; and • It is expected that ABWP1 will seek consent for the decommissioning of the existing seven WTGs in the near future. Although no public information is available, the decommissioning has been assessed on a precautionary basis i.e. a temporal overlap with the construction of the Proposed Development.
	~~• Identified in other plans and programmes (as appropriate) which set the framework for future development consents/ approvals, where such development is reasonably likely to come forward.~~

~~7.1.1.6 The Developer submitted a Foreshore Licence Application for Site Surveys (associated with the Proposed Development) to the Minister for Housing, Local Government and Heritage in April 2023 (FS007555) and this application is pending determination. The Developer confirms and commits that they will not conduct any activities the subject of the Foreshore Licence Application for Site Surveys (should a licence be granted) at the same time as any development is being carried out under this permission (if granted). As such there is no temporal overlap between the activities proposed in the Foreshore Licence Application and the Proposed Development. For this reason, FS007555 is not included within the in-combination assessment of this NIS.~~

~~7.2 Phase 1 Offshore Wind Projects in Ireland~~

~~7.2.1.1 All Phase 1 projects have been awarded a MAC, due to the likely similar development timelines of the Phase 1 projects, and the resultant risk associated with in-combination effects, there is a requirement to assess Phase 1 projects within the NIS, as appropriate and as information allows. As a result, Phase 1 projects fall outside of the tiered hierarchy described above.~~

~~7.2.1.2 The approach will need to be clearly documented. For a number of topics, Phase 1 projects have been assessed similarly to Tiers 1 and 2 where sufficient information exists, or where information isn't available, a very high-level assessment has been undertaken. For all projects, scoping has been published, and for a number of topics coordinated consultation is ongoing to enable sharing of information for assessments to allow an informed and robust assessment to be undertaken.~~

~~The availability of suitable information will be largely topic driven, with authors aware, and actively involved.~~

~~7.2.1.3 Phase 1 projects comprise:~~

- ~~Dublin Array;~~
- ~~Codling Wind Park I and II;~~
- ~~Oriel Wind Park;~~
- ~~North Irish Sea Array (NISA); and~~
- ~~Fuinneamh Sceirde Teoranta (Sceirde Rocks).~~

7.1.1.6 ~~7.2.1.4~~ Shipping noise is a key characteristic of the ambient underwater noise in the area, and the noise produced by vessels during construction ~~and~~, operational and maintenance and decommissioning phases of the Proposed Development, when considered in-combination with noise associated with existing shipping, shall not increase peak background underwater noise to levels that could disrupt communication due to masking, or alter behaviour patterns, in mobile marine species. The Array Area and Cable Corridor and Working Area are subject to relatively high levels of shipping activity currently, and it is expected that the vessel activity would be no greater than the baseline during construction activities (due to construction exclusion zones reducing current shipping activity and the number of construction vessels expected to be much lower than that which currently transit the area). The underwater noise impacts from vessel noise are generally spatially limited to the immediate area around the vessel rather than having impacts over a wide area (e.g., Mitson, 1993). This is the case for both Project Design Options.

7.1.1.7 ~~7.2.1.5~~ On this basis, plans and/or projects considered have been limited to those with the potential to have in-combination effects with the Proposed Development, namely marine developments or activities in the vicinity of the Array Area and marine developments at a greater distance where disturbance, displacement and collision risks arise in the case of mobile Habitats Directive Annex II species and Birds Directive species. Projects were identified using the same distances used for screening of European sites.

7.1.1.8 ~~7.2.1.6~~ A longlist of reasonably foreseeable plans and projects has been identified and has been reduced to a shortlist for assessment based on whether there is a spatial or temporal overlap between the potential effects of the projects.

7.1.2 Foreshore licence Applications and Temporal Overlap

7.1.2.1 The Developer was granted a Foreshore Licence (FS007339) for site investigations associated with the Proposed Development by the Minister for Housing, Local Government and Heritage in May 2022. The Developer confirms that works undertaken pursuant to this Foreshore Licence will not overlap temporally with works carried out under the planning permission for the Proposed Development (if granted). Accordingly, there is no potential for in-combination effects to arise and FS007339 is not included within the in-combination assessment of this NIS.

7.1.2.2 The Developer was granted a Foreshore Licence for Site Surveys (associated with the Proposed Development) by the Minister for Housing, Local Government and Heritage in April 2023 (FS007555). This application was determined and granted on 04 July 2024 and is valid until 04 June 2029. The Developer confirms and commits that they will not conduct any activities the subject of the Foreshore Licence for Site Surveys at the same time as any development is being carried out under this permission (if granted). As such there is no temporal overlap between the activities proposed in the Foreshore Licence and the Proposed Development. For this reason, FS007555 is not included within the in-combination assessment of this NIS.

7.1.3 Tiered Assessment and Phase One Offshore Wind Projects in Ireland

7.1.3.1 In applying the tiered assessment approach, it is recognised that other offshore wind projects may be at varying stages of development and that differing levels of information may be available. Offshore wind farms designated as Phase One Projects are on similar development timelines to the Proposed Development.

7.1.3.2 All Phase One projects (Codling Wind Park, Dublin Array, North Irish Sea Array (NISA), and Oriel) have been awarded a Maritime Area Consent (MAC) and have formally submitted applications for planning consent. While planning consent has not yet been granted, the potential for overlapping development timelines presents a risk of in-combination effects. Phase One Projects are therefore included within Tier 1 of the in-combination assessments, reflecting their reasonable foreseeability and the potential for temporal and spatial overlap with the Proposed Development.

7.1.3.3 In-combination effects associated with these projects are assessed at a proportionate level, making use of available information and applying precautionary assumptions where necessary. Where more detailed information has been made available through project collaboration or data sharing, this has been used to inform topic-specific in-combination assessments, including for ornithological receptors.

7.1.4 Arklow Bank Wind Park 1

OVERVIEW

7.1.4.1 The owner and operator of the ABWP1, Arklow Energy Limited has commenced pre-application consultation (Case Reference OC27.321635) with the appropriate local authorities to decommission ABWP1, which has reached the end of its operating life.

7.1.4.2 The ABWP1 team has begun engaging with the Maritime Area Regulatory Authority (MARA) and is working closely with An Coimisiún Pleanála to agree on the details of the decommissioning and removal works. Based on the fact that the ABWP1 team has commenced the pre-application process for decommissioning we expect ABWP1 to be fully decommissioned before commencement of operation of ABWP2.

DECOMMISSIONING ASSUMPTIONS FOR ASSESSMENT

7.1.4.3 For the purposes of this NIS, a precautionary approach has been adopted, assuming the potential for temporal overlap between ABWP1 decommissioning and the construction phase of the Proposed Development. This ensures that any reasonably foreseeable in-combination effects on European sites and their associated QIs are considered.

7.1.4.4 Under this assumption, ABWP1 is considered to be undergoing decommissioning concurrently with construction of the Proposed Development. While this may lead to some degree of overlap in potential impacts (for example, disturbance to Annex II marine mammals or habitat alteration), the approach is precautionary and ensures that any potential additive or cumulative pressures on qualifying interests are captured in the assessment.

APPROACH TO IN-COMBINATION ASSESSMENT BY RECEPTOR GROUP

7.1.4.5 The scope of the in-combination assessment for ABWP1 varies by receptor group and reflects the relevant impact pathways identified for each receptor:

- For Annex I Coastal and Marine Habitats and Annex II Migratory Fish, both the operational infrastructure of ABWP1 (including the offshore array and export power cable), i.e. the continued presence of infrastructure, as well as potential future decommissioning activities. This is

precautionary as these receptors may be influenced by the continued presence of seabed infrastructure or sediment disturbance and associated changes to seabed processes from decommissioning;

- For Annex II Marine Mammals and offshore ornithology receptors, the in-combination assessment focuses on the potential temporal overlap between ABWP1 decommissioning activities and the construction phase of the Proposed Development. This reflects the primary impact pathways for these receptors, which relate to temporary construction-decommissioning type pressures such as underwater noise, vessel activity and disturbance, rather than the continued operational presence of infrastructure; and
- In the case of offshore ornithology, the potential contribution of the existing ABWP1 turbines to collision risk has been considered in EIAR Chapter 12: Offshore Ornithology, which concluded that predicted collision levels are very low (fewer than approximately 11 collisions per year across all seven turbines). In addition, the owner and operator of ABWP1 has commenced pre-application consultation with An Coimisiún Pleanála for the decommissioning of ABWP1, which has reached the end of its operational life. On this basis, ABWP1 is expected to be decommissioned prior to operation of the Proposed Development, and therefore operational collision risk from ABWP1 is not considered further within the NIS.

7.2 ~~7.3~~ Other elements of the Proposed Development Included in the In-Combination Assessment

7.2.1 ~~7.3.1~~ Onshore Grid Infrastructure and Operational and Maintenance Facility

7.2.1.1 ~~7.3.1.1~~ In May 2022, ABP granted planning approval to develop the Onshore Grid Infrastructure (OGI) (Case Reference: 310090). The OGI includes a 220 kV substation at Shelton Abbey, with an associated connection from the new substation to the existing National Electricity Transmission Network. The consented development also includes an underground cable route and associated infrastructure connecting the substation to the landfall point at Johnstown North (approximately 5 km north of Arklow harbour), where it will meet the proposed offshore export cables connecting to ABWP2.

7.2.1.2 ~~7.3.1.2~~ In June 2022, the Developer received planning permission from Wicklow County Council (Planning Register Reference: 21/1316) to develop an Operations and Maintenance Facility (OMF) at South Dock, Arklow Harbour. The building and associated pontoon and ancillary infrastructure will serve as the support base for ABWP2 throughout its operational lifetime and will support around ~~60-70~~60 – 70 long term local jobs. This facility will also incorporate a Sustainable Education Centre.

7.2.2 ~~7.3.2~~ EirGrid upgrade works

7.2.2.1 ~~7.3.2.1~~ EirGrid published the Shaping Our Electricity Future (SOEF) Roadmap Version 1.0 in November 2021 and Version 1.1. in July 2023 which is a roadmap for how EirGrid plans to develop the network in line with Ireland's climate change policies which are reflected in the Climate Action Plan (CAP). One of the key targets of the CAP, and a key input to SOEF, is delivery of 5,000MW of Offshore Wind by 2030. EirGrid included all Phase 1 Offshore projects, which includes this development, in their SOEF analysis and confirmed that Arklow-Ballybeg-Carrickmines would need to be up-voltaged to 220kV with a new 220kV/110kV substation at Ballybeg. This project (CP1196) is now in the EirGrid Network Delivery Portfolio (NDP) and is progressing through the EirGrid Project Development Gateways.

7.2.2.2 ~~7.3.2.2~~ The Developer has also received a Grid Connection Assessment (GCA) for an 800 MW offshore project connecting via a loop-in connection just south of Arklow on the Arklow-

Lodgewood 220 kV OHL which passes within 230 m of the proposed loop-in site. The 220 kV double circuit pylons extend south of Arklow 220 kV substation to this location. Currently only one side of the pylons is strung so the other side will need to be strung between Arklow and the proposed substation site. The stringing of the second circuit is defined as non-contestable works required to facilitate the project and will be subject to a separate consent application which will be progressed by EirGrid. A Final Connection Offer will be issued to Developer and executed by EirGrid once the developer achieves full consent for the project and provides proof of route to market.

7.3 ~~7.4~~ Other Projects and Plans Included in the In-combination Assessment

7.3.1.1 ~~7.4.1.1~~ The plans and projects included within the in-combination assessment can be seen in Table 7.2 – Table 7.5 below.

7.3.1.2 ~~7.4.1.2~~ Although plans have been considered, none have been screened in for the in-combination assessment below.

Table 7.2: List of other projects and plans considered within the in-combination assessment for Annex I Coastal and Marine Habitats.

Project/Plan	Status	Distance from Array Area (km)	Distance from Export Cable Corridors and Working Areas (km)	Description of Project/Plan	Dates of Construction	Dates of Operation	Justification for screening in
Tier 1							
Arklow Bank Wind Park 1 Power Cable	Operational	0.0	0.0	~~Power~~Export cable from ABWP1 Array Area to the Irish mainland.	Complete	~~Ongoing~~ 2003/2004 onwards	Temporal overlap of operational phase with the Proposed Development construction and operational and maintenance phases.
~~ABWP2 Onshore Grid Infrastructure (OGI)~~ABWP1 Offshore Array	~~Consented~~ Operational	~~10.2~~0.0	~~0.0~~0.5	~~Onshore grid infrastructure located onshore and required for the operation of the Proposed Development. Includes onshore grid infrastructure including 220kV export cable circuits and fibre optic cables, new 220kV GIS substation at Shelton Abbey and overhead line connection and all associated ancillary works~~ Initial foreshore lease granted in 2002	~~2026 – 2030~~Complete	~~2030 – 2066~~2003/2004 onwards	~~Potential~~ Temporal overlap of operational and maintenance activities with the Proposed Development construction~~,~~ and operational and maintenance phases.
~~ABWP1~~	~~Operational~~	~~0.0~~	~~0.5~~	~~Initial foreshore lease granted in 2002~~	~~Complete~~	~~Ongoing~~	~~Temporal overlap of operational phase with the Proposed Development construction and~~

Project/Plan	Status	Distance from Array Area (km)	Distance from Export Cable Corridors and Working Areas (km)	Description of Project/Plan	Dates of Construction	Dates of Operation	Justification for screening in
							~~Operational and Maintenance phases.~~
Arklow Waste Water Treatment Plant	~~Constructio n~~Operational	3.4	10.8	Relates to ABWP2. The Project (proposed development) will comprise a new Wastewater Treatment Plant (WwTP), associated infrastructure including the interceptor sewer network and marine outfalls as well as an upgrade to the existing coastal revetment. 80% Complete as of 2022.	2021-2024	2025 onwards	Temporal overlap of operational phase with the Proposed Development construction and operational and maintenance phases.
Development to the south of South Quay Arklow - ABWP2 OMF	~~Approved~~Consented	4.3	11.9	Relates to ABWP2. As part of the works, a pontoon is proposed along with up to 4 cranes for loading and unloading of vessels. Additionally, dredging of approximately 6,000 m^3 of material from the nearshore is also proposed, to provide for navigational depth, berthing area and manoeuvring area for vessels.	2026-2030	~~2030~~2034 onwards	Temporal overlap of construction and operational phases with the Proposed Development construction and operational and maintenance phases.
Hibernia Atlantic	Operational	15.4	14.8	Telecom	Complete	Ongoing	Temporal overlap of operational phase with the Proposed Development construction and operational and maintenance phases.

Project/Plan	Status	Distance from Array Area (km)	Distance from Export Cable Corridors and Working Areas (km)	Description of Project/Plan	Dates of Construction	Dates of Operation	Justification for screening in
Irish Mussel Seed Company Ltd.	Operational	9.9	5.3	Aquaculture	Complete	Ongoing	Temporal overlap of operational phase with the Proposed Development construction and operational and maintenance phases.
~~Wicklow Port Company dredge disposal~~Codling Wind Park	~~Operational~~ Application submitted	~~8.8~~10.3	~~7.9~~9.4	~~Dredge disposal~~Application submitted under the Maritime Area Planning (MAP) Act 2021.	~~N/A~~2026 - 2029	~~2024 onwards~~ 2029onwards	Potential for temporal overlap of construction and operation with Proposed Development construction and operational and maintenance phases.
Codling Wind Park ECC	Application submitted	18.9	18.0	Power	2026-2029	2029 onwards	Potential for temporal overlap of construction and operation with Proposed Development construction and operation and maintenance phases.
~~Tier 2~~ Dublin Array	Application submitted	25.8	24.9	Application submitted under the Maritime Area Planning (MAP) Act 2021	2029-2032	2032 onwards	Potential for temporal overlap of construction and operation with Proposed Development construction and operational and maintenance phases.
Dublin Array ECC	Application submitted	31.9	31.0	Power	2029 - 2032	2032 onwards	Potential for temporal overlap of construction and operation with Proposed Development construction and operation and maintenance phases.

Project/Plan	Status	Distance from Array Area (km)	Distance from Export Cable Corridors and Working Areas (km)	Description of Project/Plan	Dates of Construction	Dates of Operation	Justification for screening in
Arklow Flood Relief Scheme	~~Conditionally approved~~Consented	4.01	11.5	Wicklow County Council funded by the Office of Public Works (OPW), proposes to undertake engineering works along the Avoca River and surrounds to mitigate the risk of flooding in the Arklow town area in County Wicklow. Proposed works include dredging, installation of flood defence embankments/ walls and gravel/ debris traps.	2024 - 2028	2028 -	Potential for temporal overlap with Proposed Development construction phase.
Tier 3							
Decommissioning of ABWP1	~~Decommissioning~~Pre-application consultation	0.0	0.5	~~ABWP 1 which is an operational OWF~~Proposed decommissioning ~~phase activities~~ of the seven existing offshore wind turbines at ABWP1. For assessment purposes, a reasonable precautionary scenario is assumed whereby decommissioning activities overlap temporally with construction of the Proposed Development. Indicative decommissioning methods are informed by the ABWP2 Rehabilitation Schedule.	Not defined – assumed to overlap with Proposed Development construction phase for assessment purposes.		Temporal overlap of ~~*operational*~~decommissioning phase with the Proposed Development construction phase.
~~**Phase 1 Projects**~~							
~~Codling Wind Park (formerly~~	~~Early planning~~	~~18.2~~	~~17.3~~	~~Updated application expected to be made under the Maritime~~	~~2027 - 2028~~	~~2028 onwards~~	~~Potential for temporal overlap of construction~~

Project/Plan	Status	Distance from Array Area (km)	Distance from Export Cable Corridors and Working Areas (km)	Description of Project/Plan	Dates of Construction	Dates of Operation	Justification for screening in
~~known as Codling I and Codling II)~~				~~Area Planning Act 2021. Scoping Report indicates up to 140 wind turbines and up to five OSPs (CWP, 2020).~~			~~and operation with Proposed Development construction and Operational and Maintenance phases.~~

Table 7.3: List of other projects and plans considered within the in-combination assessment for Annex II Migratory Fish.

Project/Plan	Status	Distance from Array Area (km)	Distance from **Export Cable Corridors and Working Areas** (km)	Description of Project/Plan	Dates of Construction	Dates of Operation	Justification for screening in
Tier 1							
Arklow Phase 1 Power Cable	Operational	0	0	Export cable from ABWP1 Array Area to the Irish mainland	Complete	2003/2004 - onwards	Potential for temporal overlap of operation with Proposed Development construction and operational and maintenance phases.
ABWP1 Offshore Array	Operational	0	0.5	Initial foreshore ~~lease~~licence granted in 2002"	Complete	~~2021~~2003/04 onwards	Temporal overlap of operational phase with the Proposed Development construction and operational and maintenance phases.
Wicklow County Council dredging	Operational	9.7	8.9	Bed-level dredging and mechanical dredging		2024 - 2027	Potential for temporal overlap with Proposed Development construction phases.
Codling Wind Park	Application submitted	10.3	9.4	Application submitted under the Maritime Area Planning	2026 - 2029	2029 onwards	Potential for temporal overlap of construction and operation with Proposed

Project/Plan	Status	Distance from Array Area (km)	Distance from **Export Cable Corridors and Working Areas** (km)	Description of Project/Plan	Dates of Construction	Dates of Operation	Justification for screening in
				(MAP) Act 2021.			Development construction and operational and maintenance phases.
Hibernia Atlantic Telecom	Operational	15.4	14.8	Telecom	Complete	2021 onwards	Potential for temporal overlap of operation with Proposed Development construction and operational and maintenance phases.
Codling Wind Park ECC	Application submitted	18.9	18.0	Power	2026-2029	2029 onwards	Potential for temporal overlap of construction and operation with Proposed Development construction and operational and maintenance phases.
Dublin Array	Application submitted	25.8	24.9	Application submitted under the Maritime Area Planning (MAP) Act 2021.	2029-2032	2032 onwards	Potential for temporal overlap of construction and operation with Proposed Development construction and operational and

Project/Plan	Status	Distance from Array Area (km)	Distance from **Export Cable Corridors and Working Areas** (km)	Description of Project/Plan	Dates of Construction	Dates of Operation	Justification for screening in
							maintenance phases.
Dublin Array ECC	*Application submitted*	31.9	*31*	Power	*2029-2032*	2032 onwards	Potential for temporal overlap of construction and operation with Proposed Development construction and operational and maintenance phases.
UK-Ireland 2 Telecom	Operational	39.0	38.4	Telecom	Complete	2021 onwards	Potential for temporal overlap of operation with Proposed Development construction and operational and maintenance phases.
~~ESAT 2~~Dublin Port Company dredge disposal	Operational	~~46.3~~45.1	~~45.4~~44.2	~~Telecom~~Disposal of dredged material	~~2021~~	~~2021 onwards~~2022 - 2034	Potential for temporal overlap ~~of operation~~ with Proposed Development construction and operational and maintenance phases.

Project/Plan	Status	Distance from Array Area (km)	Distance from **Export Cable Corridors and Working Areas** (km)	Description of Project/Plan	Dates of Construction	Dates of Operation	Justification for screening in
Dublin Port Company dredge disposal	Operational	45.2	44.3	Disposal of dredged material		2022 - 2029	Potential for temporal overlap with Proposed Development construction phase.
~~CeltixConnect - Sea Fibre Networks~~ESAT 2	Operational	~~49.2~~46.3	~~48.3~~45.4	Telecom~~ cable~~	~~2022 - 2026~~2021	~~2026~~2021 onwards	Potential for temporal overlap of operation with Proposed Development construction and operational and maintenance phases.
~~Arklow Bank dredge disposal~~ CeltixConnect - Sea Fibre Networks	Operational	~~0.0~~49.2	~~0.8~~48.3	~~Dredge disposal~~ Telecom cable	~~N/A~~Complete	~~2021~~2026 onwards	Potential for temporal overlap of operation with Proposed Development construction and operational and maintenance phases.
Hibernia Atlantic – Hibernia C	Operational	54.8	53.9	Telecom	Complete	2021 onwards	Potential for temporal overlap of operation with Proposed Development construction and operational and maintenance phases.

Project/Plan	Status	Distance from Array Area (km)	Distance from **Export Cable Corridors and Working Areas** (km)	Description of Project/Plan	Dates of Construction	Dates of Operation	Justification for screening in
ZAYO Emerald Bridge One - Telecom	Operational	58.5	57.6	Telecom	Complete	2021 onwards	Potential for temporal overlap of operation with Proposed Development construction and operational and maintenance phases.
SIRIUS South - Telecom	Operational	58.7	57.8	Telecom	Complete	2021 onwards	Potential for temporal overlap of operation with Proposed Development construction and operational and maintenance phases.
~~Wicklow Port Company dredge disposal~~Rockabill	Operational	~~8.8~~64.9	~~7.9~~64.0	~~Dredge disposal~~Telecom	~~N/A~~Complete	~~2024~~2021 onwards	Potential for temporal overlap of operation with Proposed Development construction and operational and maintenance phases.
~~**Tier 3**~~							
~~Mares Connect~~North	~~Proposed~~Planning	~~37.5~~65.1	~~36.6~~64.1	~~Power cable~~Application submitted	~~2024 –~~2027 - 2030	~~2027~~2030	Potential for temporal overlap of construction and

Project/Plan	Status	Distance from Array Area (km)	Distance from **Export Cable Corridors and Working Areas** (km)	Description of Project/Plan	Dates of Construction	Dates of Operation	Justification for screening in
Irish Sea Array (NISA)	application submitted			under the Maritime Area Planning Act 2021. Updated application expected to be made under the MAP Act 2021.		onwards	operation with Proposed Development construction and operational and maintenance phases.
~~ABWP1~~UK-Ireland crossing 1	~~Decommissioning~~Operational	~~0.0~~67.0	~~0.5~~66.4	~~ABWP 1 which is an operational OWF decommissioning phase activities~~ Telecom	Complete	2021 onwards	Potential for temporal overlap of ~~operational phase~~operation with ~~the~~ Proposed Development construction ~~phase~~and operational and maintenance phases.
~~**Phase 1 Projects**~~East West Interconnector	Operational	68.5	67.6	Power	Complete	2021 onwards	Potential for temporal overlap of operation with Proposed Development construction and operational and maintenance phases.
~~Codling Wind Park (formerly known as~~	~~Early planning~~	~~18.2~~69.0	~~17.3~~68.4	~~Updated application expected to~~	~~2027 – 2028~~Complete	~~2028~~2021 onwards	Potential for temporal overlap of ~~construction and~~ operation with

Project/Plan	Status	Distance from Array Area (km)	Distance from **Export Cable Corridors and Working Areas** (km)	Description of Project/Plan	Dates of Construction	Dates of Operation	Justification for screening in
~~Codling I and Codling II)~~SOLAS	Operational			~~be made under the Maritime Area Planning Act 2021. Scoping Report indicates up to 140 wind turbines and up to five OSPs (CWP, 2020).~~Telecom			Proposed Development construction and operational and maintenance phases.
~~Dublin Array (formerly known as Bray and Kish Offshore Windfarms)~~Havhingsten	~~Proposed~~Operational	~~25.8~~70.3	~~24.9~~69.3	~~Updated application expected to be made under the Maritime Area Planning Act 2021. Scoping Report indicates up to 61 wind turbines with up to 308 m tip height and indicative hub~~	~~2028-2032~~2021	~~2032~~2021 onwards	Potential for temporal overlap of ~~construction and~~ operation with Proposed Development construction and operational and maintenance phases.

Project/Plan	Status	Distance from Array Area (km)	Distance from **Export Cable Corridors and Working Areas** (km)	Description of Project/Plan	Dates of Construction	Dates of Operation	Justification for screening in
				~~height of 165.5 m above mean high water springs (Innogy, 2020).~~Telecom			
Wexford County council dredge disposal	Operational	75.9	75.3	Disposal of dredged material	N/A	2021-2027	Potential for temporal overlap with Proposed Development construction phase.
Greenlink Interconnector	Operational	79.6	79.0	Power	2024-2026	2026 onwards	Potential for temporal overlap of operation with Proposed Development construction and operation and maintenance phases.
NISA ECC	*Application submitted*	*80.0*	*79.1*	*Power*	*2027-2030*	*2030 onwards*	Potential for temporal overlap of operation with Proposed Development construction and operational and maintenance phases.

Project/Plan	Status	Distance from Array Area (km)	Distance from **Export Cable Corridors and Working Areas** (km)	Description of Project/Plan	Dates of Construction	Dates of Operation	Justification for screening in
Tier 3							
Decommissioning of ABWP1	Pre-application consultation	0	0	Proposed decommissioning of the seven existing offshore wind turbines at ABWP1. For assessment purposes, a reasonable precautionary scenario is assumed whereby decommissioning activities overlap temporally with construction of the Proposed Development. Indicative decommissioning methods are informed by the ABWP2 Rehabilitation Schedule.	Not defined – assumed to overlap with Proposed Development construction phase for assessment purposes.		Potential for temporal overlap of decommissioning with Proposed Development construction phase.
~~North Irish Sea Array~~Mares Connect	~~Early planning~~ Proposed	~~65.1~~37.5	~~64.1~~36.6	~~Site investigation~~	~~2027~~2026 - ~~2029~~2028	~~2029~~2028 onwards	Potential for temporal overlap of construction and operation with Proposed

Project/Plan	Status	Distance from Array Area (km)	Distance from **Export Cable Corridors and Working Areas** (km)	Description of Project/Plan	Dates of Construction	Dates of Operation	Justification for screening in
				~~works from 2021-2026~~ ~~Foreshore licence applied for surveys from summer 2020. Planning submission targeted 2023.~~Power cable			Development construction and operational and maintenance phases.
Rosslare Euro Port (Rosslare Offshore Renewable Hub)	Planning application submitted	52.2	51.6	Proposed development of Rosslare Offshore Renewable Energy (ORE) Hub for offshore wind energy.	2027 – 2028	From 2029	Potential for temporal overlap with Proposed Development construction phase.

Table 7.4: List of other projects and plans considered within the in-combination assessment for Annex II Marine Mammals.

Project/ Plan	Status	Distance from Array Area (km)	Distance from Export Cable Corridors and Working Areas (km)	Description of Project/Plan	Dates of Construction	Dates of Operation	Justification for screening in
Tier 1							
~~Saint-Brieuc~~Codling Wind Park	~~Under construction~~ Application submitted	~~480.6~~10.3	~~479.9~~9.4	~~A 496 MW offshore windfarm with 62 turbines~~'Relevant Project'. Application made under the Maritime Area Planning (MAP) Act 2021.	~~2021~~2026 - ~~2024~~ 2029	~~From 2025~~2029 onwards	~~Within the ZoI for~~ Potential ~~in-combination impacts~~for temporal overlap with Proposed Development construction and operational and maintenance phases.
~~CeltixConnect~~Dublin Array	~~Active~~Application submitted	~~49.2~~25.8	~~48.3~~24.9	~~Telecom cable~~'Relevant Project'. Application made under the MAP Act 2021.	~~2022 – 2026~~ 2029 - 2032	~~From 2027~~ 2032 onwards	Potential for temporal overlap with Proposed Development construction ~~phase~~and operational and maintenance phases.
NISA	Application submitted	65.1	64.1	'Relevant Project'. Application made under the MAP Act 2021.	2027 - 2030	2030 onwards	Potential for temporal overlap with Proposed Development construction and operational and maintenance phases.
Oriel	Planning application submitted	108.1	107.2	Application submitted under the Maritime Area Planning Act 2021.	2028 - 2030	2030 onwards	Potential for temporal overlap with Proposed Development construction and operational and maintenance phase.
Greenlink Interconnector	~~In~~Under construction	79.6	79.0	Power cable.	~~2021 –~~ 2024 – 2026	From ~~2025~~2027	~~Within the ZoI for~~ Potential in-combination ~~impacts~~effects exist.

Project/ Plan	Status	Distance from Array Area (km)	Distance from Export Cable Corridors and Working Areas (km)	Description of Project/Plan	Dates of Construction	Dates of Operation	Justification for screening in
Erebus Floating Wind Demo	Consented	133.3	132.7	Consented for up to 7 turbines.	2023 - 2026	From 2027	Potential in-combination effects exist.
~~Celtic Interconnector~~Awel y Môr	~~In construction~~ Consented	~~151.9~~148.5	~~151.3~~147.6	~~Power cable~~Consented for up to 50 turbines.	~~2023~~2025 – ~~2026~~ 2027	From ~~2027~~2028	Potential for temporal overlap with Proposed Development construction phase.
~~West Anglesey demonstration zone~~Morgan	~~Under construction~~ Consented	~~85.0~~165.3	~~84.1~~164.3	~~Tidal~~English Round 4 project with up to 96 turbines.	~~2023~~2028 – ~~2026~~ 2028	From ~~2027~~2029	Potential for temporal overlap with Proposed Development construction phase.
~~Tier 2~~North Hoyle	Decommissioning	170.9	170.1	Decommissioning of 60 MW offshore wind farm comprising of 30 turbines.	2031 - 2034	Pre 2021 - 2030	Potential in-combination effects exist.
~~Erebus Floating Wind Demo~~White Cross	Consented	~~133.3~~174.7	~~132.7~~174.0	~~Consented for~~A 100 MW floating offshore wind demonstration project with up to ~~7~~8 turbines.	~~2025/~~2026 – ~~2026/~~2027	From 2028	Potential for temporal overlap with Proposed Development construction phase.
Burbo Bank	Operational	189.9	189.0	Decommissioning of original 90 MW site comprising of 25 turbines.	2031 - 2034	Pre 2021 - 2030	Potential in-combination effects exist.

Project/ Plan	Status	Distance from Array Area (km)	Distance from Export Cable Corridors and Working Areas (km)	Description of Project/Plan	Dates of Construction	Dates of Operation	Justification for screening in
Walney 1	Operational	199.1	198.1	Decommissioning of 184 MW offshore wind farm comprising of 51 monopiles.	2031 - 2034	Pre 2021 - 2030	Potential in-combination effects exist.
TwinHub	Operational	256.2	255.6	Floating wind demonstration site with up to 4 turbines.	2024 - 2026	From 2027	Potential in-combination effects exist.
Tier 2							
~~Awel y Môr~~Holyhead Deep	Consented	~~148.5~~84.0	~~147.6~~83.1	~~Consented for up to 50 turbines~~Tidal.	2026 – ~~2030~~2027	From ~~2031~~2028	Potential for temporal overlap with Proposed Development construction phase.
~~Atlantic Marine Energy Test Site~~West Anglesey demonstration zone	Consented	~~314.3~~85.0	~~308.8~~84.1	~~Test site for wave energy converters and floating wind~~Tidal.	~~2024~~2022 – ~~2025~~2026	From ~~2026~~2027	~~Within the ZoI for~~ Potential in-combination ~~impacts~~effects exist.
~~Holyhead Deep~~Mona	Consented	~~84.0~~146.7	~~83.1~~145.7	~~Tidal~~English Round 4 project with up to 107 turbines. Lease awarded.	~~2026~~2025 – ~~2029~~ 2028	From ~~2030~~ 2029	Potential for temporal overlap with Proposed Development construction phase.
Celtic Interconnector	Under construction	151.9	151.3	Power cable.	2024 – 2027	From 2028	Potential for temporal overlap with Proposed Development construction phase.

Project/ Plan	Status	Distance from Array Area (km)	Distance from Export Cable Corridors and Working Areas (km)	Description of Project/Plan	Dates of Construction	Dates of Operation	Justification for screening in
Tier 3							
~~Valorous~~Decommissioning of ABWP1	~~Pre-planning application~~Pre-application consultation	~~141.9~~0.0	~~141.3~~0.0	~~Pre-lease offshore windfarm (Project planning and design phase)~~Proposed decommissioning of the seven existing offshore wind turbines at ABWP1. For assessment purposes, a reasonable precautionary scenario is assumed whereby decommissioning activities overlap temporally with construction of the Proposed Development. Indicative decommissioning methods are informed by the ABWP2 Rehabilitation Schedule.	~~2029~~ Not defined – assumed to overlap with Proposed Development construction phase for assessment purposes ~~From 2030~~		Potential for temporal overlap with Proposed Development construction phase.
~~Mona~~Mares Connect	~~Planning application submitted~~Proposed	~~146.7~~37.5	~~145.7~~36.6	~~English Round 4 project with up to 107 turbines. Lease awarded~~Power cable.	2026 – ~~2027~~2028	From ~~2028~~2029	Potential for temporal overlap with Proposed Development construction phase.
Rosslare Euro Port	Planning application submitted	52.2	51.6	Proposed development of Rosslare Offshore Renewable Energy (ORE) Hub for offshore wind energy.	2027 – 2028	From 2029	Potential for temporal overlap with Proposed Development construction phase.

Project/ Plan	Status	Distance from Array Area (km)	Distance from Export Cable Corridors and Working Areas (km)	Description of Project/Plan	Dates of Construction	Dates of Operation	Justification for screening in
~~Llyr 1~~Port of Waterford ORE Capable Terminal (Belview)	~~Pre-planning~~Planning application submitted	~~148.0~~88.8	~~147.3~~88.2	~~A 200 MW test and demonstration site for floating~~Proposed development of Port of Waterford ORE for offshore wind ~~with up to 10 turbines~~energy.	~~2026 –~~2027 – 2028	From ~~2028~~2029	Potential for temporal overlap with Proposed Development construction phase.
Erebus / Valorous proposed cable route	Proposed	123.7	123.0	Power cable.	2025 – 2026	From 2027	Potential for temporal overlap with Proposed Development construction phase.
Pembrokeshire Demonstration Zone	Pre-planning application	144.3	143.7	Wave.	2025 - 2026	From 2027	Potential in-combination effects exist.
Llyr ~~2~~1	~~Pre-planning~~Planning application submitted	~~151.9~~148.0	~~151.2~~147.3	A 200 MW test and demonstration site for floating offshore wind with up to 10 turbines.	~~2026 –~~2027 – 2029	From ~~2028~~2030	Potential for temporal overlap with Proposed Development construction phase.
~~Morgan~~Llyr 2	Pre-planning application	~~165.3~~151.9	~~164.3~~151.2	~~English Round 4 project~~A 200 MW test and demonstration site for floating offshore wind with up to ~~96~~10 turbines.	~~2028~~2027 – 2029	From 2030	Potential for temporal overlap with Proposed Development construction phase.

Project/ Plan	Status	Distance from Array Area (km)	Distance from Export Cable Corridors and Working Areas (km)	Description of Project/Plan	Dates of Construction	Dates of Operation	Justification for screening in
Morecambe	Pre-planning application	174.2	173.3	English Round 4 project with up to 40 turbines.	~~2026/~~2027 - ~~2028/2029~~2030	From ~~2030~~2031	Potential for temporal overlap with Proposed Development construction phase.
~~White Cross~~	~~Planning application submitted~~	~~174.7~~	~~174.0~~	~~A 100 MW floating offshore wind demonstration project with up to 8 turbines.~~	~~2026 – 2027~~	~~From 2028~~	~~Potential for temporal overlap with Proposed Development construction phase.~~
Isle of Man (Mooir Vannin)	~~Pre-planning~~Planning application submitted	179.2	178.2	A 1.4 GW offshore windfarm with up to 100 turbines.	~~2030~~2028 - ~~unknown~~2031	~~unknown~~From 2032	Potential for temporal overlap with Proposed Development construction phase.
North Channel Wind 2	Pre-planning application	204.0	203.1	A 420 MW offshore windfarm in Northern Ireland.	~~2029~~2028 – ~~2030~~2031	From ~~2031~~2032	Potential for temporal overlap with Proposed Development construction phase.
~~North Channel Wind 1~~	~~Pre-planning application~~	~~227.9~~	~~227.0~~	~~A 1 GW offshore windfarm in Northern Ireland.~~	~~2029 – 2030~~	~~From 2031~~	~~Potential for temporal overlap with Proposed Development construction phase.~~
~~Mares Connect~~	~~Proposed~~	~~37.5~~	~~36.6~~	~~Power cable.~~	~~2024 – 2027~~	~~From 2028~~	~~Potential for temporal overlap with Proposed Development construction phase.~~

Project/ Plan	Status	Distance from Array Area (km)	Distance from Export Cable Corridors and Working Areas (km)	Description of Project/Plan	Dates of Construction	Dates of Operation	Justification for screening in
~~Xlinks~~LirIC	Proposed	~~192.3~~204.6	~~191.6~~203.7	Power cable.	~~2027~~2028 - 2029	From 2030	Potential for temporal overlap with Proposed Development construction phase.
~~Erebus / Valorous proposed cable route~~North Channel Wind 1	~~Proposed~~Pre-planning application	~~123.7~~227.9	~~123.0~~227.0	~~Power cable~~A 1 GW offshore windfarm in Northern Ireland.	~~2025~~2028 – ~~2026~~ 2031	From ~~2027~~2032	Potential for temporal overlap with Proposed Development construction phase.
~~LirIC~~	~~Proposed~~	~~204.6~~	~~203.7~~	~~Power cable.~~	~~Unknown – 2028~~	~~From 2029~~	~~Potential for temporal overlap with Proposed Development construction phase.~~

Table 7.5: List of other projects and plans considered within the in-combination assessment for waders and offshore ornithology.

~~ABWP1~~Project/ Plan	~~Decommissioning~~Status	~~0.0~~	~~0.5~~Distance from Array Area (km)	~~ABWP 1 which is an operational OWF decommissioning phase activities~~ Distance from **Export Cable Corridors and Working Areas** (km)	Description of Project/Plan	Dates of Construction (if applicable)	**Dates of Operation (if applicable)**	~~Temporal of operational phase~~ ~~construction phase.~~
~~Phase~~Tier 1 ~~Projects~~								
Codling Wind Park ~~(formerly known as Codling I and Codling II)~~	~~Early planning~~ Application submitted	~~18.2~~	~~17.3~~10.3	~~Updated application expected to be made under the Maritime Area Planning Act 2021. Scopin~~	'Relevant Project'. Application made under the MAP Act 2021.	~~2027~~2026 - ~~2028~~2029	~~2028~~2029 onwards	Potential for ~~temporal~~ overlap ~~of construction and operation~~ with Proposed Development construction and operational and maintenance phases.

~~ABWP1~~Project/ Plan	~~Decommissioning~~Status	~~**0.0**~~	~~0.5~~Distance from Array Area (km)	~~ABWP 1 which is an operational OWF decommissioning phase activities~~ Distance from **Export Cable Corridors and Working Areas** (km)	Description of Project/Plan	Dates of Construction (if applicable)	**Dates of Operation (if applicable)**	~~Temporal of operational phase~~ ~~construction phase.~~
				~~g Report indicates up to 140 wind turbines and up to five OSPs (CWP, 2020).~~9.5				
Dublin Array ~~(formerly known as Bray and Kish~~	~~Proposed~~Application submitted	~~25.8~~	~~24.9~~25.8	~~Updated application expecte~~	'Relevant Project'. Application made under the MAP Act 2021	~~2028 - 2032~~2029 - 2032	2032 onwards	Potential for ~~temporal~~ overlap ~~of construction and operation~~ with Proposed Development

~~ABWP1~~Project/ Plan	~~Decommissioning~~Status	~~**0.0**~~	~~0.5~~Distance from Array Area (km)	~~ABWP 1 which is an operational OWF decommissioning phase activities~~ Distance from **Export Cable Corridors and Working Areas** (km)	Description of Project/Plan	Dates of Construction (if applicable)	**Dates of Operation (if applicable)**	~~Temporal of operational phase~~ ~~construction phase.~~
~~Offshore Windfarms)~~				~~d to be made under the Maritime Area Planning Act 2021. Scoping Report indicates up to 61 wind turbines with up to 308 m tip~~				construction and operational and maintenance phases.

~~ABWP1~~Project/ Plan	~~Decommissioning~~Status	~~**0.0**~~	~~0.5~~Distance from Array Area (km)	~~ABWP 1 which is an operational OWF decommissioning phase activities~~ Distance from **Export Cable Corridors and Working Areas** (km)	Description of Project/Plan	Dates of Construction (if applicable)	**Dates of Operation (if applicable)**	~~Temporal of operational phase~~ ~~construction phase.~~
				~~height and indicative hub height of 165.5 m above mean high water springs (Innogy, 2020).~~2 4.9				

~~ABWP1~~Project/ Plan	~~Decommissioning~~Status	~~**0.0**~~	~~0.5~~Distance from Array Area (km)	~~ABWP 1 which is an operational OWF decommissioning phase activities~~ Distance from **Export Cable Corridors and Working Areas** (km)	Description of Project/Plan	Dates of Construction (if applicable)	**Dates of Operation (if applicable)**	~~Temporal of operational phase~~ ~~construction phase.~~
~~North Irish Sea Array~~NISA	~~Early planning~~Application submitted	~~65.1~~	~~64.1~~65.1	~~Site investigation works from 2021 - 2026~~ ~~Foreshore licence applied for surveys from summer 2020. Plannin~~	'Relevant Project'. Application made under the MAP Act 2021.	2027 - ~~2029~~2030	~~2029~~2030 onwards	Potential for ~~temporal~~ overlap ~~of construction and operation~~ with Proposed Development construction and operational and maintenance phases.

~~ABWP1~~Project/ Plan	~~Decommissioning~~Status	~~**0.0**~~	~~0.5~~Distance from Array Area (km)	~~ABWP 1 which is an operational OWF decommissioning phase activities~~ Distance from **Export Cable Corridors and Working Areas** (km)	Description of Project/Plan	Dates of Construction (if applicable)	**Dates of Operation (if applicable)**	~~Temporal of operational phase~~ ~~construction phase.~~
				~~g submission targeted 2023.~~64.1				
Oriel Wind Park	~~Proposed~~Application submitted	~~108.1~~	~~107.2~~108.1	~~'Relevant Project'. Updated application expected to be made~~	'Relevant Project' Application made under the MAP Act 2021.	~~2026-2028 (piling from 2026 – 2027)~~2028 - 2030	~~From~~ 2030 onwards	Potential for ~~temporal~~ overlap with Proposed Development construction ~~phase~~an operational and maintenance phases.

~~ABWP1~~Project/ Plan	~~Decommissioning~~Status	~~**0.0**~~	~~0.5~~Distance from Array Area (km)	~~ABWP 1 which is an operational OWF decommissioning phase activities~~ Distance from **Export Cable Corridors and Working Areas** (km)	Description of Project/Plan	Dates of Construction (if applicable)	**Dates of Operation (if applicable)**	~~Temporal of operational phase~~ ~~construction phase.~~
				~~under the Maritime Area Planning Act 2021. 'Relevant Project'. Phase 1~~ ~~Concept/ Early Planning (MAC~~				

~~ABWP1~~Project/ Plan	~~Decommissioning~~Status	~~**0.0**~~	~~0.5~~Distance from Array Area (km)	~~ABWP 1 which is an operational OWF decommissioning phase activities~~ Distance from **Export Cable Corridors and Working Areas** (km)	Description of Project/Plan	Dates of Construction (if applicable)	**Dates of Operation (if applicable)**	~~Temporal of operational phase~~ ~~construction phase.~~
				~~awarded~~ ~~)~~ ~~Foreshore licence application determined 2023.~~10 7.2				
~~Sceirde Rocks~~	~~Proposed~~		~~264.3~~	~~254.1~~	~~'Relevant Project'. Updated application expected to be made under the~~	~~2026 – 2030~~	~~From 2031~~	~~Potential for temporal overlap with Proposed Development construction phase.~~

~~ABWP1~~Project/ Plan	~~Decommissioning~~Status	~~**0.0**~~	~~0.5~~Distance from Array Area (km)	~~ABWP 1 which is an operational OWF decommissioning phase activities~~ Distance from **Export Cable Corridors and Working Areas** (km)	Description of Project/Plan	Dates of Construction (if applicable)	**Dates of Operation (if applicable)**	~~Temporal of operational phase~~ ~~construction phase.~~
					~~Maritime Area Planning Act 2021.A 450 MW Irish offshore windfarm. MAC awarded in 2022~~			

Table 7.5: List of other projects and plans considered within the in-combination assessment for waders and offshore ornithology

Project/Plan	Status	Distance from Array Area (km)	Distance from offshore export cable routes (km)	Description of Project/Plan	Dates of Construction (if applicable)	Dates of Operation (if applicable)	Overlap with the Proposed Development
Tier 1							
ABWP1	Operational	0	0.5	ABWP1, consisting of seven wind turbines at a capacity of 25.2 MW.	2003 to 2004	2004 to ongoing	Screened in due to ongoing impact. Located within the Array Area.
Rhyl Flats	Operational	156.3	155.5	Operational windfarm comprising 25 turbines	N/A	2009 – ongoing	Screened in due to ongoing impact. Located within Irish Sea with potential to contribute to impacts on regional seabird populations
Barrow Offshore Windfarm	Operational	208.6	207.6	Operational windfarm comprising 30 turbines	N/A	2006 to ongoing	Screened in due to ongoing impact. Located within Irish Sea with potential to contribute to impacts on regional seabird populations
Gwynt y Mor Offshore Windfarm	Operational	159	158.1	Operational windfarm comprising 160 turbines	N/A	2015 – ongoing	Screened in due to ongoing impact. Located within Irish Sea with potential to contribute to impacts

~~Project/Plan~~	~~Status~~	~~Distance from Array Area (km)~~	~~Distance from offshore export cable routes (km)~~	~~Description of Project/Plan~~	~~Dates of Construction (if applicable)~~	~~Dates of Operation (if applicable)~~	~~Overlap with the Proposed Development~~
							on regional seabird populations
North Hoyle	Operational	170.9	170.1	Operational windfarm comprising 30 turbines	N/A	2003 – ongoing	Screened in due to ongoing impact. Located within Irish Sea with potential to contribute to impacts on regional seabird populations
Walney Extension	Operational	187.1	186.1	Operational windfarm comprising 47 turbines	N/A	2018 – ongoing	Screened in due to ongoing impact. Located within Irish Sea with potential to contribute to impacts on regional seabird populations
Burbo Bank	Operational	189.9	189.0	Operational windfarm comprising 25 turbines	N/A	2007 – ongoing	Screened in due to ongoing impact. Located within Irish Sea with potential to contribute to impacts on regional seabird populations
Burbo Bank Extension	Operational	180.6	179.8	Operational windfarm comprising 32 turbines	N/A	2017- ongoing	Screened in due to ongoing impact. Located within Irish Sea with potential to contribute to impacts

~~Project/Plan~~	~~Status~~	~~Distance from Array Area (km)~~	~~Distance from offshore export cable routes (km)~~	~~Description of Project/Plan~~	~~Dates of Construction (if applicable)~~	~~Dates of Operation (if applicable)~~	~~Overlap with the Proposed Development~~
							on regional seabird populations
Robin Rigg Offshore Windfarm	Operational	247.3	246.3	Operational windfarm comprising 58 turbines	N/A	2010 – ongoing	Screened in due to ongoing impact. Located within Irish Sea with potential to contribute to impacts on regional seabird populations
West of Duddon Sands Offshore Windfarm	Operational	196.9	195.9	Operational windfarm comprising 108 turbines	N/A	2014 – ongoing	Screened in due to ongoing impact. Located within Irish Sea with potential to contribute to impacts on regional seabird populations
Walney Offshore Windfarm	Operational	199.1	198.1	Operational windfarm comprising 102 turbines	N/A	2010 – ongoing	Screened in due to ongoing impact. Located within Irish Sea with potential to contribute to impacts on regional seabird populations
~~Ormonde~~	~~Operational~~	~~207.4~~	~~206.4~~	~~Operational windfarm comprising 30 turbines~~	~~N/A~~	~~2012 – ongoing~~	~~Screened in due to ongoing impact. Located within Irish Sea with potential to contribute to impacts~~

Project/Plan	Status	Distance from Array Area (km)	Distance from offshore export cable routes (km)	Description of Project/Plan	Dates of Construction (if applicable)	Dates of Operation (if applicable)	Overlap with the Proposed Development
							on regional seabird populations
Tier 2							
Erebus Offshore Windfarm	Consented	133.3	132.7	Consented for up to 7 turbines	2025-2027	From 2028	Potential for overlap with Proposed Development construction and operational and maintenance phases
Awel y Mor Offshore Windfarm	Consented	148.5	147.6	Consented for up to 50 turbines	2026-2030	From 2031	Potential for overlap with Proposed Development construction and operational and maintenance phases
Twin HubMorgan Offshore Windfarm	Consented	256.21 65.3	255.616 4.3	Floating test site withEnglish Round 4 project with up to 96 turbines	20262028-2029	2027From 2030	Potential for overlap with Proposed Development construction and operational and maintenance phases.
Tier 3							
ABWP1	Decommissioning	0	0.5	ABWP1, consisting of seven wind turbines at a	2026	N/A	Screened in due to potential for overlap between

~~Project/Plan~~	~~Status~~	~~Distance from Array Area (km)~~	~~Distance from offshore export cable routes (km)~~	~~Description of Project/Plan~~	~~Dates of Construction (if applicable)~~	~~Dates of Operation (if applicable)~~	~~Overlap with the Proposed Development~~
				~~capacity of 25.2 MW.~~			~~decommissioning of ABWP1 and construction of ABWP2.~~
~~Mona~~Morecambe Offshore Windfarm	~~Proposed~~Consented	~~146.71~~74.2	~~145.717~~3.3	English Round 4 project with up to ~~1074~~0 turbines	~~2026-2027~~2026-2029	From ~~2028~~2030	Potential for overlap with Proposed Development construction and operational and maintenance phases
~~Morgan~~Twin Hub Offshore Windfarm	~~Proposed~~Consented	~~165.32~~56.2	~~164.325~~5.6	~~English Round~~Floating test site with 4 ~~project with up to 96~~ turbines	~~2028-2029~~2026	~~From 2030~~2027	Potential for overlap with Proposed Development construction and operational and maintenance phases.
~~Morecambe Offshore Windfarm~~White Cross	~~Proposed~~Consented	~~174.21~~74.7	~~173.317~~4.0	~~English Round 4 project~~Floating turbine demonstration site with up to ~~40~~8 turbines	~~2026-2029~~2028	~~From 2030~~2029	Potential for overlap with Proposed Development construction and operational and maintenance phases
~~Valorous Offshore Windfarm~~Ormonde	~~Proposed~~Operational	~~141.92~~07.4	~~141.320~~6.4	~~Early stage planning~~Operational windfarm comprising 30 turbines	~~2029~~N/A	~~From 2030~~2012 – ongoing	Screened in due to ongoing impact. Located within Irish Sea with potential ~~overlap of Operational and~~

~~Project/Plan~~	~~Status~~	~~Distance from Array Area (km)~~	~~Distance from offshore export cable routes (km)~~	~~Description of Project/Plan~~	~~Dates of Construction (if applicable)~~	~~Dates of Operation (if applicable)~~	~~Overlap with the Proposed Development~~
							~~Maintenance phases.~~to contribute to impacts on regional seabird populations
~~Phase 1 Projects~~**Tier 2**							
~~Codling Wind Park (formerly known as Codling I and Codling II)~~Mona Offshore Windfarm	~~Proposed~~Consented	~~18.2~~14 6.7	~~17.3~~145. 7	~~'Relevant Project'. Updated application expected to be made under the Marine Planning and Development Management (MPDM) regime. Scoping Report indicates up to 140 wind turbines and up to five OSPs (CWP, 2020).~~English Round 4 project with up to 107 turbines	~~2026-2028~~2026-2027	From ~~2029~~2028	Potential for overlap with Proposed Development construction and operational and maintenance phases~~.~~
Tier 3							
Decommissioning of ABWP1	Pre-application consultation	0	0	Proposed decommissioning of the seven existing offshore wind turbines at Arklow	Not defined – assumed to overlap with Proposed Development construction		Screened in due to potential for overlap between decommissioning of ABWP1 and

~~Project/Plan~~	~~Status~~	~~Distance from Array Area (km)~~	~~Distance from offshore export cable routes (km)~~	~~Description of Project/Plan~~	~~Dates of Construction (if applicable)~~	~~Dates of Operation (if applicable)~~	~~Overlap with the Proposed Development~~
				Bank Wind Park 1 (ABWP1). For assessment purposes, a precautionary scenario is assumed whereby decommissioning activities overlap temporally with construction of the Proposed Development.	phase for assessment purposes. N/A		construction of ABWP2
~~Dublin Array (formerly known as Bray and Kish~~Valorous Offshore ~~Windfarms)~~Windfarm	Proposed	~~25.8~~14 1.9	~~24.9~~141. 3	~~'Relevant Project'. Updated application expected to be made under the MPDM regime. Scoping Report indicates up to 61 wind turbines with up to 308 m tip height and indicative hub height of 165.5 m above mean high water springs (Innogy, 2020).~~Early stage planning	~~2028-~~ 2032~~2029~~	From ~~2033~~2030	Potential ~~for~~ overlap ~~with Proposed Development construction and~~of operational and maintenance phases.

~~Project/Plan~~	~~Status~~	~~Distance from Array Area (km)~~	~~Distance from offshore export cable routes (km)~~	~~Description of Project/Plan~~	~~Dates of Construction (if applicable)~~	~~Dates of Operation (if applicable)~~	~~Overlap with the Proposed Development~~
~~North Irish Sea Array~~Mooir Vannin	~~Proposed~~Planning application submitted	~~65.1~~17 9.2	~~64.1~~178. 2	~~'Relevant Project'. Updated~~ Application ~~expected to be made under the MPDM regime.~~submitted to the Isle of Man Government in 2025. Up to 89 WTGs	~~2027-2029~~2031-2033	From ~~2030~~2033	Potential ~~for~~ overlap ~~with Proposed Development construction and~~of operational and maintenance phases.
~~Oriel Wind Park~~Llyr 1 Windfarm	~~Proposed~~Application submitted	~~108.1~~1 48.0	~~107.2~~14 7.3	~~'Relevant Project'. Updated application expected to be made under the MPDM regime.~~Floating turbine demonstration site with up to 10 turbines	~~2026-2028~~2027	From ~~2029~~2027	Potential for overlap with Proposed Development construction and operational and maintenance phases~~.~~

7.4 ~~7.5~~ In-Combination Assessment

7.4.1 ~~7.5.1~~ Annex I Coastal and Marine Habitats

7.4.1.1 ~~7.5.1.1~~ The in-combination Annex I Coastal and Marine Habitats assessment has ~~considered~~screened in the same potential impacts, SAC and ~~features~~QIs screened in for assessment of the Proposed Development alone (Section 6.2). The additional Plans and Projects considered are listed in Table 7.2 above.

7.4.1.2 Annex I Coastal Habitats are not considered further within the in-combination assessment. No credible pathways for effects were identified for the Proposed Development alone and therefore no potential exists for impacts that interfere with the COs of these habitats at Buckroney-Brittas Dunes and Fen SAC, Magherabeg Dunes and Fen SAC, Kilpatrick Sandhills SAC, The Murrough Wetlands SAC (refer to Sections 6.2.3.7, 6.2.3.18 and 6.2.3.27–6.2.3.28 for further detail). In the absence of any credible pathway or potential effect on COs, in-combination effects on Annex I Coastal Habitats can be excluded.

7.4.1.3 However, as credible pathways for effects were identified for the Proposed Development alone in relation to Annex I Marine Habitats of Wicklow Reef SAC and Blackwater Bank SAC are considered within the in-combination assessment.

7.4.1.4 ~~7.5.1.2~~ Tier 1 projects screened in include ABWP1, subsea cables for ABWP1 and Hibernia Atlantic, Arklow Wastewater Treatment Plant, ABWP2 OMF, ~~ABWP2 OGI and~~ aquaculture for the Irish Mussel Seed Company Ltd and the Arklow Flood Relief Scheme. All Tier 1 projects other than the Phase 1 projects (discussed separately below) and ABWP2 OMF ~~and OGI~~ will be operational at the time construction works of the proposed development commence and the operation and potential decommissioning of these projects may overlap with the construction, operational and maintenance and decommissioning phases of the Proposed Development. The construction of ABWP2 OMF ~~and OGI~~ may overlap with the construction and operational and maintenance phases of the Proposed Development, whilst the operation and decommissioning of ABWP2 OMF ~~and OGI~~ may overlap with the operational and maintenance and decommissioning phases of the Proposed Development. Although the majority of works associated with ABWP2 OMF will be completed onshore, some elements will exist within the offshore environment. For example, plans for the development of the ABWP2 OMF will include a pontoon for vessels and dredging of approximately 6,000 m^3 of material from a nearshore area. ~~The OGI will only contribute to suspended sediment concentrations and associated deposition.~~

7.4.1.5 ~~7.5.1.3 The only Tier 2 project screened in is~~ The Arklow Flood Relief Scheme~~, which will involve~~ involves engineering works along the Avoca River and surrounds. These works will include dredging, installation of flood defence embankments/ walls and gravel/ debris traps. These works will occur between ~~2024-2028~~2026-2030 and may overlap with the construction phase of the Proposed Development. This project only has potential to impact via ~~suspended sediment concentrations~~SSCs and associated deposition.

~~7.5.1.4 The only Tier 3 project screened in is the decommissioning of ABWP1 infrastructure, which will involve the cutting of monopiles at a depth of 2 m below seabed, removal of monopiles and cutting, burial and backfilling of proportions of the inter-array cables. Decommissioning is anticipated to take 4 months between 2025 and 2027 and may overlap with the construction phase of the Proposed Development.~~

7.4.1.6 ~~7.5.1.5~~ Phase 1 projects ~~screened in include~~are also captured in Tier 1 with Codling Wind Park and Dublin Array screened in for Annex I Marine Habitats. The construction phase of Codling Wind Park and Dublin Array may overlap with the construction phase of the Proposed Development. The operation phase of Codling Wind Park and Dublin Array may overlap with the construction and ~~operation~~operational phases of the Proposed Development. ~~Plans~~The planning

application for Dublin Array indicate that the proposed development will comprise a maximum of ~~6~~145 WTGs~~, three OSP's and three export cables (Innogy, 2020~~ and 1 OSP (Kish Offshore Wind Ltd., 2025). Plans for Codling Wind Park indicate that the proposed development may comprise up to ~~140~~75 WTGs~~, 6 export cables~~ and up to ~~5~~three OSPs (~~CWP, 2020)~~Codling Wind Park, 2024). Phase 1 projects show similar construction, operational and decommissioning activities and therefore the impacts and magnitudes of the impacts are expected to be similar in nature to that of the Proposed Development.

7.4.1.7 The only Tier 3 project screened in is the decommissioning of ABWP1 infrastructure, which will involve the cutting of monopiles at a depth of 2 m below seabed, removal of monopiles and cutting, burial and backfilling of proportions of the inter-array cables. The programme for these works are not defined, although for assessment purposes it is assumed that they will overlap with the construction phase of the Proposed Development..

Construction and Decommissioning

ELEVATED LEVELS OF SUSPENDED SEDIMENT CONCENTRATIONS AND ASSOCIATED DEPOSITION

7.4.1.8 ~~7.5.1.6~~ The following in-combination assessment considers the Wicklow Reef SAC which is designated for Reefs and Blackwater Bank SAC which is designated for Sandbanks which are slightly covered by seawater all the time.

7.4.1.9 ~~7.5.1.7~~ There is the potential for in-combination elevated levels of ~~suspended sediment concentrations~~SSCs and associated deposition as a result of both the construction and decommissioning activities associated with the Proposed Development and the Tier 1, 2, and 3 ~~and Phase 1~~ projects identified in Table 7.2.

TIER 1 PROJECTS

7.4.1.10 ~~7.5.1.8~~ From the Tier 1 projects, elevated levels of ~~suspended sediment concentrations~~SSCs and associated deposition may occur ~~as a result of~~ as a result of the installation of the pontoon and associated dredging required for the ABWP2 OMF ~~and construction of the ABWP2 OGI~~. All other Tier 1 projects (with the exception of Phase 1 projects which are discussed below) will be operational during the construction phase of the Proposed Development. However, increased ~~suspended sediment concentrations~~SSCs and associated deposition may occur as a result of any repair and maintenance activities required to infrastructure for ABWP1, ABWP1 and Hibernia Atlantic subsea cables and the long sea outfall for the Arklow Waste Water Treatment Plant. ~~Elevated levels of suspended sediment concentrations and associated~~From the Phase 1 projects, elevated = SSCs and associated deposition may occur as a result the installation of WTGs, OSPs and associated cables during the construction phase of Codling Wind Park and Dublin Array, and during any repair and maintenance activities required and/ or decommissioning activities associated with the developments at the end of their project timelines. Elevated SSCs and associated deposition during construction and operational and maintenance activities as part of the Tier 1 projects are expected to be temporary and intermittent, with sediment plumes expected to quickly dissipate following cessation of activities. Any areas likely to be exposed to heavy sediment deposition are expected to be localised and small in the context of subtidal habitats within the Annex I Coastal and Marine Habitats ZoI, being 20 km. Elevated ~~levels of suspended sediment concentrations~~SSCs and associated deposition are not anticipated to occur during the operational phase activities of the ~~aquaculture of shellfish from the~~ Irish Mussel Seed Company Ltd, so ~~are~~that has not been considered here. As highlighted within the alone assessment (Section 6.2), the results of the modelling (NIS Volume III, Appendix 6.1: Marine Physical Processes Numerical Modelling (Revised March 2026)) confirm that there is no potential for construction phase sediment plumes or associated sediment deposition to reach the QIs within the European sites designated for Annex I Coastal and Marine habitats.

7.4.1.11 ~~7.5.1.9~~ **Therefore, it is concluded that there will be no AEoI from the Proposed Development in-combination with Tier 1 Projects as a result of elevated levels of ~~suspended sediment concentrations~~SSCs on 'Reefs' or 'Sandbanks which are slightly covered by seawater all the time' from Project Design Option 1.**

7.4.1.12 ~~7.5.1.10~~ **Based on the ~~increased~~same potential risk of in-combination effects ~~of~~as Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

TIER ~~2 PROJECTS~~

~~7.5.1.11~~ 1 AND ~~DUE TO THE NATURE OF THE WORK DURING THE CONSTRUCTION PHASE IT IS CONSIDERED THAT ANY IMPACTS THAT OCCUR WILL BE TEMPORARY AND LOCALISED. INTERACTION BETWEEN SEDIMENT PLUMES GENERATED BY THE FLOOD RELIEF WORK AND THE CONSTRUCTION WORKS ASSOCIATED WITH THE PROPOSED DEVELOPMENT COULD OCCUR IN TWO WAYS:~~

- ~~Where plumes generated from the two different activities meet and coalesce to form one larger plume; or~~
- ~~Where seabed sediment disturbance occurs within the plume generated by Proposed Development's construction activities (or vice versa).~~

~~7.5.1.12 Within the options considered above, the physical laws of dispersion theory mean concentrations within the plumes are not additive but instead a larger plume is created, with regions of potentially differing concentrations representative of the separate respective plumes. In contrast, in the case of plumes formed by dredging operating within the plume created by foundation installation or bed preparation activities (or vice versa), the two plumes would be additive, creating a plume with higher SSC. The assessment undertaken for the Proposed Development alone shows that in almost all cases, sediment plumes are rapidly indistinguishable from background levels. Furthermore, the assessment also indicates that the sediment plumes disperse along the north-south orientated tidal axis which further limits the potential for sediment plumes from Proposed Development activities to interact with those from other activities resulting in seabed disturbance.~~

~~7.5.1.13 **Therefore, when considered in combination, it is concluded that there will be no AEoI from the Proposed Development in-combination with Tier 2 Project as a result of elevated levels of suspended sediment concentrations on 'Reefs' or 'Sandbanks which are slightly covered by seawater all the time' from Project Design Option 1.**~~

~~7.5.1.14 **Based on the increased risk of in-combination effects of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**~~

TIER 3 PROJECTS

7.4.1.13 ~~7.5.1.15~~ Elevated levels of ~~suspended sediment concentrations~~SSCs and associated deposition may occur as a result of the anticipated decommissioning of seven wind turbines for ABWP1. Elevated levels of ~~suspended sediment concentrations~~SSCs and associated deposition during decommissioning activities as part of ABWP1 are expected to be temporary and intermittent, with sediment plumes expected to quickly dissipate following cessation of activities. Any areas likely to be exposed to heavy sediment deposition are expected to be localised and small in the context of subtidal habitats within the Coastal and Marine Habitats ZoI, being 20 km. As highlighted within the alone assessment (Section 6.2), the results of the modelling (NIS Volume III, Appendix 6.1: Marine Physical Processes Numerical Modelling (Revised March 2026)) confirm that there is no potential for construction phase sediment plumes or associated sediment deposition to reach the QIs within the European sites designated for Coastal and Marine habitats.

7.4.1.14 ~~7.5.1.16~~ **Therefore, it is concluded that there will be no AEoI from the Proposed Development in-combination with Tier 3 Projects as a result of elevated levels of**

~~suspended sediment concentrations~~SSCs on 'Reefs' or 'Sandbanks which are slightly covered by seawater all the time' from Project Design Option 1.

7.4.1.15 ~~7.5.1.17~~ **Based on the ~~increased~~same potential risk of in-combination effects ~~of~~as Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

~~PHASE 1 PROJECTS~~

~~7.5.1.18 From the Phase 1 projects, elevated levels of suspended sediment concentrations and associated deposition may occur as a result the installation of WTGs, OSPs and associated cables during the construction phase of Codling Wind Park and Dublin Array, and during any repair and maintenance activities required for Codling Wind Park, and/ or decommissioning activities associated with the development at the end of their project timelines. Elevated levels of suspended sediment concentrations and associated deposition during construction and operation activities as part of Phase 1 projects are expected to be temporary and intermittent, with sediment plumes expected to quickly dissipate following cessation of activities. Any areas likely to be exposed to heavy sediment deposition are expected to be localised and small in the context of subtidal habitats within the Coastal and Marine Habitats ZoI, being 20 km. As highlighted within the alone assessment (Section 6.2), the results of the modelling (Volume III, Appendix 6.1: Marine Physical Processes Numerical Modelling) confirm that there is no potential for construction phase sediment plumes or associated sediment deposition to reach the QIs within the European sites designated for Coastal and Marine habitats.~~

~~7.5.1.19 **Therefore, it is concluded that there will be no AEoI from the Proposed Development in-combination with Phase 1 Projects as a result of elevated levels of suspended sediment concentrations on 'Reefs' or 'Sandbanks which are slightly covered by seawater all the time' from Project Design Option 1.**~~

~~7.5.1.20 **Based on the increased risk of in-combination effects of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**~~

ACCIDENTAL POLLUTION

7.4.1.16 ~~7.5.1.21~~ The following in-combination assessment considers the Wicklow Reef SAC which is designated for Reefs and Blackwater Bank SAC which is designated for Sandbanks which are slightly covered by seawater all the time.

7.4.1.17 ~~7.5.1.22~~ There is the potential for in-combination accidental pollution as a result of both the construction and decommissioning activities associated with the Proposed Development and the Tier 1~~,~~ and 3 ~~and Phase 1~~ projects identified in Table 7.2.

TIER 1 PROJECTS

7.4.1.18 ~~7.5.1.23~~ From the Tier 1 projects (other than Phase 1 projects), accidental pollution may occur as a result of any vessels and machinery required during the installation of the pontoon and associated dredging required for the Arklow ABWP2 OMF. In relation to Phase 1 projects, accidental pollution may occur as a result of any vessels and machinery required for the installation of WTGs, OSPs and associated cables during the construction phase of Codling Wind Park and Dublin Array, and during any repair and maintenance activities required for both developments. All other Tier 1 projects will be operational during the construction phase of the Proposed Development and accidental pollution may occur as a result of vessels and machinery required during operational and maintenance activities. Accidental pollution during construction activities as part of the Tier 1 projects is expected to be highly infrequent and of short-term duration where any chemicals released to the water column will be quickly dispersed and diluted via currents and other water movement. As highlighted within the alone assessment (Section 6.2), the avoidance of effect through factored in measures for the Proposed Development includes an

EMP (Appendix 25.1) and Marine Pollution Contingency Plan (Annex 2 of Appendix 25.1). Adherence to the avoidance by design measures outlined in Table 6.2 and good working practices will significantly reduce the likelihood of an accidental pollution incident occurring. Given the factored-in measures, the likelihood of accidental release is considered to be extremely low.

7.4.1.19 ~~7.5.1.24~~ **Therefore, it is concluded that there will be no AEoI from the Proposed Development in-combination with Tier 1 Projects as a result of accidental pollution on 'Reefs' or 'Sandbanks which are slightly covered by seawater all the time' from Project Design Option 1.**

7.4.1.20 ~~7.5.1.25~~ **Based on the ~~increased~~representative risk of in-combination effects of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

TIER 1 AND TIER 3 PROJECTS

7.4.1.21 ~~7.5.1.26~~ Accidental pollution may occur as a result of any vessels and machinery required as a result of a result of the anticipated decommissioning of seven wind turbines for ABWP1. Accidental pollution during decommissioning activities as part of ABWP1 are expected to be highly infrequent and of short-term duration where any chemicals released to the water column will be quickly dispersed and diluted via currents and other water movement. As highlighted within the alone assessment (Section 6.2), the avoidance of effect through factored in measures for the Proposed Development includes an EMP and Marine Pollution Contingency Plan. Adherence to the avoidance by design measures outlined in Table 6.2 and good working practices will significantly reduce the likelihood of an accidental pollution incident occurring. Given the factored-in measures, the likelihood of accidental release is considered to be extremely low.

7.4.1.22 ~~7.5.1.27~~ **Therefore, it is concluded that there will be no AEoI from the Proposed Development in-combination with Tier 3 Projects as a result of accidental pollution on 'Reefs' or 'Sandbanks which are slightly covered by seawater all the time' from Project Design Option 1.**

7.4.1.23 ~~7.5.1.28~~ **Based on the ~~increased~~representative risk of in-combination effects of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

~~PHASE 1 PROJECTS~~

~~7.5.1.29 From the Phase 1 projects, accidental pollution may occur as a result of any vessels and machinery required for the installation of WTGs, OSPs and associated cables during the construction phase of Codling Wind Park and Dublin Array, and during any repair and maintenance activities required for Codling Wind Park. Accidental pollution during construction and operation activities as part of Codling Wind Park and Dublin Array are expected to be highly infrequent and of short-term duration where any chemicals released to the water column will be quickly dispersed and diluted via currents and other water movement. As highlighted within the alone assessment (Section 6.2), the avoidance of effect through factored in measures for the Proposed Development includes an EMP and Marine Pollution Contingency Plan. Adherence to the avoidance by design measures outlined in~~ Table 6.2 ~~and good working practices will significantly reduce the likelihood of an accidental pollution incident occurring. Given the factored-in measures, the likelihood of accidental release is considered to be extremely low.~~

~~7.5.1.30 **Therefore, it is concluded that there will be no AEoI from the Proposed Development in-combination with Phase 1 Projects as a result of accidental pollution on 'Reefs' or 'Sandbanks which are slightly covered by seawater all the time' from Project Design Option 1.**~~

~~7.5.1.31 **Based on the increased risk of in-combination effects of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**~~

ELEVATED LEVELS OF SUSPENDED SEDIMENT CONCENTRATIONS AND ASSOCIATED DEPOSITION

7.4.1.24 ~~7.5.1.32~~ The following in-combination assessment considers the Wicklow Reef SAC which is designated for Reefs and Blackwater Bank SAC which is designated for Sandbanks which are slightly covered by seawater all the time.

7.4.1.25 ~~7.5.1.33~~ There is the potential for in-combination elevated levels of ~~suspended sediment concentrations~~SSCs and associated deposition as a result of the ~~operation~~operational and maintenance activities associated with the Proposed Development and the Tier 1~~,~~ and 2 ~~and Phase 1~~ projects identified in Table 7.2.

TIER 1 PROJECTS

7.4.1.26 ~~7.5.1.34~~ From the Tier 1 projects (other than Phase 1 projects), elevated levels of ~~suspended sediment concentrations~~SSCs and associated deposition may occur as a result of the installation of the pontoon and associated dredging required for the Arklow ABWP2 OMF during construction and any repair and maintenance required during operation. In relation to Phase 1 projects, elevated levels of SSCs and associated deposition may occur as a result of the installation of WTGs, OSPs and associated cables during the construction phase of Codling Wind Park and Dublin Array, and during any repair and maintenance activities associated with Codling Wind Park and Dublin Array. All other Tier 1 projects will be operational during the operational and maintenance phase of the Proposed Development and therefore, increased ~~suspended sediment concentrations~~SSCs and associated deposition may also occur as a result of any operational and maintenance activities required for these projects. Elevated levels of ~~suspended sediment concentrations~~SSCs and associated deposition during the construction and operation activities as part of the Tier 1 projects are expected to be temporary and intermittent, with sediment plumes expected to quickly dissipate following cessation of activities. Any areas likely to be exposed to heavy sediment deposition are expected to be localised and small in the context of subtidal habitats within the Coastal and Marine Habitats ZoI, being 20 km. Elevated levels of ~~suspended sediment concentrations~~SSCs and associated deposition are not anticipated to occur during the operational phase of the aquaculture of shellfish from the Irish Mussel Seed Company Ltd, so ~~are~~this has not been considered here. As highlighted within the alone assessment (Section 6.2), the results of the modelling (NIS Volume III, Appendix 6.1: Marine Physical Processes Numerical Modelling (Revised March 2026)) confirm that there is no potential for construction phase sediment plumes or associated sediment deposition to reach the QIs within the European sites designated for Coastal and Marine habitats. Any sediment plumes and associated deposition during operation are expected to be smaller than those during construction and as a result, there will be no potential for these to reach the QIs within the European sites designated for Coastal and Marine habitats.

7.4.1.27 ~~7.5.1.35~~ **Therefore, it is concluded that there will be no AEoI from the Proposed Development in-combination with Tier 1 Projects as a result of elevated levels of ~~suspended sediment concentrations~~SSCs and associated deposition on 'Reefs' or 'Sandbanks which are slightly covered by seawater all the time' from Project Design Option 1.**

7.4.1.28 ~~7.5.1.36~~ **Based on the ~~increased~~representative risk of in-combination effects of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

TIER 2 PROJECTS

7.5.1.37 Sediment plumes from operational and maintenance activities are generally short-lived, with major maintenance works being infrequent. Interaction between sediment plumes generated by the flood relief work and the operational and maintenance works associated with the proposed development could occur in two ways:

- Where plumes generated from the two different activities meet and coalesce to form one larger plume; or
- Where seabed sediment disturbance occurs within the plume generated by Proposed Development's construction activities (or vice versa).

7.5.1.38 Within the options considered above, the physical laws of dispersion theory mean concentrations within the plumes are not additive but instead a larger plume is created, with regions of potentially differing concentrations representative of the separate respective plumes. In contrast, in the case of plumes formed by dredging operating within the plume created by foundation installation or bed preparation activities (or vice versa), the two plumes would be additive, creating a plume with higher SSC. The assessment undertaken for the Proposed Development alone shows that in almost all cases, sediment plumes are rapidly indistinguishable from background levels. Furthermore, the assessment also indicates that the sediment plumes disperse along the north-south orientated tidal axis which further limits the potential for sediment plumes from Proposed Development activities to interact with those from other activities resulting in seabed disturbance.

7.5.1.39 **Therefore, when considered in combination, it is concluded that there will be no AEoI from the Proposed Development in-combination with Tier 2 Project as a result of elevated levels of suspended sediment concentrations on 'Reefs' or 'Sandbanks which are slightly covered by seawater all the time' from Project Design Option 1.**

7.5.1.40 **Based on the increased risk of in-combination effects of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

PHASE 1 PROJECTS

7.5.1.41 From the Phase 1 projects, elevated levels of suspended sediment concentrations and associated deposition may occur as a result of the installation of WTGs, OSPs and associated cables during the construction phase of Dublin Array, and during any repair and maintenance activities associated with Codling Wind Park and Dublin Array. Elevated levels of suspended sediment concentrations and associated deposition during operation activities as part of Phase 1 projects are expected to be temporary and intermittent, with sediment plumes expected to quickly dissipate following cessation of activities. Any areas likely to be exposed to heavy sediment deposition are expected to be localised and small in the context of subtidal habitats within the Coastal and Marine Habitats ZoI, being 20 km. As highlighted within the alone assessment (Section 6.2), the results of the modelling (Volume III, Appendix 6.1: Marine Physical Processes Numerical Modelling) confirm that there is no potential for construction phase sediment plumes or associated sediment deposition to reach the QIs within the European sites designated for Coastal and Marine habitats. Any sediment plumes and associated deposition during operation are expected to be smaller than those during construction and as a result, there will be no potential for these to reach the QIs within the European sites designated for Coastal and Marine habitats.

7.5.1.42 **Therefore, it is concluded that there will be no AEoI from the Proposed Development in-combination with Phase 1 Projects as a result of elevated levels of suspended sediment concentrations and associated deposition on 'Reefs' or 'Sandbanks which are slightly covered by seawater all the time' from Project Design Option 1.**

7.5.1.43 **Based on the increased risk of in-combination effects of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

ACCIDENTAL POLLUTION

7.4.1.29 ~~7.5.1.44~~ The following in-combination assessment considers the Wicklow Reef SAC which is designated for Reefs and Blackwater Bank SAC which is designated for Sandbanks which are slightly covered by seawater all the time.

7.4.1.30 ~~7.5.1.45~~ There is the potential for in-combination accidental pollution as a result of the operation activities associated with the Proposed Development and the Tier ~~1 and Phase 1 projects~~1projects identified in Table 7.2.

TIER 1 PROJECTS

7.4.1.31 ~~7.5.1.46~~ From the Tier 1 projects (other than Phase 1 projects), accidental pollution may occur as a result of any vessels and machinery required during the installation of the pontoon and associated dredging required for the Arklow ABWP2 OMF. In relation to Phase 1 projects, accidental pollution may occur as a result of any vessels and machinery required during the construction and operational phases of Dublin Array and the operational phase of Codling Wind Park. All other Tier 1 projects will be operational during the operational phase of the Proposed Development and accidental pollution may occur as a result of vessels and machinery required during operational and maintenance activities. Accidental pollution during construction and operational activities as part of the Tier 1 projects is expected to be highly infrequent and of short-term duration where any chemicals released to the water column will be quickly dispersed and diluted via currents and other water movement. As highlighted within the alone assessment (Section 6.2), the avoidance of effect through factored in measures for the Proposed Development includes an EMP and Marine Pollution Contingency Plan. Adherence to the avoidance by design measures outlined in Table 6.2 and good working practices will significantly reduce the likelihood of an accidental pollution incident occurring. Given the factored-in measures, the likelihood of accidental release is considered to be extremely low.

7.4.1.32 ~~7.5.1.47~~ **Therefore, it is concluded that there will be no AEoI from the Proposed Development in-combination with Tier 1 Projects as a result of accidental pollution on 'Reefs' or 'Sandbanks which are slightly covered by seawater all the time' from Project Design Option 1.**

7.4.1.33 ~~7.5.1.48~~ **Based on the ~~increased~~representative risk of in-combination effects of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

CHANGES IN PHYSICAL PROCESSES

7.4.1.34 The following in-combination assessment considers the Wicklow Reef SAC which is designated for Reefs and Blackwater Bank SAC which is designated for Sandbanks which are slightly covered by seawater all the time.

7.4.1.35 There is the potential for in-combination elevated levels of changes in physical processes as a result of the operational and maintenance activities associated with the Proposed Development and the Tier 1 projects identified in Table 7.2.

~~PHASE~~TIER 1 PROJECTS

~~7.5.1.49 From the Phase 1 projects, accidental pollution may occur as a result of any vessels and machinery required during the construction and operational phases of Dublin Array and the operational phase of Codling Wind Park. Accidental pollution during construction and operational activities as part of Codling Wind Park and Dublin Array are expected to be highly infrequent and of short-term duration where any chemicals released to the water column will be quickly dispersed and diluted via currents and other water movement. As highlighted within the alone assessment (Section 6.2), the avoidance of effect through factored in measures for the Proposed Development includes an EMP and Marine Pollution Contingency Plan. Adherence to the~~

~~avoidance by design measures outlined in~~ Table 6.2 ~~and good working practices will significantly reduce the likelihood of an accidental pollution incident occurring. Given the factored-in measures, the likelihood of accidental release is considered to be extremely low.~~

7.4.1.36 From the Tier 1 projects, alteration of seabed habitats arising from changes in physical processes may occur as a result of the presence of offshore infrastructure such as the pontoon for ABWP2, WTGs, OSPs for ABWP1, Codling Wind Park and Dublin Array, cables and cable protected associated with ABWP1 and Hibernia Atlantic, and the long-sea outfall associated with the Arklow Waste Water Treatment Plant. Any alteration of seabed habitat associated with the other Tier 1 projects is expected to be highly localised and restricted to discrete areas within the project areas. Therefore, the magnitude of impact is considered to be Low.

7.4.1.37 However, as detailed in numerical modelling designed to assess the impacts of the Proposed Development during the operational and maintenance phase on tidal currents, sediment transport and seabed dynamics (Deltares, 2026) indicates that any effects are not anticipated to extend to the regional or larger-scale sediment transport pathways in the south-western Irish sea (see Section 6.2.1). Similarly, the modelling indicates that morphological and sediment transport changes at Arklow Bank appear to be insufficient to affect the morphological behaviour of receptors within the wider morphological system.

7.4.1.38 ~~7.5.1.50~~ **Therefore, it is concluded that there will be no AEoI from the Proposed Development in-combination with ~~Phase~~Tier 1 Projects as a result of ~~accidental pollution~~changes in physical processes on 'Reefs' or 'Sandbanks which are slightly covered by seawater all the time' from Project Design Option 1.**

7.4.1.39 ~~7.5.1.51~~ **Based on the ~~increased~~representative risk of in-combination effects of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

7.4.2 ~~7.5.2~~ Annex II Marine Mammal Species

7.4.2.1 The specific projects relevant to the Annex II marine mammal QIs in the in-combination assessment, along with the tiers to which they have been allocated, are presented in Table 7.4.

Screening impact pathways

7.4.2.2 ~~7.5.2.1~~ Certain impacts assessed ~~solely~~ for the Proposed Development alone are not ~~factored~~incorporated into the Annex II marine mammal QIs in-combination assessment due to several factors:

- The impacts are highly localised in nature;
- Existing management and mitigation measures implemented ~~at~~for the Proposed Development and other projects will effectively diminish the likelihood of these impacts; and
- The potential ~~significance of the~~ effect ~~from~~of the Proposed Development alone ~~has been evaluated as either Not Significant (due to Negligible conclusion for magnitude of impact) or Imperceptible (due to Negligible conclusion for sensitivity of the receptor).~~is negligible, meaning there is no plausible mechanism by which these impacts could comprise site integrity or the COs of relevant European sites.

7.4.2.3 ~~7.5.2.2 The~~Based on the criteria above, the following impacts listed in Table 6.8 are excluded from the Annex II marine mammal QIs in-combination assessment ~~for these reasons encompass~~:

- *Auditory injury (PTS):* While activities such as pile driving ~~and~~, UXO clearance and site surveys may lead to PTS, ~~but~~ robust mitigation measures ~~will be enforced to minimise injury risk to marine mammals~~ (Table 6.7) will be implemented to reduce the risk of auditory injury to relevant Annex II marine mammals QIs to imperceptible levels~~, as mandated by European Protected Species (EPS) legislation~~;

- *Injury from vessel activities:* It is anticipated that all offshore energy projects will adopt a ~~EVMP~~Environmental VMP (or similar) or adhere to established guidelines to further ~~reduce~~minimise the already ~~minimal~~low risk of vessel collisions with Annex II marine ~~mammals~~mammal QIs;
- *Disturbance from ~~vessel activities: Similar to collision risks, it is~~vessels*: It is also expected that all offshore energy projects will implement ~~a EVMP~~an Environmental VMP or adhere to best practice recommendations to mitigate the potential for disturbance ~~to~~(due to vessel behaviour) to Annex II marine ~~mammals;~~ mammal QIs.
- *Injury and disturbance from dredging and trenching*: Impacts are highly localised and minor, and no EDR is identified for these activities (JNCC, 2025), reflecting the negligible likelihood of these activities contributing to in-combination disturbance;
- *Changes in fish and shellfish community affecting prey resources:* Potential changes in prey availability are highly localised and ~~Not Significant.~~temporary, with no plausible risk to site integrity;
- *Changes in EMF from subsea cabling*: Predicted changes are of imperceptible significance and not expected to affect site integrity; and
- *Accidental pollution:* It is anticipated that all offshore energy projects will implement an EMP to ensure that the potential release from pollutants is minimised and strictly controlled~~; and~~.

~~• Changes in EMF from subsea cabling: Changes are of Imperceptible significance.~~

7.4.2.4 ~~7.5.2.3 Consequently~~Accordingly, the impacts ~~considered within~~included in the Annex II marine mammal QIs in-combination assessment ~~are primarily focused on the~~focus on potential for behavioural disturbance arising from underwater noise associated with impulsive or specific high-energy sources (piling, UXO clearance and certain confirmatory surveys) during the construction and decommissioning phases of other offshore developments~~. The projects screened in for the in-combination assessment are presented in~~ Table 7.4, where data for these developments are available.

7.4.2.5 For the Proposed Development alone, the only pathways assessed during the decommissioning phase comprise injury and disturbance from vessel activities, changes in fish and shellfish community affecting prey resources, and accidental pollution. All of these pathways are expected to generate impacts that are highly localised, mitigated through the implementation of standard measures, or otherwise negligible. Recognising that decommissioning activities generally generate similar or lower levels of disturbance compared with construction, it can be concluded that any in-combination effects during the decommissioning phase would be equivalent to, or lower than those already assessed for the construction phase, and are therefore, not expected to result in any adverse effect on the integrity of Natura 2000 sites.

7.4.2.6 Indicative construction programme information for the Phase One projects were informed by the latest available planning application documentation in the public domain, reviewed in response to the ACP RFIs. The indicative construction periods applied within the Annex II marine mammal in-combination assessment are:

- Proposed Development: 2027 – 2030;
- Codling Wind Park: 2026 – 2029;
- Dublin Array: 2029 – 2032;
- NISA: 2027 –2030; and
- Oriel: 2028 – 2030.

7.4.2.7 These construction periods represent overall construction windows and may include foundation installation, cable installation and other associated activities. Given the uncertainty in final construction schedules, a precautionary approach has been applied whereby construction, operation and maintenance, and decommissioning activities associated with the Phase One

projects are assumed to temporally overlap with those of the Proposed Development. As all Phase One projects comprise of broadly similar activities, the resulting impacts are expected to be similar in nature to those associated with the Proposed Development, with in-combination effects primarily driven by spatial proximity and temporal overlap.

7.4.2.8 For the purposes of the in-combination assessment, decommissioning activities are only considered for other offshore wind projects that are currently approaching the end of their operational lifetime and for which sufficient information exists to indicate that decommissioning could reasonably coincide with the planned construction and other noisy activities of the Proposed Development. This reflects that the potential for in-combination effects on Annex II marine mammal QIs would be greatest where multiple projects are concurrently undertaking activities that generate impulsive underwater noise (e.g. piling or UXO clearance). Where information on decommissioning timing or methods is not available, it is assumed that the decommissioning activities would generate underwater noise levels similar to, or lower than, those associated with construction, in line with the industry standard approach to impact assessments for marine mammals. As such, only offshore wind projects with reasonably foreseeable decommissioning activities at a time that overlaps with the Proposed Development are considered in the assessment.

7.4.2.9 In addition, while site surveys and other routine activities may occur during the operational and maintenance phase of the Proposed Development, these have not been included in the Annex II marine mammal QIs in-combination assessment. The precise nature of site surveys during the operational and maintenance phase is unknown, however such surveys will be used to inspect cables which typically utilises sources that have negligible potential to disturb marine mammals due to their high-frequency sources, low source output, and directionality. As a result, the overall spatial extent of potential exposure is minimal, and these operational and maintenance site survey activities are not expected to contribute meaningfully to in-combination disturbance of Annex II marine mammal QIs.

Assessment Methodology

7.4.2.10 The temporal scope considered for the Annex II marine mammal QI in-combination assessment spans 2021 to 2034 inclusive. This timeframe allows for a quantitative assessment of impacts to SACs with Annex II marine mammal QIs both prior to the construction of the Proposed Development (using baseline data compiled from 2021 onwards), and during the anticipated construction window of the Proposed Development. The Proposed Development is expected to be constructed between 2027 and 2030, with piling scheduled for 2028 and UXO clearance occurring in 2027.

7.4.2.11 For the Proposed Development, the indicative number of Annex II marine mammal QIs disturbed per day has been taken as the maximum daily number calculated from the alone assessments (Section 6.4), based on the precautionary scenario generating the largest predicted disturbance ranges and applying the highest species-specific density estimates (Table 6.6). This approach ensures that the in-combination reflects the upper-bound disturbance scenario, providing robust conclusions under uncertainty associated with the other projects. As a result, the predicted numbers are likely to represent an overestimate of actual disturbance on any given day.

7.4.2.12 For all other offshore projects (including Phase One projects), the indicative number of animals disturbed per day has been calculated using species-specific densities within the corresponding SCANS-IV survey blocks for each cetacean species (Gilles *et al.,* 2023), and average modelled at-sea density estimates for both pinniped species (Carter *et al.*, 2020), alongside a fixed EDR approach. For projects that are situated outside of the SCANS-IV survey boundaries, cetacean densities were derived from the corresponding ObSERVE survey strata (Rogan *et al.,* 2018; Giralt Paradell *et al.*, 2024). However, it is important to note that this approach is highly precautionary, given the high level of uncertainty with large-scale density estimates, the assumptions inherent

in applying fixed EDRs, and the limited availability of project-specific information for other offshore developments, as described in further detail below.

7.4.2.13 The EDR threshold parameters used to assess the number of Annex II marine mammal QIs potentially disturbed from offshore projects are based on the updated JNCC (2025) guidance. Under this guidance, the EDR applied to unabated pile driving and high order UXO detonation is the same. As a result, disturbance arising from these activities is assessed collectively as high-noise construction activities, without disaggregating effects by activity type. This reflects current best available guidance and avoids artificial separation of impacts where the spatial extent of disturbance is identical.

7.4.2.14 The EDRs and corresponding impact areas applied within the Annex II marine mammal QI in-combination assessment are summarised as:

- A 20 km EDR for piling of all offshore windfarm projects (fixed and floating) in UK and Irish waters (including Phase One projects), based on guidance from JNCC (2025) for unabated pile driving of a monopile. This results in an impact area of 1,256.64 km^2 for other projects, and 1,159.98 km^2 for the Proposed Development given location relative to the coast;
- A 20 km EDR for UXO clearance based on the high order detonation of UXOs without noise abatement only (JNCC, 2025), resulting in an impact area of 1,256.64 km^2;
- A 11 km EDR for piling of EU offshore windfarm projects (excluding UK and Irish waters), based on the current noise abatement expectations in those countries, resulting in an impact area of 380.13 km^2;
- A 10 km EDR for seismic surveys based on guidance from JNCC (2025), and an impact area of 314.16 km^2;
- A 5 km EDR for tidal and wave projects (assuming that low-level activities such as sheet or conductor piling may occur), resulting in an impact area of 78.5 km^2; and
- A 5 km EDR for subsea cabling, based on guidance from JNCC (2025) (assuming that only geophysical surveys will be undertaken), resulting in an impact area of 78.5 km^2.

7.4.2.15 These EDRs relate to specific noise-generating activities and are independent of the project phase, as such they can be used where comparable activities occur during any phase (such as foundation removal, cutting, or UXO clearance during decommissioning).

7.4.2.16 Seismic surveys have been considered as Tier 3 projects as the potential number of seismic surveys that could be undertaken is unknown. Based on the size of the relative species-specific MU and its location, it has been assumed that there could be:

- One seismic survey occurring on any given day in the Irish Sea MU included within the in-combination assessment for bottlenose dolphin; and
- Two seismic surveys occurring on any given day in the Celtic and Irish Sea MU within the in-combination assessment for harbour porpoise.

7.4.2.17 Given that the East region of RoI populations for Annex II seal species (grey seal and harbour seal) are largely restricted to nearshore coastal habitats centred around haul-out sites, and seismic surveys typically occur in offshore areas beyond these core use ranges, the potential for spatial overlap is considered to be very limited. On this basis, no realistic pathway for in-combination effects from seismic surveys on Annex II seal QIs is identified, and such are activities are not considered within this in-combination assessment for seals.

7.4.2.18 To estimate the number of Annex II cetaceans predicted to be disturbed from in-combination seismic surveys, the average density across the seas in which they are assumed to occur was calculated using the abundance of the corresponding SCANS-IV survey blocks:

- Harbour porpoise density of 0.162 animals/km^2; and
- Bottlenose dolphin density of 0.350 animals/km^2.

CUMULATIVE IPCOD MODELLING

7.4.2.19 Given the proximity of the Phase One offshore wind projects, there is potential for in-combination disturbance of marine mammals from underwater noise during piling. To estimate potential population consequences of in-combination disturbance from piling on Annex II marine mammal QIs (harbour porpoise, bottlenose dolphin, grey seal, and harbour seal), the iPCoD framework (Harwood *et al.*, 2014; King *et al.*, 2015) was applied (NIS Volume III, Appendix 11.3: Phase 1 Irish Offshore Wind Farms: Cumulative iPCoD Modelling).

7.4.2.20 iPCoD combined predicted impacts of disturbance for each projects in isolation to assess cumulative effects on the population, providing a link between disturbance and population-level outcomes. The scenarios considered in the modelling captured the range of foundation types and piling activity across Phase One projects during the construction period, providing precautionary estimates of in-combination disturbance while accounting for variation in noise output and spatial disturbance patterns :

- *Scenario 1:* Monopiles at all five Phase One projects; and
- *Scenario 2:* Monopiles at the Proposed Development, Oriel, Codling Wind Park; with pin pile jackets at NISA and Dublin Array.

7.4.2.21 The iPCoD modelling methodology, input parameters used, and assumptions made are fully described in NIS Volume III, Appendix 11.3: Phase 1 Irish Offshore Wind Farms: Cumulative iPCoD Modelling. The conservative nature of the scenarios and built-in precautions ensure that the results provide robust, precautionary estimates of population-level effects.This assessment follows best practice and uses the best available scientific information, providing a sufficient basis for assessing potential population-level consequences, although precaution should be applied when interpreting the results and subsequently in making conclusions.

7.4.2.22 To note, the iPCoD modelling has been undertaken against the species-specific MU population rather than any specific SAC population. As such, it provides valuable contextual information on the potential for regional-level population impacts, but does not provide specific information on the potential for impacts to SAC-specific populations.

ASSUMPTIONS AND PRECAUTION

7.4.2.23 In-combination assessments over large spatial scales require a number of assumptions, which introduce high levels of precaution. As a result, the estimated effects are likely overly conservative. The main areas of precaution in this assessment are:

- *High order UXO detonation*: Assumption for all projects due to lack of information regarding preferences for low order methodologies per project (which would have a 5 km EDR);
- *Piling assumptions for offshore wind*: All floating and fixed offshore wind projects are assumed to involve monopiles or pin piles without noise abatement on a precautionary basis given a lack of information on foundation types and mitigation that could be used to reduce noise exposure;
- *Temporal overlap*: Piling or UXO clearance are assumed to occur at any time during the construction period (though not at the same time), potentially over consecutive years, leading to higher in-combination disturbance than would occur in reality;
- *Number of concurrent projects*: Assumes all relevant offshore projects and developments are active simultaneously, which is unlikely given vessel and logistical constraints.
- *Tier 3 projects and limited information:* Lower tier developments (Tier 3) with limited or no public data (i.e. no ES/PEIR) are included using precautionary assumptions in the absence of other information;
- *Spatial overlap*: Impact footprints are assumed to be additive across projects, without accounting for actual overlap, likely overestimating in-combination disturbance;

- *EDR application*: Assumption that the EDRs developed for harbour porpoise can be applied across all Annex II marine mammal QIs; other species are generally less sensitive, therefore this is considered conservative;
- *EDR limits*: Published EDRs reflect areas of bulk effect had been detected, not maximum avoidance distance. Evidence suggests animals may habituate to repeated piling, so actual disturbance may be lower than assumed (Graham *et al.,* 2019);
- *Seismic surveys*: Assumed to occur continuously throughout survey days, whereas in practice airguns are switched off between survey lines (i.e. turns can take 2-3 hours and several can occur in a single day; BEIS, 2020), reducing actual exposure; and
- *Absence of project-specific noise modelling*: Where modelling is unavailable, standard EDRs are applied, which may overestimate disturbance compared with outputs from detailed noise modelling.

Construction and Decommissioning Phase Assessment

DISTURBANCE FROM UNDERWATER NOISE ON HARBOUR PORPOISE ~~– PILING ACTIVITIES~~

7.4.2.24 ~~7.5.2.4~~ The following are the designated sites for harbour porpoise considered within this in-combination assessment:

- Blackwater Bank SAC;
- Rockabill to Dalkey Island SAC;
- Codling Fault Zone SAC;
- West Wales Marine/ Gorllewin Cymru Forol SAC;
- Carnsore Point SAC;
- North Anglesey Marine / Gogledd Môn Forol SAC;
- Lambay Island SAC;

~~• Carnsore Point SAC~~

- Hook Head SAC;
- North Channel SAC;
- Bristol Channel Approaches / Dynesfeydd Môr Hafren SAC;

~~• North Channel SAC~~

- ~~Roaring~~Roaringwater Bay and Islands SAC;

~~• Blasket Island SAC~~

- Kenmare River SAC;

~~• Transboundary sites with Mainland Europe (listed in Section 6.4.24)~~

- Blasket Island SAC;
- Belgica Mound Province SAC;
- Bunduff Lough and Machair / Trawalua / Mullaghmore SAC;
- Inishmore Island SAC;
- Kilkieran Bay and Islands SAC;
- West Connacht Coast SAC
  ; and
- Transboundary sites with Mainland Europe (listed in Section 6.4.24).

TIER 1 PROJECTS

7.4.2.25 ~~7.5.2.5 The highest number of harbour porpoises predicted to be disturbed~~ Across Tier 1 projects, the highest predicted level of in-combination harbour porpoise predicted to be disturbed between 2021 and 2034 is in ~~2028~~2027, which coincides with the expected ~~pile driving campaign~~construction period of the Proposed Development. Under a highly precautionary assumption that all other potential high-noise construction activities, including piling and UXO clearance, occur concurrently, the maximum ~~cumulative~~in-combination number of harbour porpoise predicted to be disturbed in ~~2028 is estimated as 3,380~~2027 is 3,930 animals ~~(5.41~~, representing 6.29% of the Irish and Celtic Sea MU population~~)~~ of 62,517 individuals (Table 7.6: Number of harbour porpoise disturbed by underwater noise in the in-combination assessment.. The number of harbour porpoise predicted to be impacted by the Proposed Development represents ~~100~~48.55% of ~~this~~the total~~. As a result~~, with the remaining predicted in-combination ~~impact is considered to be equal to that of the alone assessment and as per conclusions within the alone assessment, it is concluded there will be no AEoI, from the Proposed Development in-combination with Tier 1 Projects, upon the integrity of any of the following designated sites, as defined by the COs of the site, as a result of disturbance from underwater noise impacting harbour porpoise from Project Design Option 1.~~disturbance attributable to other concurrent activities and projects within the MU.

~~7.5.2.6 Based on the increased risk of in-combination effects of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.~~

~~TIER 1 AND 2 PROJECTS~~

7.4.2.26 iPCoD modelling undertaken for the Phase One projects (ABWP2, NISA, Dublin Array, Codling Wind Park, Oriel) indicates that, under both piling scenarios, predicted disturbance levels are insufficient to result in population-level effects, with the impacted population remaining on a stable trajectory at 99.6-99.7% of the un-impacted population size (NIS Volume III, Appendix 11.3: Phase 1 Irish Offshore Wind Farms: Cumulative iPCoD Modelling).

7.4.2.27 Taking account of the conclusions of the assessment alone for the harbour porpoise QI of Blackwater Bank SAC (the closest designated site of relevance to the Proposed Development; see Section 6.4.1), the in-combination effects are considered to affect a small proportion of the MU population, albeit at an increased proportion relative to the project alone assessment. While temporary behavioural changes or redistribution across multiple projects and years could result in minor, short-term reductions in reproductive output for some individuals, these effects are not expected to influence the population trajectory.

7.4.2.28 In relation to the COs for Irish, UK and transboundary sites for harbour porpoise (Table 5.1), the potential effects of underwater noise associated with construction on harbour porpoise have been assessed with reference to the CO for the QI across sites. For Irish sites, this is to maintain the species' favourable conservation condition, which is defined by the following attributes and targets: ensuring that human activities do not occur at levels that can affect the community at the site (through disturbance, injury or mortality), or restriction on access to or usage of the site. For UK sites, this is to maintain integrity of the site and FCS of the species, by ensuring the species is a viable component of the site, there is no significant disturbance, and the condition of supporting habitats and processes, and the availability of prey is maintained. For more detail, and the approach to sites for which no COs are outlined see the site-specific assessments (Bunduff Lough and Machair SAC (Section 6.4.13) and mainland European transboundary sites (Section 6.4.24)).

7.4.2.29 While underwater noise generated from high-noise activities during construction may result in temporary displacement of harbour porpoise, any behavioural response is expected to be limited to the period of noise generation, with individuals returning to affected areas within one to two days (Brandt *et al.*, 2016). It is noted that, due to the in-combination nature of construction across

multiple projects, noise from other projects in close proximity to an SAC may lead to an increase in the timeframe over which animals may return. However, the iPCoD modelling demonstrates that even with cumulative noise disturbance occurring across the five Phase One offshore wind projects in close proximity, the effects on the harbour porpoise population are insufficient to result in a population-level effect. All other Tier 1 projects are located at significant distance from the Phase Ones (e.g. offshore wind farms in Welsh or English waters) or will affect a very small number of animals (i.e. Greenlink Interconnector), therefore these additional projects are not expected to measurably increase in-combination effects on any given SAC with a harbour porpoise QI. Therefore, the community at any SAC within the MU is not expected to be significantly affected by in-combination construction activities. Furthermore, due to the temporary nature of the disturbance response, this will not comprise a permanent effect on the access or usage of the site, with harbour porpoise expected to return following the cessation of high-noise construction activities.

7.4.2.30 ~~7.5.2.7 The highest number of harbour porpoises predicted to be disturbed across Tier 1 and 2 projects between 2021 and 2034 is in 2028, which coincides with the expected pile driving campaign of the Proposed Development. The maximum cumulative number of harbour porpoise predicted to be disturbed in 2028 is estimated as 4,496 animals (7.19% of MU population), assuming piling on the same day as the Proposed Development at Awel y Môr offshore windfarm and Holyhead Deep tidal energy project. The number of harbour porpoises predicted to be impacted by the Proposed Development represents 75% of this total. With consideration of the conclusions in within the assessment alone, in that impacts are recoverable, short-term and only impact a small proportion of the population~~**Given the highly precautionary nature of the assessment, and the absence of predicted population-level effects or restrictions on site usage, it is concluded that there will be no AEoI~~**,**~~ **from the Proposed Development in-combination with Tier 1 ~~and 2~~ Projects~~, upon the integrity of~~ on any of the ~~above~~listed designated sites, as defined by ~~the~~their COs ~~of the site~~, as a result of disturbance from underwater noise ~~impacting~~to the harbour porpoise ~~from~~QI for Project Design Option 1.**

7.4.2.31 ~~7.5.2.8~~ **Based on the ~~increased~~representative risk of in-combination effects of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

TIER 1~~,~~ AND 2 ~~AND 3~~ PROJECTS

7.4.2.32 The assessment of Tier 1 and 2 projects is considered to be the most realistic as this includes projects that have been applied for. This means that full environmental impact assessments are available and there is reasonable confidence in the timelines of project construction.

7.4.2.33 ~~7.5.2.9 The highest number of harbour porpoises predicted to be disturbed~~ Across Tier 1~~,~~ and 2~~, and 3~~ projects, the highest predicted level of in-combination harbour porpoise disturbance between 2021 and 2034 is in ~~2028~~2027, which coincides with the expected ~~pile driving campaign~~construction period of the Proposed Development. Under a highly precautionary assumption that all other potential high-noise construction activities, including piling and UXO clearance, occur concurrently, the maximum ~~cumulative~~in-combination number of harbour porpoise predicted to be disturbed in ~~2028 is estimated as 6,865~~2027 is 4,602 animals ~~(10.98~~, representing 7.36% of the MU population~~), assuming four offshore windfarms are piling, two cable projects are constructing, and two seismic surveys occur on the same day as piling at the Proposed Development.~~ (Table 7.6: Number of harbour porpoise disturbed by underwater noise in the in-combination assessment.. The number of harbour porpoises predicted to be impacted by the Proposed Development represents ~~49~~41.46% of ~~this~~the total~~.~~, with ~~consideration~~ the remaining predicted in-combination disturbance attributable to other concurrent activities and projects within the MU.

7.4.2.34 Taking account of the conclusions ~~in within~~of the assessment alone~~, it is concluded that~~ for the harbour porpoise QI of Blackwater Bank SAC (the closest designated site of relevance to the

Proposed Development; see Section 6.4.1), the in-combination ~~impacts are also recoverable, short-term, unlikely to impact any of the COs and only impact~~effects are considered to affect only a small proportion of the MU population ~~though an increase proportion. However, as the overall disturbance effect is predicted occur~~, albeit at an increased proportion relative to the alone assessment. While temporary behavioural changes or redistribution across multiple projects ~~over several years, the temporary changes in behaviour and/or distribution of individuals~~and years could result in ~~potential~~minor, short-term reductions in reproductive ~~rates of~~output for some individuals, ~~although is unlikely to affect~~these effects are not expected to influence the population trajectory. ~~It is should also be noted that this assessment is highly precautionary and is the worst case scenario assessment, many of the projects considered within Tier 3 are not consented and so there is little confidence on if they will have an impact due to the uncertainty that they will go ahead. With this in consideration~~

7.4.2.35 In relation to the COs for Irish, UK and transboundary sites for harbour porpoise (Table 5.1), the potential effects of underwater noise associated with construction on harbour porpoise have been assessed with reference to the CO for the QI across sites. For Irish sites, this is to maintain the species' favourable conservation condition, which is defined by the following attributes and targets: ensuring that human activities do not occur at levels that can affect the community at the site (through disturbance, injury or mortality), or restriction on access to or usage of the site. For UK sites, this is to maintain integrity of the site and FCS of the species, by ensuring the species is a viable component of the site, there is no significant disturbance, and the condition of supporting habitats and processes, and the availability of prey is maintained. For more detail, and the approach to sites for which no COs are outlined see the site-specific assessments (Bunduff Lough and Machair SAC (Section 6.4.13) and mainland European transboundary sites (Section 6.4.24)).

7.4.2.36 While underwater noise generated from high-noise activities during construction may result in temporary displacement of harbour porpoise, any behavioural response is expected to be limited to the period of noise generation, with individuals returning to affected areas within one to two days (Brandt *et al.*, 2016). It is noted that, due to the in-combination nature of construction across multiple projects, noise from other projects in close proximity to an SAC may lead to an increase in the timeframe over which animals may return. However, the iPCoD modelling demonstrates that even with cumulative noise disturbance occurring across up to five offshore wind projects in close proximity, the in-combination effects on the harbour porpoise population are insufficient to result in a population-level effect. All other Tier 1 and 2 projects are located at significant distance from the Phase Ones (e.g. offshore wind farms in Welsh or English waters) or will affect a very small number of animals (e.g. interconnectors or tidal devices), therefore these additional projects are not expected to measurably increase in-combination effects on any given SAC with a harbour porpoise QI. Therefore, the community at any SAC within the MU is not expected to be significantly affected by in-combination construction activities. Furthermore, due to the temporary nature of the disturbance response, this will not comprise a permanent effect on the access or usage of the site, with harbour porpoise expected to return following the cessation of high-noise construction activities.

7.4.2.37 **Given the highly precautionary nature of the assessment, and the absence of predicted population-level effects or restrictions on site usage, it is concluded that there will be no AEoI~~,~~ from the Proposed Development in-combination with Tier 1~~,~~ and 2 ~~and 3~~ Projects~~,~~ ~~upon the integrity of~~ on any of the ~~above~~listed designated sites, as defined by ~~the~~their COs ~~of the site~~, as a result of disturbance from underwater noise impacting to the harbour porpoise ~~from~~QI for Project Design Option 1.**

7.4.2.38 ~~7.5.2.10~~ **Based on the ~~increased~~representative risk of in-combination effects of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

TIER 1, 2~~,~~ AND 3 ~~AND PHASE 1~~ PROJECTS

~~7.5.2.11 For projects with higher data confidence (Tier 1 and 2), the cumulative number of harbour porpoise predicted to be disturbed is low (≤ 1% of the MU population) across the majority of years in the period under consideration (2021 – 2034), with higher numbers between 2026 and 2030 (≥7.19% of the MU population). The average proportion of the population potentially disturbed by Tier 1 and 2 projects between all years considered in this in-combination assessment (2021 to 2034) is 1.21% of the MU population.~~

7.4.2.39 The assessment of Tier 3 projects is subject to a high degree of uncertainty as these projects are not yet consented and may not proceed. As such, Tier 3 projects are considered less likely to contribute to an in-combination effects, and the results of this assessment are associated with low confidence.

7.4.2.40 ~~7.5.2.12~~ Across ~~all Tiers and Phase~~Tier 1, 2 and 3 projects, the highest ~~impact is~~ predicted ~~to occur~~level of in-combination harbour porpoise disturbance between 2021 and 2034 is in 2028, which coincides with the expected ~~pile driving campaign~~construction period of the Proposed Development. Under a highly precautionary assumption that all other potential high-noise construction activities, including piling and UXO clearance, occur concurrently, the maximum ~~cumulative~~in-combination number of harbour porpoise predicted to be disturbed in 2028 is ~~estimated as 8,250~~6,539 animals ~~(13.20~~, representing 10.46% of the MU population~~) assuming five offshore windfarms are piling, high order UXO clearance at one offshore windfarm, one tidal project and two cable projects are constructing, and two seismic surveys occur on the same day as piling at the Proposed Development.~~ (Table 7.6: Number of harbour porpoise disturbed by underwater noise in the in-combination assessment.. The number of harbour porpoises predicted to be impacted by the Proposed Development represents ~~41~~29.18% of ~~this~~the total, indicating that the majority of predicted in-combination disturbance arises from other concurrent activities and projects within the MU.

7.4.2.41 When considering only projects with higher data confidence (Tier 1 and 2), predicted in-combination disturbance remains low throughout the assessment period (2021 – 2034). The highest predicted levels of disturbance for Tier 1 and Tier 2 projects occur between 2025 and 2034, peaking in 2027 at approximately 7.36% of the MU population (Table 7.6). Outside this peak construction window, disturbance levels are lower, with an average of 3.37% of the MU population predicted to be disturbed across all years considered in this in-combination assessment (2021 to 2034).

7.4.2.42 ~~7.5.2.13~~ However, it is important to recognise that the likelihood of all Tier 1, 2, and 3 ~~and Phase 1~~ projects undertaking ~~noisy~~high-noise construction related activities at the same time is extremely unlikely. ~~The highest predicted impact occurs in 2028 when five~~In 2028, this scenario assumes concurrent construction of 11 offshore windfarms ~~are assumed to be piling, high order UXO clearance at~~and two power cable projects, decommissioning of one offshore windfarm, ~~one tidal project and two cable projects are constructing, and~~ two seismic surveys ~~occur as well as pile driving~~, and piling at the Proposed Development~~. Logistically, this is improbable due to the number of vessels, particularly for piling, that are currently available for such works.~~ (Table 7.6). Given logistical constraints, particularly the limited availability of piling vessels, simultaneous execution of all these activities is considered improbable. As such, predicted peak levels of disturbance should be interpreted as conservative upper bounds rather than realistic expectations.

7.4.2.43 ~~7.5.2.14 There is also~~Further precaution ~~surrounding the estimated number of harbour porpoise predicted to experience behavioural disturbance from seismic surveys. Large~~is associated with the assessment of seismic survey impacts. While large-scale 2D and 3D seismic surveys used in oil and gas exploration ~~can produce~~may generate large impact ranges (~~12~~up to 10 km EDR for harbour porpoise~~)~~; JNCC, 2025), evidence indicates that behavioural responses are short-term. Thompson *et al.* (~~2013) show that the disturbance impact is short-lived as~~2013b) demonstrated

that harbour porpoise ~~have been shown to~~typically return to ~~the impacted area~~affected areas within approximately 19 hours following the cessation of survey activity. ~~This change in behaviour is therefore~~Accordingly, behavioural disturbance from seismic surveys is considered ~~to be short-term and~~ recoverable and unlikely to result in long-term displacement or population-level effects.

7.4.2.44 Although insufficient information on piling schedules across the Tier 3 projects precludes detailed population-level modelling, previous theoretical studies provide relevant context. For example, the Disturbance Effects of Noise on the Harbour Porpoise Population in the North Sea (DEPONS) modelling undertaken by Nabe-Nielsen *et al.* (2018) indicated that the North Sea harbour porpoise population was unlikely to experience significant long-term impacts from construction of 60 offshore windfarms (each comprising 65 turbines), despite up to 3,900 days of disturbance (between 2011 and 2020) and a temporary population decline of up 20%. Recovery to baseline population size was predicted within six to seven years. This scenario far exceeds the scale and duration of disturbance predicted in this in-combination assessment, indicating that any potential population decline or population-level effects here would be smaller and with a quicker recovery to baseline.

7.4.2.45 ~~7.5.2.15 Overall, the predicted extent of the cumulative disturbance is to~~Taking account of the conclusions for the assessment alone for the harbour porpoise QI Blackwater Bank SAC ((the closest designated site of relevance to the Proposed Development; see Section 6.4.1), the in-combination effects are considered to affect only a small proportion of the MU population, ~~with short-term~~albeit at an increased proportion relative to the alone assessment. While temporary behavioural changes ~~expected from each disturbance event. With consideration of this being carried out~~or redistribution across multiple projects and ~~multiple~~ years~~, this~~ could result in ~~temporary changes in behaviour, distribution and a possible reduction~~minor, short-term reductions in reproductive ~~rates for the small proportion impacted. With consideration of the proportion of~~output for some individuals ~~impacted however, this is unlikely to affect the natural~~, these effects are not expected to influence the population trajectory. ~~The COs for the various designated sites are focused on maintaining the FCS of the species, ensuring the protected sites still function and are a protected area for the species, with the reference population being use being the MUs population. With consideration of the conclusions within the alone~~

7.4.2.46 In relation to the COs for Irish, UK and transboundary sites for harbour porpoise (Table 5.1), the potential effects of underwater noise associated with construction on harbour porpoise have been assessed with reference to the CO for the QI across sites. For Irish sites, this is to maintain the species' favourable conservation condition, which is defined by the following attributes and targets: ensuring that human activities do not occur at levels that can affect the community at the site (through disturbance, injury or mortality), or restriction on access to or usage of the site. For UK sites, this is to maintain integrity of the site and FCS of the species, by ensuring the species is a viable component of the site, there is no significant disturbance, and the condition of supporting habitats and processes, and the availability of prey is maintained. For more detail, and the approach to sites for which no COs are outlined see the site-specific assessments (Bunduff Lough and Machair SAC (Section 6.4.13) and mainland European transboundary sites (Section 6.4.24)).

7.4.2.47 While underwater noise generated from high-noise activities during construction may result in temporary displacement of harbour porpoise, any behavioural response is expected to be limited to the period of noise generation, with individuals returning to affected areas within one to two days (Brandt *et al.*, 2016). It is noted that, due to the in-combination nature of construction across multiple projects, noise from other projects in close proximity to an SAC may lead to an increase in the timeframe over which animals may return. However, the iPCoD modelling demonstrates that even with cumulative noise disturbance occurring across up to five offshore wind projects in close proximity, the in-combination effects on the harbour porpoise population are insufficient to result in a population-level effect. All other Tier 1 or 2 projects are located at significant distance from the Phase Ones (e.g. offshore wind farms in Welsh or English waters) or will affect a very

small number of animals (e.g. interconnectors or tidal devices), therefore these additional projects are not expected to measurably increase in-combination effects on any given SAC with a harbour porpoise QI. The potential for the Tier 3 projects to contribute to in-combination disturbance on any SAC, in addition to the Proposed Development, is of lower likelihood. Therefore, the community at any SAC within the MU is not expected to be significantly affected by in-combination construction activities. Furthermore, due to the temporary nature of the disturbance response, this will not comprise a permanent effect on the access or usage of the site, with harbour porpoise expected to return following the cessation of high-noise construction activities.

7.4.2.48 **Given the highly precautionary nature of the assessment, and ~~above in-combination conclusions~~the absence of predicted population-level effects or restrictions on site usage, it is concluded that ~~the increase to in-combination disturbance will not result in an~~there will be no AEoI~~,~~ from the Proposed Development in-combination with Tier 1, 2~~,~~ and 3~~, and Phase 1~~ Projects~~, upon the integrity of~~ on any of the ~~above~~listed designated sites, as defined by ~~the~~their COs ~~of the site~~, as a result of disturbance from underwater noise ~~impacting~~to the harbour porpoise ~~from~~QI for Project Design Option 1.**

7.4.2.49 ~~7.5.2.16~~ **Based on the ~~increased~~representative risk of in-combination effects of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

Table 7.6: Number of harbour porpoise disturbed by underwater noise in the in-combination assessment.

The Proposed Development construction window is indicated by red bars. Orange = Not yet/no longer operational; Grey = Abandoned/not in use; Blue = Construction; Pale blue = Decommissioning; Navy = Operation and maintenance

Project	Tier	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Proposed Development	1							1,908	1,908	1,908	1,908				
Codling Wind Park	1						353	353	353	353					
Dublin Array	1									353	353	353	353		
NISA	1							353	353	353	353				
Oriel	1								353	353	353				
Greenlink Interconnector	1				2	2	2								
Erebus Floating Wind Demo	1			20	20	20	20								
Awel y Môr	1			648	648	648	648	648							
Morgan	1					648	648	648	648						
North Hoyle	1											648	648	648	648
White Cross	1					20	20	20							
Burbo Bank	1											648	648	648	648
Walney 1	1											648	648	648	648
TwinHub	1				20	20	20								
Holyhead Deep	2						23	23							
West Anglesey Demonstration Zone	2		23	23	23	23	23								
Mona	2					648	648	648	648						
Celtic Interconnector	2				1	1	1	1							
ABWP 1	3							353	353	353	353				
Mares Connect	3						23	23	23						
Rosslare ORE Hub	3							23	23						
Port of Waterford ORE	3						3	3	3						

Pembrokeshire Demonstration Zone	3					2	2								
Erebus/Valorous Potential Cable Route	3						2	2	2						
Llyr 1	3							20	20	20					
Llyr 2	3							20	20	20					
Morecambe	3							648	648	648	648				
Mooir Vannin	3								353	353	353	353			
North Channel Wind 2	3								353	353	353	353			
LirlC	3						23	23	23	23					
North Channel Wind 1	3								353	353	353	353			
Seismic survey 1	3	51	51	51	51	51	51	51	51	51	51	51	51	51	51
Seismic survey 2	3	51	51	51	51	51	51	51	51	51	51	51	51	51	51
Tier 1		0	0	668	690	1,358	1,711	3,930	3,615	3,320	2,967	2,297	2,297	1,944	1,944
% MU[1]		0.00 %	0.00 %	1.07 %	1.10 %	2.17 %	2.74 %	6.29 %	5.78%	5.31 %	4.75 %	3.67 %	3.67 %	3.11 %	3.11 %
Tier 1 and 2		0	23	691	714	2,030	2,406	4,602	4,263	3,320	2,967	2,297	2,297	1,944	1,944
% MU[1]		0.00 %	0.04 %	1.11 %	1.14 %	3.25 %	3.85 %	7.36 %	6.82%	5.31 %	4.75 %	3.67 %	3.67 %	3.11 %	3.11 %
Tier 1, 2 and 3		102	125	793	816	2,134	2,561	5,819	6,539	5,545	5,129	3,458	2,399	2,046	2,046
% MU[1]		0.16 %	0.20 %	1.27 %	1.31 %	3.41 %	4.10 %	9.31 %	10.46 %	8.87 %	8.20 %	5.53 %	3.84 %	3.27 %	3.27 %

[1]Reference population represents the Celtic and Irish Sea MU population of 62,517 individuals (IAMMWG, 2023).

DISTURBANCE FROM UNDERWATER NOISE ON HARBOUR SEAL ~~– PILING ACTIVITIES~~

7.4.2.50 ~~7.5.2.17~~ The following are the designated sites for harbour seal considered within this in-combination assessment:

- Slaney River Valley SAC.

TIER 1 PROJECTS

~~7.5.2.18 The highest number of harbour seals predicted to be disturbed across Tier 1 projects between 2021 and 2034 is in 2022, 2023, 2024, 2025, and 2026. This is predicted to occur within the construction period of the Proposed Development (2026 – 2030), although for the purposes of the assessment the number of animals disturbed has been calculated assuming that UXO clearance will occur in 2027 and piling in 2028. Therefore, the highest number of harbour seals is predicted to occur in the absence of the Proposed Development.~~

7.4.2.51 Across Tier 1 projects, the highest predicted level of in-combination harbour seal disturbance between 2021 and 2034 is in 2029, which coincides with the expected construction period of the Proposed Development. Under a highly precautionary assumption that all other potential high-noise construction activities, including piling and UXO clearance, occur concurrently, the maximum in-combination number of harbour seal predicted to be disturbed in 2029 is 157 animals, representing 86.26% of the East region of RoI population of 182 individuals, and 11.39% of the combined population of 1,378 individuals from across the East and South-east RoI, Wales MU, and Northern Ireland MU for harbour seals (Table 7.7). The number of harbour seals predicted to be impacted by the Proposed Development represents 0.64% of the total, indicating that the majority of predicted in-combination disturbance arises from other concurrent activities and projects within the East RoI region.

7.4.2.52 iPCoD modelling results indicates that the level of disturbance predicted under both piling are insufficient to result in any population-level effects, with the impacted population remaining on a stable trajectory at the same size as the un-impacted population (NIS Volume III, Appendix 11.3: Phase 1 Irish Offshore Wind Farms: Cumulative iPCoD Modelling).

7.4.2.53 Taking account of the appropriate larger population size for the in-combination assessment, the conclusions of the assessment alone for the harbour seal QI of the Slaney River SAC (the closest designated site of relevance to the Proposed Development; see Section 6.4.2), the in-combination effects are considered to affect a small proportion of the population, albeit at an increased proportion relative to the alone assessment. While temporary behavioural changes or redistribution across multiple projects and years could result in minor, short-term reductions in reproductive output for some individuals, these effects are not expected to influence the population trajectory.

7.4.2.54 In relation to the site-specific COs for Slaney River Valley SAC (Table 5.1), the potential effects of underwater noise associated with construction on harbour seal have been assessed with reference to the CO for the QI for the site; to maintain the favourable conservation condition, which is defined by the following attributes and targets: ensuring that human activities do not occur at levels that can affect the population at the site (through disturbance, injury or mortality), or restriction on access to or usage of the site. Coastal or terrestrial habitats used for breeding, moulting or resting will not be impacted by underwater noise.

7.4.2.55 While underwater noise generated from high-noise activities during construction may result in temporary displacement of harbour seal, any behavioural response is expected to be limited to the period of noise generation, with individuals returning to affected areas within two hours (Russell *et al.,* 2016). It is noted that, due to the in-combination nature of construction across multiple projects, noise from other projects in close proximity to the SAC may lead to an increase in the timeframe over which animals may return. However, the iPCoD modelling demonstrates

that even with in-combination noise disturbance occurring across the five Phase One offshore wind projects in close proximity, the in-combination effects on the harbour seal population are insufficient to result in a population-level effect (noting this comprises all the Tier 1 projects). Therefore, the population at the SAC is not expected to be significantly affected by in-combination construction activities. Furthermore, due to the temporary nature of the disturbance response, this will not comprise a permanent effect on the access or usage of the site, with harbour seals expected to return following the cessation of high-noise construction activities.

7.4.2.56 ~~7.5.2.19 The maximum cumulative number of harbour seal predicted to be disturbed is estimated as 23 animals (12.64% of the MU population). With consideration that the alone assessment concluded up to 1 harbour seal will be disturbed by this development~~**Given the highly precautionary nature of the assessment, and the absence of predicted population-level effects or restrictions on site usage, it is concluded that there will be no AEoI~~~~,~~ **from the Proposed Development in-combination with Tier 1 Projects~~, upon the integrity of any of the above designated sites~~ on the Slaney River Valley SAC, as defined by ~~the~~its COs ~~of the site~~, as a result of disturbance from underwater noise ~~impacting~~to the harbour seal ~~from~~QI for Project Design Option 1.**

7.4.2.57 ~~7.5.2.20~~ **Based on the ~~increased~~representative risk of in-combination effects of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

TIER 1 AND 2 PROJECTS

7.4.2.58 Across Tier 1 and 2 projects, the predicted level of in-combination harbour seal disturbance is unchanged from the Tier 1 assessment. This reflects the fact that there are no Tier 2 projects located within the East region of RoI for harbour seals. Therefore, under a highly precautionary assumption that all other potential high-noise construction activities, including piling and UXO clearance, occur concurrently, the maximum in-combination number of harbour seals predicted to be disturbed in 2029 remains as 157 animals, representing 86.26% of the East region of RoI population, and 11.39% of the combined population across the East and South-east RoI, Wales MU, and Northern Ireland MU for harbour seals (Table 7.7).

7.4.2.59 Taking account of the appropriate larger population size for the in-combination assessment, the conclusions of the assessment alone for the harbour seal QI of Slaney River SAC (the closest designated site of relevance to the Proposed Development; see Section 6.4.2), the conclusions presented for Tier 1 projects apply equally to the Tier 1 and Tier 2 scenario. In-combination effects are therefore considered to affect a small proportion of the population, albeit at an increased proportion relative to the alone assessment. While temporary behavioural changes or redistribution across multiple projects and years could result in minor, short-term reductions in reproductive output for some individuals, these effects are not expected to influence the population trajectory.

7.4.2.60 In relation to the site-specific COs for Slaney River Valley SAC (Table 5.1), the potential effects of underwater noise associated with construction on harbour seal have been assessed with reference to the CO for QI at the site; to maintain the species' favourable conservation condition, which is defined by the following attributes and targets: ensuring that human activities do not occur at levels that can affect the population at the site (through disturbance, injury or mortality), or restriction on access to or usage of the site. Coastal or terrestrial habitats used for breeding, moulting or resting will not be impacted by underwater noise.

7.4.2.61 While underwater noise generated from high-noise activities during construction may result in temporary displacement of harbour seal, any behavioural response is expected to be limited to the period of noise generation, with individuals returning to affected areas within two hours (Russell *et al.,* 2016). It is noted that, due to the in-combination nature of construction across multiple projects, noise from other projects in close proximity to the SAC may lead to an increase in the timeframe over which animals may return. However, the iPCoD modelling demonstrates

that even with in-combination noise disturbance occurring across the five Phase One offshore wind projects in close proximity, the in-combination effects on the harbour seal population are insufficient to result in a population-level effect. Therefore, the population at the SAC is not expected to be significantly affected by in-combination construction activities. Furthermore, due to the temporary nature of the disturbance response, this will not comprise a permanent effect on the access or usage of the site, with harbour seals expected to return following the cessation of high-noise construction activities.

~~7.5.2.21 No Tier 2 projects were included in this part of the cumulative assessment for harbour seals, as none are within their respective MU. Therefore, there are no changes from the Tier 1 conclusions for this in-combination assessment.~~

~~TIER 1 AND 3 PROJECTS~~

~~7.5.2.22 The highest number of harbour seals predicted to be disturbed across Tier 1, 2, and 3 projects between 2021 and 2034 is in 2024, 2025, and 2026. For the purposes of the assessment the number of animals disturbed has been calculated assuming that UXO clearance will occur in 2027 and piling in 2028, therefore, the highest number of seals is predicted to occur in the absence of the Proposed Development.~~

~~7.5.2.23 The maximum cumulative number of harbour seals predicted to be disturbed is estimated as 46 animals (25.27% of the MU population), assuming two cable projects are constructing.~~

7.4.2.62 ~~7.5.2.24 When the Proposed Development is expected to be piling in 2028, the maximum cumulative number of harbour seals predicted to be disturbed is estimated as up to one animal (0.55% of the MU population). With consideration that the alone assessment concluded up to 1 harbour seal will be disturbed by this development~~**Given the highly precautionary nature of the assessment, and the absence of predicted population-level effects or restrictions on site usage, it is concluded that there will be no AEoI~~~~,~~ **from the Proposed Development in-combination with Tier 1 and ~~3~~2 Projects~~, upon the integrity of any of the above designated sites~~ on the Slaney River Valley SAC, as defined by ~~the~~its COs ~~of the site~~, as a result of disturbance from underwater noise ~~impacting~~to the harbour seal ~~from~~QI for Project Design Option 1.**

7.4.2.63 ~~7.5.2.25~~ **Based on the ~~increased~~representative risk of in-combination effects of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

TIER 1, 2 AND 3 ~~AND PHASE 1~~ PROJECTS

7.4.2.64 Across Tier 1, 2 and 3 projects, the highest predicted level of in-combination harbour seal disturbance between 2021 and 2034 is in 2029, which coincides with the expected construction period of the Proposed Development. Under a highly precautionary assumption that all other potential high-noise construction activities, including piling and UXO clearance, occur concurrently, the maximum in-combination number of harbour seals predicted to be disturbed in 2029 is 196 animals, representing 107.69% of the East region of RoI population of 182 animals, or 14.22% of the combined population of 1,378 animals across the East and South-east RoI, Wales MU, and Northern Ireland MU for harbour seals (Table 7.7). The number of harbour seals predicted to be impacted by the Proposed Development represents 0.83% of the total, indicating that the majority of predicted in-combination disturbance arises from other concurrent activities and projects within the wider region.

7.4.2.65 ~~7.5.2.26 For~~When considering only projects with higher data confidence (Tier 1 and 2), ~~the cumulative number of harbour seals predicted to be disturbed is very low (0% of the MU population) across the majority of years in the period under consideration (2021 – 2034), with higher numbers from 2022 to 2026 (12.64% of the MU population). The average proportion of the population potentially disturbed by Tier 1 and 2 projects between~~ predicted in-combination

disturbance of harbour seals remains limited throughout the assessment period (2021 – 2034). The highest predicted levels of disturbance for Tier 1 and Tier 2 projects occur during the Phase One offshore windfarm construction window between 2026 and 2032, peaking in 2029 at approximately 11.39% of the combined population size of 1,378 animals is assumed (Table 7.7). Outside this peak construction window, predicted levels of disturbance are lower, with an average of 3.05% of the combined reference population predicted to be disturbed across all years considered in this in-combination assessment (2021 to 2034) ~~is 4.59% of the MU population.~~

7.4.2.66 Taking account of the appropriate larger population size for the in-combination assessment and the conclusions of the assessment alone for the harbour seal QI of Slaney River SAC (the closest designated site of relevance to the Proposed Development; see Section 6.4.2), the in-combination effects are considered to affect a small proportion of the population, albeit at an increased proportion relative to the alone assessment. While temporary behavioural changes or redistribution across multiple projects and years could result in minor, short-term reductions in reproductive output for some individuals, these effects are not expected to influence the population trajectory.

7.4.2.67 In relation to the site-specific COs for Slaney River Valley SAC (Table 5.1), the potential effects of underwater noise associated with construction on harbour seal have been assessed with reference to the CO for the QI; to maintain the favourable conservation condition, which is defined by the following attributes and targets: ensuring that human activities do not occur at levels that can affect the population at the site (through disturbance, injury or mortality), or restriction on access to or usage of the site. Coastal or terrestrial habitats used for breeding, moulting or resting will not be impacted by underwater noise.

7.4.2.68 While underwater noise generated from high-noise activities during construction may result in temporary displacement of harbour seal, any behavioural response is expected to be limited to the period of noise generation, with individuals returning to affected areas within two hours (Russell *et al.,* 2016). It is noted that, due to the in-combination nature of construction across multiple projects, noise from other projects in close proximity to the SAC may lead to an increase in the timeframe over which animals may return. However, the iPCoD modelling demonstrates that even with in-combination noise disturbance occurring across the five Phase One offshore wind projects in close proximity, the in-combination effects on the harbour seal population are insufficient to result in a population-level effect. Furthermore, the potential for the Tier 3 project to contribute to in-combination disturbance on the SAC, in addition to the Proposed Development, is of lower likelihood. Therefore, the population at the SAC is not expected to be significantly affected by in-combination construction activities. Furthermore, due to the temporary nature of the disturbance response, this will not comprise a permanent effect on the access or usage of the site, with harbour seals expected to return following the cessation of high-noise construction activities.

~~7.5.2.27 The highest number of harbour seals predicted to be disturbed across Tier 1, 2, 3, and Phase 1 projects between 2021 and 2034 is in 2027, which coincides with the assumed UXO clearance campaign of the Proposed Development. The maximum cumulative number of harbour seals predicted to be disturbed in 2027 is estimated as 694 animals (381.32% of the MU population) assuming two offshore windfarms are piling, two offshore windfarms are undertaking UXO clearance, and one cable project is constructing on the same day as the Proposed Development. The number of harbour seals predicted to be impacted by the Proposed Development represents <1% of this total.~~

~~7.5.2.28 When the Proposed Development is expected to be piling in 2028, the maximum cumulative number of harbour seals predicted to be disturbed is estimated as 304 animals (167.03% of the MU population), assuming one offshore windfarm is piling, and one is undertaking UXO clearance on the same day as piling at the Proposed Development. The number of harbour seals predicted to be impacted by the Proposed Development represents <1% of this total.~~

~~7.5.2.29 The number of animals available in the area that could be disturbed are being over-predicted as it exceeds the MU population size of 182 animals within the East region of Ireland. Considering the typical foraging distances of seals (Carter *et al.*, 2022), it is possible that seals from the East and South-east survey regions of the Ireland presented in Morris and Duck (2019), and from the Wales and Northern Ireland Management Units (SCOS, 2022), could also be disturbed by construction activities at projects screened into this assessment, including the Proposed Development. Therefore, for the purposes of the in-combination assessment it is more appropriate to consider the population of the East and South-east Ireland, Wales MU, and Northern Ireland MU for harbour seal as 1,378 animals. If the population size is assumed to be 1,378 animals, the percentage of the population predicted to be disturbed in 2028 reduces to 22.06%.~~

~~7.5.2.30 Given the residency of harbour seals and their limited home ranges, it is possible that the same individuals could experience sufficient days of repeated disturbance to impact vital rates, potentially to a sufficient proportion of the population to result in changes in the population trajectory. To investigate the impact of disturbance on harbour seals, iPCoD modelling was used on two different piling scenarios. The modelling results showed that the level of disturbance predicted is not sufficient to result in any changes at the population level, since the impacted population is predicted to continue at a stable trajectory at 100% of the size of the un-impacted population.~~

~~7.5.2.31 It is important to note that there are numerous precautions and assumptions made within this assessment relating to the MU population size, EDR approach, and inclusion of Tier 3 projects which result in an assessment with limited confidence which should be interpreted with a high level of precaution. Overall, the predicted extent of the cumulative disturbance is to a relatively small proportion of the MU population (assuming the population includes the East and South-east regions of Ireland, Wales, and Northern Ireland) with short-term behavioural changes expected from each disturbance event that an individual is exposed to. However, as the overall disturbance effect is predicted to occur across multiple projects and over several years, the temporary changes in behaviour and/or distribution of individuals could result in potential reductions in reproductive rates of some individuals, although is unlikely to affect the population trajectory.~~

7.4.2.69 ~~7.5.2.32 With consideration that the alone assessment concluded up to one harbour seal will be disturbed by this development~~**Given the highly precautionary nature of the assessment, and the absence of predicted population-level effects or restrictions on site usage, it is concluded that there will be no AEoI~~**,** **from the Proposed Development in-combination with Tier 1, 2, and 3 ~~and Phase 1~~ Projects~~, upon the integrity of any of the above designated sites~~ on the Slaney River Valley SAC, as defined by ~~the~~its COs ~~of the site~~, as a result of disturbance from underwater noise ~~impacting~~to the harbour seal ~~from~~QI for Project Design Option 1.**

7.4.2.70 ~~7.5.2.33~~ **Based on the ~~increased~~representative risk of in-combination effects of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

Table 7.7: Number of harbour seal disturbed by underwater noise in the in-combination assessment.

The Proposed Development construction window is indicated by red bars. Orange = Not yet/no longer operational; Grey = Abandoned/not in use; Blue = Construction; Pale blue = Decommissioning; Navy = Operation and maintenance

Project	Tier	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Proposed Development	1							1	1	1	1				
Codling Wind Park	1						39	39	39	39					
Dublin Array	1									39	39	39	39		
Oriel	1								39	39	39				
NISA	1							39	39	39	39				
Mares Connect	3						3	3	3						
ABWP 1	3							39	39	39	39				
Tier 1		0	0	0	0	0	39	79	118	157	118	39	39	0	0
% MU (alone)[1]		0.00 %	0.00 %	0.00 %	0.00 %	0.00 %	21.43 %	43.41 %	64.84 %	86.26%	64.84 %	21.43 %	21.43 %	0.00 %	0.00 %
% MU (combined)[2]		0.00 %	0.00 %	0.00 %	0.00 %	0.00 %	2.83%	5.73%	8.56%	11.39%	8.56%	2.83%	2.83%	0.00 %	0.00 %
Tier 1 and 2		0	0	0	0	0	39	79	118	157	118	39	39	0	0
% MU (alone)[1]		0.00 %	0.00 %	0.00 %	0.00 %	0.00 %	21.43 %	43.41 %	64.84 %	86.26%	64.84 %	21.43 %	21.43 %	0.00 %	0.00 %
% MU (combined)[2]		0.00 %	0.00 %	0.00 %	0.00 %	0.00 %	2.83%	5.73%	8.56%	11.39%	8.56%	2.83%	2.83%	0.00 %	0.00 %
Tier 1, 2 and 3		0	0	0	0	0	42	121	160	196	157	39	39	0	0
% MU (alone)[1]		0.00 %	0.00 %	0.00 %	0.00 %	0.00 %	23.08 %	66.48 %	87.91 %	107.69 %	86.26 %	21.43 %	21.43 %	0.00 %	0.00 %
% MU (combined)[2]		0.00 %	0.00 %	0.00 %	0.00 %	0.00 %	3.05%	8.78%	11.61 %	14.22%	11.39 %	2.83%	2.83%	0.00 %	0.00 %

[1]Reference population represents the scaled East region of RoI population of 1,82 individuals (Morris and Duck, 2019).

[2]Reference population presents the scaled combined regions of East and South-east RoI, Wales MU and Northern Ireland MU of 1,378 individuals (Morris and Duck, 2019; SCOS, 2024).

DISTURBANCE FROM UNDERWATER NOISE ON GREY SEAL ~~– PILING ACTIVITIES~~

7.4.2.71 ~~7.5.2.34~~ The following are the designated sites for grey seal considered within this in-combination assessment:

- Lambay Island SAC;

~~• Saltee Islands SAC~~

- Lleyn Peninsula and the Sarnau / Pen Llyn a'r Sarnau SAC;
- Cardigan Bay / Bae Ceredigion SAC;
- Pembrokeshire Marine / Sir Benfro Forol SAC; and
- Saltee Islands SAC.

TIER 1 PROJECTS

7.4.2.72 ~~7.5.2.35 The highest number of grey seals predicted to be disturbed~~ Across Tier 1 projects, the highest predicted level of in-combination grey seal disturbance between 2021 and 2034 is in ~~2028~~2029, which coincides with the expected ~~pile driving campaign~~construction period of the Proposed Development. Under a highly precautionary assumption that all other potential high-noise construction activities, including piling and UXO clearance, occur concurrently, the maximum ~~cumulative~~in-combination number of ~~harbour porpoise~~grey seal predicted to be disturbed in ~~2028 is estimated as 300~~2029 is 1,524 animals ~~(18.01~~, representing 91.70% of the ~~MU~~East region of RoI population of 1,662 individuals, and 15.34% of the combined population of 9,936 across the East and South-east RoI, Wales MU, and Northern Ireland MU for grey seals (Table 7.8). The number of grey seals predicted to be impacted by the Proposed Development represents ~~100~~8.66% of ~~this~~the total~~. With consideration that the alone assessment grey seal have negligible sensitivity to this kind of disturbance,~~, indicating that the majority of predicted in-combination disturbance arises from other concurrent activities and projects within the East RoI region.

7.4.2.73 iPCoD modelling results show that the level of disturbance predicted under both piling scenarios, predicted are insufficient to result in population-level effects, with the impacted population remaining on an increasing trajectory at the same size as the un-impacted population (NIS Volume III, Appendix 11.3: Phase 1 Irish Offshore Wind Farms: Cumulative iPCoD Modelling).

7.4.2.74 Taking into account the appropriate population size for the in-combination assessment, the conclusions for the assessment alone for the grey seal QI of the Lambay Island SAC (the closest designated site of relevance to the Proposed Development; see section 6.4.5), the in-combination effects are considered to affect a small proportion of the population, albeit at an increased proportion relative to the alone assessment. While temporary behavioural changes or redistribution across multiple projects and years could result in minor, short-term reductions in reproductive output for some individuals, these effects are not expected to influence the population trajectory.

7.4.2.75 In relation to the COs for the Irish and Welsh SACs with grey seal QIs (Table 5.1), the potential effects of underwater noise associated with construction on grey seal have been assessed with reference to the CO for the QI across sites. For Irish sites, this is to maintain the species' favourable conservation condition, which is defined by the following attributes and targets: ensuring that human activities do not occur at levels that can affect the population at the site (through disturbance, injury or mortality), or restriction on access to or usage of the site. Coastal or terrestrial habitats used for breeding, moulting or resting will not be impacted by underwater noise. For Welsh sites, this is to maintain integrity of the site by ensuring that the grey seal population using the SAC remains in favourable condition over the medium and long term. This requires that the population remains a viable component of the site, that seals can access and

utilise the habitats necessary to support the population, and the condition of supporting habitats and processes, and the availability of prey is maintained.

7.4.2.76 While underwater noise generated from high-noise activities during construction may result in temporary displacement of grey seal, any behavioural response is expected to be limited to the period of noise generation, with individuals returning to affected areas within two hours (Russell *et al.,* 2016). It is noted that, due to the in-combination nature of construction across multiple projects, noise from other projects in close proximity to an SAC may lead to an increase in the timeframe over which animals may return. However, the iPCoD modelling demonstrates that even with in-combination noise disturbance occurring across the five Phase One offshore wind projects in close proximity, the effects on the grey seal population are insufficient to result in a population-level effect (noting this comprises all the Tier 1 projects). Therefore, the populations in the SACs are not expected to be significantly affected by in-combination construction activities. Furthermore, due to the temporary nature of the disturbance response, this will not comprise a permanent effect on the access or usage of the site, with grey seals expected to return following the cessation of high-noise construction activities.

7.4.2.77 **Given the highly precautionary nature of the assessment, and the absence of predicted population-level effects or restrictions on site usage, it is concluded that there will be no AEoI~~,~~ from the Proposed Development in-combination with Tier 1 Projects~~, upon the integrity of~~ on any of the ~~above~~listed designated sites, as defined by ~~the~~their COs ~~of the site~~, as a result of disturbance from underwater noise ~~impacting~~to the grey seal ~~from~~QI for Project Design Option 1.**

7.4.2.78 ~~7.5.2.36~~ **Based on the ~~increased~~representative risk of in-combination effects of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

TIER 1 AND 2 PROJECTS

7.4.2.79 Across Tier 1 and 2 projects, the predicted level of in-combination grey seal disturbance is unchanged from the Tier 1 assessment. This reflects the fact that there are no Tier 2 projects located within the East region of RoI for grey seals. Therefore, under a highly precautionary assumption that all other potential high-noise construction activities, including piling and UXO clearance, occur concurrently, the maximum in-combination number of grey seals predicted to be disturbed in 2029 remains as 1,524 animals, representing 91.70% of the East region of RoI population, and 15.34% of the combined population across the East and South-east RoI, Wales MU, and Northern Ireland MU for grey seals (Table 7.8).

7.4.2.80 Taking into account the appropriate population size for the in-combination assessment, the conclusions for the assessment alone for the grey seal QI of the Lambay Island SAC (the closest designated site of relevance to the Proposed Development; see Section 6.4.5), the conclusions presented for Tier 1 projects apply equally to the Tier 1 and Tier 2 scenario. In-combination effects are therefore considered to affect a small proportion of the population, albeit at an increased proportion relative to the alone assessment. While temporary behavioural changes or redistribution across multiple projects and years could result in minor, short-term reductions in reproductive output for some individuals, these effects are not expected to influence the population trajectory.

7.4.2.81 In relation to the site-specific COs for the Irish and Welsh SACs with grey seal QIs (Table 5.1), the potential effects of underwater noise associated with construction on grey seal have been assessed with reference to the CO for the QI across sites. For Irish sites, this is to maintain the species' favourable conservation condition, which is defined by the following attributes and targets: ensuring that human activities do not occur at levels that can affect the population at the site (through disturbance, injury or mortality), or restriction on access to or usage of the site. Coastal or terrestrial habitats used for breeding, moulting or resting will not be impacted by underwater noise. For Welsh sites, this is to maintain integrity of the site by ensuring that the grey

seal population using the SAC remains in favourable condition over the medium and long term. This requires that the population remains a viable component of the site, that seals can access and utilise the habitats necessary to support the population, and the condition of supporting habitats and processes, and the availability of prey is maintained.

7.4.2.82 While underwater noise generated from high-noise activities during construction may result in temporary displacement of grey seal, any behavioural response is expected to be limited to the period of noise generation, with individuals returning to affected areas within two hours (Russell *et al.,* 2016). It is noted that, due to the in-combination nature of construction across multiple projects, noise from other projects in close proximity to an SAC may lead to an increase in the timeframe over which animals may return. However, the iPCoD modelling demonstrates that even with in-combination noise disturbance occurring across the five Phase One offshore wind projects in close proximity, the effects on the grey seal population are insufficient to result in a population-level effect. The other Tier 2 project will affect a small number of animals, therefore this is not expected to measurably increase in-combination effects on the site. Therefore, the populations in the SACs are not expected to be significantly affected by in-combination construction activities. Furthermore, due to the temporary nature of the disturbance response, this will not comprise a permanent effect on the access or usage of the site, with grey seals expected to return following the cessation of high-noise construction activities.

~~7.5.2.37 No Tier 2 projects were included in this part of the cumulative assessment for grey seals, as none are within their respective MU. Therefore, there are no changes from the Tier 1 conclusions for this in-combination assessment.~~

~~TIER 1 AND 3 PROJECTS~~

~~7.5.2.38 The highest number of grey seals predicted to be disturbed across Tier 1, 2, and 3 projects between 2021 and 2034 is in 2024, 2025, and 2026. For the purposes of the assessment the number of animals disturbed has been calculated assuming that UXO clearance will occur in 2027 and piling in 2028, therefore, the highest number of seals is predicted to occur in the absence of the Proposed Development.~~

~~7.5.2.39 The maximum cumulative number of grey seals predicted to be disturbed is estimated as 309 animals (18.59% of the MU population), assuming two cable projects are constructing.~~

7.4.2.83 ~~7.5.2.40 When the Proposed Development is expected to be piling in 2028, the maximum cumulative number of grey seals predicted to be disturbed is estimated as 300 animals (18.05% of the MU population). The number of grey seals predicted to be impacted by the Proposed Development represents 100% of this total. With consideration that the alone assessment grey seal have negligible sensitivity to this kind of disturbance~~**Given the highly precautionary nature of the assessment, and the absence of predicted population-level effects or restrictions on site usage, it is concluded that there will be no AEoI~~~~,~~ **from the Proposed Development in-combination with Tier 1 and ~~3~~2 Projects~~, upon the integrity of~~ on any of the ~~above~~listed designated sites, as defined by ~~the~~their COs ~~of the site~~, as a result of disturbance from underwater noise ~~impacting~~to the grey seal ~~from~~QI for Project Design Option 1.**

7.4.2.84 ~~7.5.2.41~~ **Based on the ~~increased~~representative risk of in-combination effects of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

TIER 1, 2 AND 3 ~~AND PHASE 1~~ PROJECTS

7.4.2.85 Across Tier 1, 2 and 3 projects, the highest number of grey seals predicted to be disturbed across Tier 1, 2, and 3 projects between 2021 and 2034 is in 2029, which coincides with the expected construction period of the Proposed Development. Under a highly precautionary assumption that all other potential high-noise construction activities, including piling and UXO clearance, occur concurrently, the maximum in-combination number of grey seals predicted to be disturbed in 2029

is 1,872 animals, representing 112.64% of the East region of RoI population of 1,662 individuals and 18.84% of the combined population of 9,936 individuals across the East and South-east RoI, Wales MU, and Northern Ireland MU for grey seals (Table 7.8). The number of grey seals predicted to be impacted by the Proposed Development represents 7.05% of the total, indicating that the majority of predicted in-combination disturbance arises from other concurrent activities and projects within the wider region.

7.4.2.86 ~~7.5.2.42 For~~When considering only projects with higher data confidence (Tier 1 and 2), ~~the cumulative number~~predicted in-combination disturbance of grey seals ~~predicted to be disturbed is very low (0%~~remains limited to a relatively small proportion of the MU population~~) across the majority of years in the~~ throughout the assessment period ~~under consideration~~ (2021 – 2034)~~, with higher numbers from 2022 to 2028 (≤18.05% of the MU population). The average proportion of the~~. The highest predicted levels of disturbance occur during the Phase One offshore windfarm construction window between 2026 and 2032, peaking in 2029 at approximately 15.34% of the reference populations when assuming the combined population size (Table 7.8). Outside this peak construction window, predicted levels of disturbance are lower, with an average of 4.13% of the combined reference population ~~potentially~~predicted to be disturbed ~~by Tier 1 and 2 projects between~~across all years considered in this in-combination assessment (2021 to 2034)~~ is 6.79% of the MU population~~.

7.4.2.87 Taking into account the appropriate larger population size for the in-combination assessment, the conclusions for the assessment alone for the grey seal QI of the Lambay Island SAC (the closest designated site of relevance to the Proposed Development; see Section 6.4.5), the in-combination effects are considered to affect a small proportion of the population, albeit at an increased proportion relative to the alone assessment. While temporary behavioural changes or redistribution across multiple projects and years could result in minor, short-term reductions in reproductive output for some individuals, these effects are not expected to influence the population trajectory.

7.4.2.88 In relation to the COs for the Irish and Welsh SACs with grey seal QIs (Table 5.1), the potential effects of underwater noise associated with construction on grey seal have been assessed with reference to the CO for the QI across sites. For Irish sites, this is to maintain the species' favourable conservation condition, which is defined by the following attributes and targets: ensuring that human activities do not occur at levels that can affect the population at the site (through disturbance, injury or mortality), or restriction on access to or usage of the site. Coastal or terrestrial habitats used for breeding, moulting or resting will not be impacted by underwater noise. For Welsh sites, this is to maintain integrity of the site by ensuring that the grey seal population using the SAC remains in favourable condition over the medium and long term. This requires that the population remains a viable component of the site, that seals can access and utilise the habitats necessary to support the population, and the condition of supporting habitats and processes, and the availability of prey is maintained.

7.4.2.89 While underwater noise generated from high-noise activities during construction may result in temporary displacement of grey seal, any behavioural response is expected to be limited to the period of noise generation, with individuals returning to affected areas within two hours (Russell *et al.,* 2016). It is noted that, due to the in-combination nature of construction across multiple projects, noise from other projects in close proximity to an SAC may lead to an increase in the timeframe over which animals may return. However, the iPCoD modelling demonstrates that even with cumulative noise disturbance occurring across the five Phase One offshore wind projects in close proximity, the effects on the grey seal population are insufficient to result in a population-level effect. Furthermore, the potential for the Tier 3 project to contribute to in-combination disturbance on an SAC, in addition to the Proposed Development, is of lower likelihood. Therefore, the populations of the SACs are not expected to be significantly affected by in-combination construction activities. Furthermore, due to the temporary nature of the disturbance

response, this will not comprise a permanent effect on the access or usage of the site, with grey seals expected to return following the cessation of high-noise construction activities.

~~7.5.2.43 The highest number of grey seals predicted to be disturbed across Tier 1, 2, 3, and Phase 1 projects between 2021 and 2034 is in 2027, which coincides with the assumed UXO clearance campaign of the Proposed Development. The maximum cumulative number of grey seals predicted to be disturbed in 2027 is estimated as 2,422 animals (145.73% of the MU population) assuming two offshore windfarms are piling, two offshore windfarms are undertaking UXO clearance, and one cable project is constructing on the same day as the Proposed Development. The number of grey seals predicted to be impacted by the Proposed Development represents 7% of this total.~~

~~7.5.2.44 When the Proposed Development is expected to be piling in 2028, the maximum cumulative number of grey seals predicted to be disturbed is estimated as 2,019 animals (121.48% of the MU population), assuming one offshore windfarm is piling, and one is undertaking UXO clearance on the same day as piling at the Proposed Development. The number of grey seals predicted to be impacted by the Proposed Development represents 15% of this total.~~

~~7.5.2.45 The number of animals available in the area that could be disturbed are being over-predicted as it exceeds the MU population size of 1,662 animals within the East region of Ireland. Considering the typical foraging distances of grey seals (Carter *et al.*, 2022), it is possible that seals from the East and South-east survey regions of the Ireland presented in Morris and Duck (2019), and from the Wales and Northern Ireland Management Units (SCOS, 2022), could also be disturbed by construction activities at projects screened into this assessment, including the Proposed Development. Therefore, for the purposes of the in-combination assessment, it is more appropriate to consider the population of the East and South-east Ireland, Wales MU, and Northern Ireland MU for grey seal as 9,936 animals. If the population size is assumed to be 9,936 animals, the percentage of the population predicted to be disturbed in 2028 reduces to 20.32%.~~

7.4.2.90 ~~7.5.2.46 With consideration that the alone assessment grey seal have negligible sensitivity to this kind of disturbance~~**Given the highly precautionary nature of the assessment, and the absence of predicted population-level effects or restrictions on site usage, it is concluded that there will be no AEoI~~**,** **from the Proposed Development in-combination with Tier 1, 2 and 3 ~~and Phase 1~~ Projects~~, upon the integrity of~~ on any of the ~~above~~listed designated sites, as defined by ~~the~~their COs ~~of the site~~, as a result of disturbance from underwater noise ~~impacting~~to grey seal ~~from~~QI for Project Design Option 1.**

7.4.2.91 ~~7.5.2.47~~ **Based on the ~~increased~~representative risk of in-combination effects of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

Table 7.8: Number of grey seal disturbed by underwater noise in the in-combination assessment.

The Proposed Development construction window is indicated by red bars. Orange = Not yet/no longer operational; Grey = Abandoned/not in use; Blue = Construction; Pale blue = Decommissioning; Navy = Operation and maintenance

Project	Tier	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Proposed Development	1							132	132	132	132				
Codling Wind Park	1						348	348	348	348					
Dublin Array	1									348	348	348	348		
Oriel	1								348	348	348				
NISA	1							348	348	348	348				
Mares Connect	3						22	22	22						
ABWP 1	3							348	348	348	348				
Tier 1		0	0	0	0	0	348	828	1,176	1,524	1,176	348	348	0	0
% MU (alone)[1]		0.00 %	0.00 %	0.00 %	0.00 %	0.00 %	20.94 %	49.82 %	70.76 %	91.70%	70.76 %	20.94 %	20.94 %	0.00 %	0.00 %
% MU (combined)[2]		0.00 %	0.00 %	0.00 %	0.00 %	0.00 %	3.50%	8.33%	11.84 %	15.34%	11.84 %	3.50%	3.50%	0.00 %	0.00 %
Tier 1 and 2		0	0	0	0	0	348	828	1,176	1,524	1,176	348	348	0	0
% MU (alone)[1]		0.00 %	0.00 %	0.00 %	0.00 %	0.00 %	20.94 %	49.82 %	70.76 %	91.70%	70.76 %	20.94 %	20.94 %	0.00 %	0.00 %
% MU (combined)[2]		0.00 %	0.00 %	0.00 %	0.00 %	0.00 %	3.50%	8.33%	11.84 %	15.34%	11.84 %	3.50%	3.50%	0.00 %	0.00 %
Tier 1, 2 and 3		0	0	0	0	0	370	1,198	1,524	1,872	1,524	348	348	0	0
% MU (alone)[1]		0.00 %	0.00 %	0.00 %	0.00 %	0.00 %	22.26 %	72.08 %	91.70 %	112.64 %	91.70 %	20.94 %	20.94 %	0.00 %	0.00 %
% MU (combined)[2]		0.00 %	0.00 %	0.00 %	0.00 %	0.00 %	3.72%	12.06 %	15.34 %	18.84%	15.34 %	3.50%	3.50%	0.00 %	0.00 %

[1]Reference population represents the scaled East region of RoI population of 1,662 individuals (Morris and Duck, 2019).

[2]Reference population presents the scaled combined regions of East and South-east RoI, Wales MU and Northern Ireland MU of 9,936 individuals (Morris and Duck, 2019; SCOS, 2024).

DISTURBANCE FROM UNDERWATER NOISE ON BOTTLENOSE DOLPHIN ~~– PILING ACTIVITIES~~

7.4.2.92 ~~7.5.2.48~~ The following are the designated sites for bottlenose dolphin considered within this in-combination assessment:

- Lleyn Peninsula and the Sarnau / Pen Llyn a'r Sarnau SAC;
- Cardigan Bay / Bae Ceredigion SAC; and
- Hook Head SAC.

~~• Belgica Mound Province SAC~~

TIER 1 PROJECTS

7.4.2.93 Across Tier 1 projects

~~7.5.2.49~~ , the highest ~~number of~~predicted level of in-combination bottlenose ~~dolphins predicted to be disturbed across Tier 1 projects~~dolphin disturbance between 2021 and 2034 is in ~~2028~~2029, which coincides with the expected ~~pile driving campaign~~construction period of the Proposed Development ~~(2028)~~. Under a highly precautionary assumption that all other potential high-noise construction activities, including piling and UXO clearance, occur concurrently, the maximum ~~cumulative~~in-combination number of bottlenose dolphins predicted to be disturbed in ~~2028 is estimated as 2,092~~2029 is 2,365 animals ~~(713.96~~, representing 807.17% of the Irish Sea MU population~~). The number of bottlenose dolphins predicted to be impacted by the Proposed Development represents 100% of this total.~~ (Table 7.9).

7.4.2.94 ~~As with~~As discussed within the ~~above~~ alone assessment~~, this is clearly an over estimation with consideration that the~~ (see Section 6.4.18), the number of animals available in the area that could be disturbed are being over-predicted as it exceeds the Irish Sea MU population size ~~is~~of 293 animals. However, this population size does not take into account the connectivity of the MU population with other areas~~. Studies have shown large scale movement of bottlenose dolphins around Ireland and indicated connectivity with the population on the west coast of the Ireland~~ (O'Brien *et al.*, 2009~~). Long distance movements from the Atlantic to the North Sea between populations in the UK and Ireland have also been reported by~~; Robinson *et al.* ~~(~~, 2012~~). Therefore, the size of the reference population used from the Irish Sea MU is likely to be an under-representation of~~ ; NRW, 2025b). If the SCANS-IV abundance estimate for the Irish Sea (blocks CS-D and CS-E) of 8,326 animals is utilised instead, the percentage of the population predicted to be disturbed reduces to 28.40% (Table 7.9). The number of bottlenose dolphins ~~that may be present in~~predicted to be impacted by the Proposed Development~~. Equally, the most recent abundance estimates from the semi-resident population at Cardigan Bay in West Wales (which is within the Irish Sea MU) alone were 147 individuals (95% CI: 127 to 194; NRW, 2018). The design of broad scale surveys, such as SCANS, used to derive MU population estimates are not designed to capture localised, coastal populations such as that of the semi-resident population in Cardigan Bay, providing further evidence to suggest that the reference population size has been under-estimated.~~ represents 49.94% of the total, with the remaining predicted in-combination disturbance attributable to other concurrent activities and projects within the MU.

7.4.2.95 A key source of precaution in this assessment is that the harbour porpoise EDRs have been used for bottlenose dolphins, as there is no equivalent for this species. Harbour porpoise have a higher hearing sensitivity than bottlenose dolphins (Southall *et al.*, 2019) and are considered to be particularly responsive to anthropogenic disturbance, with multiple studies showing that porpoises respond (avoidance and reduced vocalisation) to a variety of anthropogenic noise sources to distances of multiple kilometres (Brandt *et al.*, 2013; Thompson *et al.*, 2013a; Tougaard *et al.*, 2013; Brandt *et al.*, 2018; Sarnocinska *et al.*, 2020; Benhemma-Le Gall *et al.*, 2021; Benhemma-Le Gall *et al.*, 2023).

7.4.2.96 ~~7.5.2.50 As concluded within the alone assessment,~~ Studies have shown that dolphin species show comparatively less of a disturbance response from underwater noise compared to harbour porpoise (~~e.g. Culloch *et al.*, 2016;~~ Kastelein *et al.*, 2006; Stone *et al.*, 2017). For example, bottlenose dolphins in the Moray Firth have been shown to remain in the impacted area during both seismic activities and pile installation activities (Fernandez-Betelu *et al.*, 2021) ~~which suggests a lack of displacement~~, which demonstrates a reduced behavioural response (i.e. displacement) as compared to harbour porpoise. Considering the above, it ~~is~~can be concluded that using EDRs derived from studies on harbour porpoise ~~response data~~ as a proxy for bottlenose dolphins is likely to result in an over-estimate of the number of bottlenose dolphins predicted to experience disturbance ~~or change their behaviour due to disturbance. With consideration that none of the designated sites with bottlenose dolphins as QIs have COs relating specifically to human disturbance, and that there is no evidence that the predicted disturbance would result in an impact on the other COs,~~ ~~**it is concluded that there will be no AEoI, from the Proposed Development in-combination with Tier 1 Projects, upon the integrity of any of the above designated sites, as defined by the COs of the site, as a result of disturbance from underwater noise impacting bottlenose dolphin from Project Design Option 1.**~~.

~~7.5.2.51 **Based on the increased risk of in-combination effects of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**~~

~~TIER 1 AND 2 PROJECTS~~

~~7.5.2.52 The highest number of bottlenose dolphins predicted to be disturbed across Tier 1 and 2 projects between 2021 and 2034 is in 2028, which coincides with the expected pile driving campaign of the Proposed Development (2028). The maximum cumulative number of bottlenose dolphins predicted to be disturbed in 2028 is estimated as 2,132 animals (727.65% of MU population), assuming piling on the same day as the Proposed Development at Awel y Môr offshore windfarm and Holyhead Deep tidal energy project. If the population size is assumed to be 8,326 animals, the percentage of the population predicted to be disturbed reduces to 25.60%. The number of bottlenose dolphins predicted to be impacted by the Proposed Development represents 98% of this total.~~

7.4.2.97 The iPCoD modelling indicates that pile driving causes a slight initial reduction in mean bottlenose dolphin population size under both the dose-response and Level B harassment approaches, after which the population stabilises at approximately 95-98% of the un-impacted mean population size. It is also important to consider that as the iPCoD model does not currently allow for a density-dependent responses, there is no possibility for the impacted population to increase in size following piling disturbance. Despite this small initial reduction, the long-term population trajectory remains stable (NIS Volume III, Appendix 11.3: Phase 1 Irish Offshore Wind Farms: Cumulative iPCoD Modelling).

7.4.2.98 Taking account of the appropriate combined population size for the in-combination assessment and the conclusions of the assessment alone for the bottlenose dolphin QI of the Lleyn Peninsula and the Sarnau SAC (the closest designated site of relevance to the Proposed Development; see Section 6.4.18), the in-combination effects are considered to affect a small proportion of the MU population, albeit at an increased proportion relative to the alone assessment. While temporary behavioural changes or redistribution across multiple projects and years could result in minor, short-term reductions in reproductive output for some individuals, these effects are not expected to influence the population trajectory.

7.4.2.99 In relation to the COs for Irish and Welsh sites for bottlenose dolphin (Table 5.1), the potential effects of underwater noise associated with construction on bottlenose dolphin have been assessed with reference to the CO for the QI across sites. For Hook Head SAC, this is to maintain the species' favourable conservation condition, which is defined by the following attributes and targets: ensuring that human activities do not occur at levels that can affect the population at the

site (through disturbance, injury or mortality, or effects on demographic parameters or residency), or restriction on access to or usage of the site. For Welsh sites, this is to maintain the integrity of the site by ensuring that the bottlenose dolphin population remains in favourable condition over the medium and long term. This requires that the population remains a viable component of the site, dolphins can access and utilise the habitats necessary to support the population, and the condition of supporting habitats and processes, and the availability of prey is maintained.

7.4.2.100 Underwater noise generated from high-noise activities during construction may result in temporary displacement of bottlenose dolphin (Graham *et al.*, 2017a), though other studies have demonstrated a lack of displacement from preferred habitat when distant from the piling noise (Fernandez-Betelu *et al.*, 2021). It is noted that, due to the in-combination nature of construction across multiple projects, noise from other projects in close proximity to an SAC may lead to an increase in the timeframe over which animals may return.

7.4.2.101 The iPCoD modelling demonstrates that with cumulative noise disturbance occurring across the five Phase One offshore wind projects in close proximity, the bottlenose dolphin population trajectory remains stable at 95-98% of the original size, despite a slight initial reduction. All other Tier 1 projects are located at significant distance from the Phase Ones (e.g. offshore wind farms in Welsh or English waters) or will affect a small number of animals (i.e. Greenlink Interconnector), therefore these additional projects are not expected to increase in-combination effects on any local population (e.g. SAC population) of bottlenose dolphin within the MU. Therefore, the population at any SAC within the MU is not expected to be significantly affected by in-combination construction activities.

7.4.2.102 It is highlighted that the disturbance contours from the Proposed Development do not overlap with Hook Head SAC and Belgica Mound Province SAC, therefore there is not predicted to be any temporary disturbance in these sites from the Proposed Development. Therefore, the Proposed Development will not contribute to any in-combination displacement effects in those sites that could comprise restriction on access. The outermost disturbance contours from the Proposed Development overlap the Lleyn Peninsula and the Sarnau SAC, but the probability of a disturbance response to the noise levels in the sites are low (Section 6.4.18). This is also expected to be the case for Cardigan Bay SAC which is close to the Lleyn Peninsula and the Sarnau SAC. Other Tier 1 projects are similarly distant to these SACs and therefore expected to have a similar low probability of leading to displacement from these SACs, therefore no restriction on access to the sites or habitats surrounding the sites are predicted. Furthermore, due to the temporary or unlikely nature of the disturbance response, this will not comprise a permanent effect on the access or usage of the site, with bottlenose dolphin expected to return following the cessation of high-noise construction activities.

7.4.2.103 ~~7.5.2.53 The above conclusions with Tier 1 projects (Section 7.4.2.4) are applicable to this wider consideration of projects, and therefore~~**Given the highly precautionary nature of the assessment, the predicted stable population trajectory, and absence of restrictions on site usage, it is concluded that there will be no AEoI~~~~,~~ **from the Proposed Development in-combination with Tier 1** ~~**and 2**~~ **Projects**~~**, upon the integrity of**~~ **on any of the** ~~**above**~~**listed designated sites, as defined by** ~~**the**~~**their COs** ~~**of the site**~~**, as a result of disturbance from underwater noise** ~~**impacting**~~**to the bottlenose dolphin** ~~**from**~~**QI for Project Design Option 1.**

7.4.2.104 ~~7.5.2.54~~ **Based on the** ~~**increased**~~**representative risk of in-combination effects of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

TIER 1~~,~~ AND 2 ~~AND 3~~ PROJECTS

7.4.2.105 ~~7.5.2.55 The highest number of bottlenose dolphins predicted to be disturbed~~ Across Tier 1~~,~~ and 2~~, and 3~~ projects, the highest predicted level of in-combination bottlenose dolphin disturbance across Tier 1 and 2 projects between 2021 and 2034 is in ~~2027 and 2028~~2029, which coincides with the ~~assumed UXO clearance campaign and the~~ expected ~~pile driving campaign~~construction

period of the Proposed Development. Under a highly precautionary assumption that all other potential high-noise construction activities, including piling and UXO clearance, occur concurrently, the maximum ~~cumulative~~in-combination number of bottlenose dolphins predicted to be disturbed in ~~2027 and 2028 is estimated as 2,353 animals (807.07% of the MU population), assuming three offshore windfarms are piling, one tidal project and one cable project are constructing, and one seismic survey occurs on the same day as piling at the Proposed Development. If the population size is assumed to be 8,326 animals, the percentage~~2029 is 2,365 animals, representing 807.17% of Irish Sea MU reference population or 28.40% of the population ~~predicted to be disturbed reduces to 28.26%~~using the SCANS-IV abundance estimate (Table 7.9). The number of bottlenose dolphins predicted to be impacted by the Proposed Development represents ~~89~~49.94% of ~~this~~the total, with the remaining predicted in-combination disturbance attributable to other concurrent activities and projects within the MU.

7.4.2.106 ~~7.5.2.56 Overall, the predicted extent of the cumulative disturbance is to a relatively~~Taking account of the appropriate larger population size for the in-combination assessment, the conclusions of the assessment alone for the bottlenose dolphin QI of the Lleyn Peninsula and the Sarnau SAC (Section 6.4.18), the in-combination effects are considered to affect a small proportion of the MU population, albeit at an increased proportion relative to the ~~most recent abundance estimates for this area using the SCANS IV surveys, with short-term~~alone assessment. While temporary behavioural changes ~~expected from each disturbance event that an individual is exposed to. The overall disturbance effect is predicted to occur~~or redistribution across multiple projects and ~~over several years, the temporary changes in behaviour and/or distribution of individuals~~years could result in ~~potential~~minor, short-term reductions in reproductive ~~rates of~~output for some individuals~~. However, the cumulative disturbance is not considered enough to affect the long-term viability of~~, these effects are not expected to influence the population trajectory.

7.4.2.107 In relation to the site-specific COs for Irish and Welsh sites for bottlenose dolphin (Table 5.1), the potential effects of underwater noise associated with construction on bottlenose dolphin have been assessed with reference to the CO for the QI across sites, For Hook Head SAC, this to maintain the species' favourable conservation condition, which is defined by the following attributes and targets: ensuring that human activities do not occur at levels that can affect the population at the site (through disturbance, injury or mortality, or effects on demographic parameters or residency), or restriction on access to or usage of the site. For Welsh sites, this is to maintain the integrity of the site by ensuring that the bottlenose dolphin population remains in favourable condition over the medium and long term. This requires that the population remains a viable component of the site, dolphins can access and utilise the habitats necessary to support the population, and the condition of supporting habitats and processes, and the availability of prey is maintained.

7.4.2.108 Underwater noise generated from high-noise activities during construction may result in temporary displacement of bottlenose dolphin (Graham *et al.*, 2017a), though other studies have demonstrated a lack of displacement from preferred habitat when distant from the piling noise (Fernandez-Betelu *et al.*, 2021). It is noted that, due to the in-combination nature of construction across multiple projects, noise from other projects in close proximity to an SAC may lead to an increase in the timeframe over which animals may return.

7.4.2.109 The iPCoD modelling demonstrates that with cumulative noise disturbance occurring across the five Phase One offshore wind projects in close proximity, the bottlenose dolphin population trajectory remains stable at 95-98% of the original size, despite a slight initial reduction. All other Tier 1 and 2 projects are located at significant distance from the Phase Ones (e.g. offshore wind farms in Welsh or English waters) or will affect a small number of animals (i.e. interconnectors and tidal devices), therefore these additional projects are not expected to increase in-combination effects on any local population (e.g. SAC population) of bottlenose dolphin within the MU.

Therefore, the population at any SAC within the MU is not expected to be significantly affected by in-combination construction activities.

7.4.2.110 It is highlighted that the disturbance contours from the Proposed Development do not overlap with Hook Head SAC and Belgica Mound Province SAC, therefore there is not predicted to be any temporary disturbance in these sites from the Proposed Development. Therefore, the Proposed Development will not contribute to any in-combination displacement effects in those sites that could comprise restriction on access. The outermost disturbance contours from the Proposed Development overlap the Lleyn Peninsula and the Sarnau SAC, but the probability of a disturbance response to the noise levels in the sites are low (Section 6.4.18). This is also expected to be the case for Cardigan Bay SAC which is close to the Lleyn Peninsula and the Sarnau SAC. Most other Tier 1 and 2 projects are similarly distant to these SACs and therefore expected to have a similar low probability of leading to displacement from these SACs; or they have a very low likelihood of leading to displacement (e.g. from tidal devices). Therefore, no restriction on access to the sites or habitats surrounding the sites are predicted. Furthermore, due to the temporary or unlikely nature of the disturbance response, this will not comprise a permanent effect on the access or usage of the site, with bottlenose dolphin expected to return following the cessation of high-noise construction activities.

7.4.2.111 ~~7.5.2.57 The above conclusions with Tier 1 projects (Section 7.4.2.4) are applicable to this wider consideration of projects, and therefore~~**Given the highly precautionary nature of the assessment, the predicted stable population trajectory, and absence of restrictions on site usage, it is concluded that there will be no AEoI~~~~,~~ **from the Proposed Development in-combination with Tier 1~~,~~ and 2 ~~and 3~~ Projects~~, upon the integrity of~~ on any of the ~~above~~listed designated sites, as defined by ~~the~~their COs ~~of the site~~, as a result of disturbance from underwater noise ~~impacting~~to the bottlenose dolphin ~~from~~QI for Project Design Option 1.**

7.4.2.112 ~~7.5.2.58~~ **Based on the ~~increased~~representative risk of in-combination effects of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

TIER 1, 2~~,~~ AND 3 ~~AND PHASE 1~~ PROJECTS

7.4.2.113 Across Tier 1, 2 and 3 projects, the highest predicted level of in-combination bottlenose dolphin disturbance between 2021 and 2034 is in 2029, which coincides with the expected construction period of the Proposed Development. Under a highly precautionary assumption that all other potential high-noise construction activities, including piling and UXO clearance, occur concurrently, the maximum in-combination number of bottlenose dolphins predicted to be disturbed in 2029 is 3,674 animals, representing 1,253.92% of the Irish Sea MU reference population or 44.13% of the population using the SCANS-IV abundance estimate (Table 7.9).

7.4.2.114 ~~7.5.2.59 For~~When considering only projects with higher data confidence (Tier 1 and 2), ~~the cumulative number of bottlenose dolphins~~ predicted in-combination disturbance remains low throughout the assessment period (2021-2034). The highest predicted levels of disturbance occur between 2027 and 2030, peaking in 2029 at approximately 28.40% of the larger population size (Table 7.9). Outside this peak construction window, predicted levels of disturbance are lower, with an average of 8.36% of the larger reference population predicted to be disturbed ~~is low (≤ 1% of the MU population) across the majority of years in the period under consideration (2021 – 2034), with higher numbers in 2028 (≥25.61% of the MU population). The average proportion of the population potentially disturbed by Tier 1 and 2 projects between~~across all years considered in this in-combination assessment (2021 to 2034) ~~is 2.63% of the MU population, assuming a population size of 8,326 animals~~.

~~7.5.2.60 The highest number of bottlenose dolphins predicted to be disturbed across Tier 1, 2, 3, and Phase 1 projects between 2021 and 2034 is in 2028, which coincides with the expected pile driving campaign of the Proposed Development. The maximum cumulative number of bottlenose~~

~~dolphins predicted to be disturbed in 2028 is estimated as 3,351 animals, assuming four offshore windfarms are piling, high order UXO clearance at one offshore windfarm, one tidal project and one cable project are constructing, and one seismic survey occurs on the same day as piling at the Proposed Development. If the population size is assumed to be 8,326 animals, the percentage of the population predicted to be disturbed is 40.25%. The number of bottlenose dolphins predicted to be impacted by the Proposed Development represents 62% of this total. The average proportion of the population potentially disturbed between all years considered in this in-combination assessment (2021 to 2034) represents 8.70% of the MU population, assuming a population size of 8,326 animals based on the most recent SCANS IV surveys that covered the MU area. It is important to note that the Tier 3 projects are less likely to contribute to a cumulative impact due to the uncertainty that they will go ahead, and thus there is little confidence in the result of this assessment.~~

7.4.2.115 Taking account of the appropriate larger population size for the in-combination assessment and the conclusions of the assessment alone for the bottlenose dolphin QI of the Lleyn Peninsula and the Sarnau SAC (the closest designated site of relevance to the Proposed Development; see Section 6.4.18), the in-combination effects are considered to affect a moderate proportion of the MU population, an increased proportion relative to the alone assessment. While temporary behavioural changes or redistribution across multiple projects and years could result in minor, short-term reductions in reproductive output for some individuals, these effects are not expected to influence the population trajectory.

7.4.2.116 In relation to the COs for Irish and Welsh sites for bottlenose dolphin (Table 5.1), the potential effects of underwater noise associated with construction on bottlenose dolphin have been assessed with reference to the CO for the QI across sites. to maintain the species' favourable conservation condition, which is defined by the following attributes and targets: ensuring that human activities do not occur at levels that can affect the population at the site (through disturbance, injury or mortality, or effects on demographic parameters or residency), or restriction on access to or usage of the site. For Welsh sites, this is to maintain the integrity of the site by ensuring that the bottlenose dolphin population remains in favourable condition over the medium and long term. This requires that the population remains a viable component of the site, dolphins can access and utilise the habitats necessary to support the population, and the condition of supporting habitats and processes, and the availability of prey is maintained.

7.4.2.117 Underwater noise generated from high-noise activities during construction may result in temporary displacement of bottlenose dolphin (Graham *et al.*, 2017a), though other studies have demonstrated a lack of displacement from preferred habitat when distant from the piling noise (Fernandez-Betelu *et al.*, 2021). It is noted that, due to the in-combination nature of construction across multiple projects, noise from other projects in close proximity to an SAC may lead to an increase in the timeframe over which animals may return.

7.4.2.118 The iPCoD modelling demonstrates that with cumulative noise disturbance occurring across the five Phase One offshore wind projects in close proximity, the bottlenose dolphin population trajectory remains stable at 95-98% of the original size, despite a slight initial reduction. All other Tier 1, 2 and 3 projects are located at significant distance from the Phase Ones (e.g. offshore wind farms in Welsh or English waters), or will affect a small number of animals (i.e. interconnectors and tidal devices), or have a low likelihood of occurring at the assumed time (e.g. seismic survey), therefore these additional projects are not expected to increase in-combination effects on any local population (e.g. SAC population) of bottlenose dolphin within the MU. Therefore, the population at any SAC within the MU is not expected to be significantly affected by in-combination construction activities.

7.4.2.119 It is highlighted that the disturbance contours from the Proposed Development do not overlap with Hook Head SAC and Belgica Mound Province SAC, therefore there is not predicted to be any temporary disturbance in these sites from the Proposed Development. Therefore, the

Proposed Development will not contribute to any in-combination displacement effects in those sites that could comprise restriction on access. The outermost disturbance contours from the Proposed Development overlap the Lleyn Peninsula and the Sarnau SAC, but the probability of a disturbance response to the noise levels in the sites are low (Section 6.4.18). This is also expected to be the case for Cardigan Bay SAC which is close to the Lleyn Peninsula and the Sarnau SAC. Most other Tier 1, 2 and 3 projects are similarly distant to these SACs and therefore expected to have a similar low probability of leading to displacement from these SACs; or they have a very low likelihood of leading to displacement (e.g. from tidal devices). Therefore no restriction on access to the sites or habitats surrounding the sites are predicted. Furthermore, due to the temporary or unlikely nature of the disturbance response, this will not comprise a permanent effect on the access or usage of the site, with bottlenose dolphin expected to return following the cessation of high-noise construction activities.

7.4.2.120 ~~7.5.2.61 The above conclusions with Tier 1 projects (Section 7.4.2.4) are applicable to this wider consideration of projects, and therefore~~**Given the highly precautionary nature of the assessment, the predicted stable population trajectory, and absence of restrictions on site usage, it is concluded that there will be no AEoI~~~~,~~ **from the Proposed Development in-combination with Tier 1, 2~~~~,~~ and 3 ~~and Phase 1~~ Projects~~, upon the integrity of~~ on any of the ~~above~~listed designated sites, as defined by ~~the~~their COs ~~of the site~~, as a result of disturbance from underwater noise ~~impacting~~to the bottlenose dolphin ~~from~~QI for Project Design Option 1.**

7.4.2.121 ~~7.5.2.62~~ **Based on the ~~increased~~representative risk of in-combination effects of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

Table 7.9: Number of bottlenose dolphins disturbed by underwater noise in the in-combination assessment.

The Project construction window is indicated by red bars. Orange = Not yet/no longer operational; Grey = Abandoned/not in use; Blue = Construction; Pale blue = Decommissioning; Navy = Operation and maintenance

Project	Tier	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Proposed Development	1							1,181	1,181	1,181	1,181				
Codling Wind Park	1						296	296	296	296					
Dublin Array	1									296	296	296	296		
NISA	1							296	296	296	296				
Oriel	1								296	296	296				
Greenlink Interconnector	1				33	33	33								
Burbo Bank	1											14	14	14	14
Walney 1	1											14	14	14	14
Awel y Môr	1			14	14	14	14	14							
Morgan	1					14	14	14	14						
North Hoyle	1											14	14	14	14
Holyhead Deep	2						19	19							
Mona	2					14	14	14	14						
West Anglesey Demonstration Zone	2		19	19	19	19	19								
Morecambe	3							14	14	14	14				
Mooir Vannin	3								296	296	296	296			
ABWP 1	3							296	296	296	296				
Mares Connect	3						19	19	19						
Rosslare ORE	3							19	19						
Port of Waterford ORE	3						0	0	0						
North Channel Wind 2	3								296	296	296	296			
North Channel Wind 1	3								296	296	296	296			
Seismic survey 1	3	111	111	111	111	111	111	111	111	111	111	111	111	111	111
Tier 1		0	0	14	47	61	357	1,801	2,083	2,365	2,069	338	338	42	42

% MU (alone)[1]	0.00 %	0.00 %	4.78 %	16.0 4%	20.8 2%	121.8 4%	614.6 8%	710.92 %	807.17 %	706.14 %	115.3 6%	115.3 6%	14.3 3%	14.3 3%
% MU (combined)[2]	0.00 %	0.00 %	0.17 %	0.56 %	0.73 %	4.29 %	21.63 %	25.02 %	28.40 %	24.85 %	4.06 %	4.06 %	0.50 %	0.50 %
Tier 1 and 2	0	19	33	66	94	409	1,834	2,097	2,365	2,069	338	338	42	42
% MU (alone)[1]	0.00 %	6.48 %	11.2 6%	22.5 3%	32.0 8%	139.5 9%	625.9 4%	715.70 %	807.17 %	706.14 %	115.3 6%	115.3 6%	14.3 3%	14.3 3%
% MU (combined)[2]	0.00 %	0.23 %	0.40 %	0.79 %	1.13 %	4.91 %	22.26 %	25.19 %	28.40 %	24.85 %	4.06 %	4.06 %	0.50 %	0.50 %
Tier 1, 2 and 3	111	130	144	177	205	539	2,293	3,444	3,674	3,378	1,337	449	153	153
% MU (alone)[1]	37.8 8%	44.3 7%	49.1 5%	60.4 1%	69.9 7%	183.9 6%	782.5 9%	1,175. 43%	1,253. 92%	1,152. 90%	456.3 1%	153.2 4%	52.2 2%	52.2 2%
% MU (combined)[2]	1.33 %	1.56 %	1.73 %	2.13 %	2.46 %	6.47 %	27.54 %	41.14 %	44.13 %	40.57 %	16.06 %	5.39 %	1.84 %	1.84 %

[1]Reference population represents the Irish Sea MU population of 293 individuals (IAMMWG, 2023).

[2]Reference population represents SCANS-IV abundance estimate of the Irish Sea (blocks CS-D and CS-E) of 8,326 individuals (Gilles et al., 2023).

7.4.3 ~~7.5.3~~ Annex II Migratory Fish Species

7.4.3.1 ~~7.5.3.1~~ The in-combination migratory fish species assessment has considered the same potential impacts, SAC and ~~features~~QIs screened in for assessment of the Proposed Development alone (Section 6.6). The additional Plans and Projects considered are listed in Table 7.3 above.

~~7.5.3.2 Tier 1 projects screened in include a number of power and telecommunication cables. All, other than CeltixConnect, will be operational at the time construction works of the Proposed Development commence. The construction of CeltixConnect may overlap with the construction phase for the Proposed Development and the operation of all Tier 1 cables may overlap the construction and operational phase of the Proposed Development.~~

7.4.3.2 ~~7.5.3.3~~ Tier 1 projects screened in also includes dredge disposal~~.~~ for the Dublin Port company ~~are licensed for the disposal of 1,102,723 tonnes of dredged material and the exact numbers on the extent and volume of sediment to be disposed of are not available for~~and Wexford County Council ~~dredge~~, with disposal~~. Disposal is~~ scheduled to take place during the construction and operational and maintenance phases of the Proposed Development ~~for Dublin Port Company and during the construction phase of the Proposed Development for Wexford County Council~~. Tier 1 projects also include the operation of ABWP1~~. ABWP1 is currently operational and~~, bed-level dredging for Wicklow County Council and dredge disposal for the Wexford County Council. ABWP1 consists of seven WTGs and ~~the operation~~taking a precautionary approach the operational phase of ABWP1 may overlap with the construction and ~~operation~~operational phases of the Proposed Development. Disposal for Wexford County Council and dredging for Wicklow County Council are scheduled to take place during the construction phase of the Proposed Development.

~~7.5.3.4 Tier 3 projects screened in include the construction and operation of Mares Connect and decommissioning of ABWP1. The construction and operation of Mares connect may overlap with the construction and operational and maintenance phase for the Proposed Development. The decommissioning of ABWP1 may overlap with the construction phase of the Proposed Development.~~

~~7.5.3.5 Decommissioning of ABWP1 will involve the cutting of monopiles at a depth of 3m below seabed, removal of monopiles and cutting, burial and backfilling of proportions of the inter-array cables. Decommissioning is anticipated to take 4 months between 2025 and 2027.~~

7.4.3.3 ~~7.5.3.6~~ Phase ~~1~~One OWF projects screened in ~~include~~as Tier 1 projects (including associated ECC) consist of Codling Wind Park, Dublin Array and ~~North Irish Sea Array~~NISA. The construction phase of Codling Wind Park, Dublin Array and ~~North Irish Sea Array~~NISA may overlap with the construction phase of the Proposed Development~~. The operation~~, with the construction phase for Dublin Array also overlapping with the operational phase of the Proposed Development. The operational phase of Codling Wind Park, Dublin Array and ~~North Irish Sea Array~~NISA may overlap with the ~~construction and/or operation phases~~operational phase of the Proposed Development.

7.4.3.4 ~~7.5.3.7~~ Plans for Dublin Array indicate that the proposed development will comprise a maximum of ~~61~~45 WTGs~~, three OSP's and three export cables (Innogy, 2020~~ and 1 OSP (Kish Offshore Wind Ltd., 2025). Plans for Codling Wind Park indicate that the proposed development may comprise up to ~~140~~75 WTGs~~, six export cables~~ and up to ~~five~~three OSPs (~~CWP, 2020~~Codling Wind Park, 2024). Plans for ~~North Irish Sea Array~~NISA indicate ~~35~~up to ~~46~~49 WTGs ~~with associated OSPs and cabling (Arup, 2021~~and 1 OSP (Ove Arup & Partners Ireland Limited, 2024). All the Phase ~~1~~one projects show similar construction, operation and decommissioning activities and therefore the impacts and magnitudes of the impacts are expected to be similar in nature to that of the Proposed Development.

7.4.3.5 There are no Tier 2 project screened in to the assessment.

7.4.3.6 Tier 3 projects screened in are the decommissioning of ABWP1, Rosslare Euro Port and Mares Connect. The decommissioning of ABWP1 may overlap with the construction phase of the Proposed Development. In the absence of any decommissioning details in relation to ABWP1, indicative decommissioning methodologies and assumptions are informed by the Rehabilitation Schedule (NIS Volume III, Appendix 4.1: Rehabilitation Schedule) for the Proposed Development. The owner and operator of the ABWP1, Arklow Energy Limited has commenced pre-application consultation (Case Reference OC27.321635) with the appropriate local authorities to decommission ABWP1, which has reached the end of its operating life. The ABWP1 team has begun engaging with the Maritime Area Regulatory Authority (MARA) and is working closely with An Coimisiún Pleanála to agree on the details of the decommissioning and removal works. Based on the fact that the ABWP1 team has commenced the pre-application process for decommissioning it is expected that ABWP1 will be fully decommissioned before commencement of operation of the Proposed Development. The construction of Mares Connect may overlap with the construction phase of the Proposed Development, and the operation of the Mares Connect may overlap with the construction and operation phases of the Proposed Development. .

Construction and Decommissioning

INJURY AND/OR DISTURBANCE FROM UNDERWATER NOISE – PILING ACTIVITIES

7.4.3.7 ~~7.5.3.8~~ The following in-combination assessment considers the River Boyne and River Blackwater SAC designated for Atlantic salmon, as well as the following sites designated for Atlantic salmon, Twaite shad, sea lamprey, river lamprey and freshwater pearl mussels:

- Slaney River Valley SAC
- River Barrow and River Nore SAC
- Lower River Suir SAC

TIER 1 PROJECTS

~~7.5.3.9 All Tier 1 projects, other than Celtix connect, will be operational at the time construction works of the Proposed Development commence. The construction of Celtix connect may overlap with the construction phase for the Proposed Development. The construction methods of Celtix connect are uncertain however may consist of a range of activities such as ploughing, trenching (via jet and/or mechanical) and Horizontal Directional Drilling (HDD). The noise produced by these activities are expected to be of a lesser magnitude and extent than that produced during piling.~~

~~7.5.3.10 **Therefore, it is concluded that there will be no AEoI from the Proposed Development in-combination with Tier 1 Projects as a result of noise generated during piling on Atlantic salmon, freshwater pearl mussels, twaite shad and lamprey from Project Design Option 1.**~~

~~7.5.3.11 **Based on the increased risk of in-combination effects of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**~~

~~TIER 3 PROJECTS~~

~~7.5.3.12 The construction of Mares connect may overlap with the construction phase for the Proposed Development. The construction methods of Mares connect are uncertain however may consist of a range of activities such as ploughing, trenching (via jet and/or mechanical) and Horizontal Directional Drilling (HDD). The noise produced by these activities are expected to be of a lesser magnitude and extent than that produced during piling.~~

~~7.5.3.13 **Therefore, it is concluded that there will be no AEoI from the Proposed Development in-combination with Tier 3 Projects as a result of noise generated during piling on Atlantic salmon, freshwater pearl mussel, twaite shad and lamprey from Project Design Option 1.**~~

7.5.3.14 **Based on the increased risk of in-combination effects of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

PHASE 1 PROJECTS

7.4.3.8 7.5.3.15 From the Phaseother offshore windfarm Tier 1 projects (Phase One projects), underwater noise will occur as a result of the installation of WTGs, and OSPs and associated cables during the construction phase of Codling Wind Park, Dublin Array and North Irish Sea Array, and during repair and maintenance activities associated with Codling Wind Park and North Irish Sea Array.

7.5.3.16 NISA. The greatest risk of cumulativein-combination impacts from underwater noise has been identified as that generated duringin the event that concurrent piling of the Proposed Development occurs along with the concurrent piling of the construction phase of the Proposed Development along with the construction phases of the Phase 1Phase One projects.

7.4.3.9 7.5.3.17 The piling during The construction phase of Codling Bank Wind Park is due to take place the year before that of piling at the Proposed Development during 2027 and piling forbetween 2026-2029, the construction phase of Dublin Array is due to take place the year after that of piling at the Proposed Development during 2029. The piling at North Irish Sea Arraybetween 2029-2032 and NISA is due to take place during the same year as that ofbetween 2027-2030. The timings of piling events are uncertain, and therefore it is assumed that the piling for these three Phase one projects may temporally overlap with the piling for the Proposed Development and therefore piling may temporally overlap. Piling operations during the construction of these Phase 1 projects are expected to be similar to that of the Proposed Development (intermittent and short-term duration)..

7.4.3.10 NISA is anticipated to involve the piling of 51 monopiles and 144 pin piles over a 9-month period, with individual piling events lasting a couple days followed by a couple days without piling (Ove Arup & Partners Ireland Limited, 2024). Dublin Array is anticipated to involve the pilling of either 45 monopiles, 39 monopiles or 50 4-leg jacket foundation pin piles, over either 57 days across a 4-month period or 125 days across a 19-month period (Kish Offshore Wind Ltd., 2025). Codling Wind Park is anticipated to involve the piling of 75 monopiles with 75 piling days (Codling Wind Park, 2024).

7.4.3.11 7.5.3.18 Mortality and mortal injuries and recoverable injuries are expected to be small in extent, with migratory fish speciesAtlantic salmon, twaite shad and lamprey being able to avoid the noise sources during soft start procedures before the onset of these effects. However, temporary TTS and behavioural effects will affect a larger number of individuals, however these species are expected to be able to fully recover between project piling operations.

7.5.3.19 The piling at North Irish Sea Array is due to take place during the same year as that of the Proposed Development and therefore piling may temporally overlap. Atlantic salmon, European eel, twaite shad and sea trout occur within the European sites assessed above, and may migrate past the Proposed Development. While these species are highly mobile and able to avoid noise sources before the onset of mortality and recoverable injuries, disruption and delay to their migration may occur as a result. Should piling at the Proposed Development and North Irish Sea Array coincide with each other, as well as coinciding with migration periods for diadromous species, the effect may be greater than that for the project alone. Furthermore, piling at all the Phase 1 projects during migratory periods could result in prolonged impacts to diadromous species (i.e. disruption to migration over several years).

7.4.3.12 7.5.3.20 Piling operations will represent intermittent occurrences at these offshore windfarm sites, with each individual piling event likely to be similar in duration to that of the Proposed Development. The total duration of piling during the construction of all Phase 1One projects is anticipated to be at most short-term (i.e., lasting one to seven years).

TWAITE SHAD

7.4.3.13 ~~7.5.3.21~~ It is considered that in-combination risks of recoverable injury or mortality of twaite shad, from piling noise would not be expected to occur as a result of the Proposed Development and these projects due to the distances between these OWFs being larger than the impact ranges (i.e. >207 dB SPL_{peak} thresholds for mortality and recoverable injury occur up to ~~340~~330 m away from ~~SW~~C monopile) ~~or there being no temporal overlap in piling events~~.

7.4.3.14 ~~7.5.3.22~~ Should piling at the Proposed Development ~~and North Irish Sea Array~~ coincide with ~~each~~piling at the other Phase One projects, as well as coinciding with migration periods for twaite shad, behavioural and TTS effects may be greater than that for the project alone. Behavioural effects are likely to consist of avoidance behaviour of the noise source, which may interfere with their migration. However, behavioural effects are likely to be short term in duration given the short term and intermittent nature of piling events.

7.4.3.15 ~~7.5.3.23~~ **In-combination risks are expected to be largely restricted to behavioural effects and are not expected to manifest at levels that would compromise the maintenance of the population. Considering the low duration and low frequency of piling events it is concluded that there will be no AEoI from the Proposed Development in-combination with the ~~Phase~~Tier 1 projects as a result of noise generated during piling on twaite shad from Project Design Option 1.**

7.4.3.16 ~~7.5.3.24~~ **Based on the ~~increased~~representative risk of in-combination effects of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

ATLANTIC SALMON

7.4.3.17 ~~7.5.3.25~~ It is considered that in-combination risks of recoverable injury or mortality of Atlantic salmon, from piling noise would not be expected to occur as a result of the Proposed Development and these projects due to the distances between these OWFs being larger than the impact ranges (i.e. >207 dB SPL_{peak} thresholds for mortality and recoverable injury occur up to ~~340~~330 m away from ~~SW~~C monopile) ~~or there being no temporal overlap in piling events~~.

7.4.3.18 ~~7.5.3.26~~ Should piling at the Proposed Development ~~and North Irish Sea Array~~ coincide with ~~each~~piling at the other Phase One projects, as well as coinciding with ~~northerly~~ migration periods for Atlantic salmon, behavioural and TTS effects may be greater than that for the project alone. Behavioural effects are likely to consist of avoidance behaviour of the noise source, which may interfere with their migration. However, behavioural effects are likely to be short term in duration given the short term and intermittent nature of piling events.

7.4.3.19 ~~7.5.3.27~~ **In-combination risks are expected to be largely restricted to behavioural effects and are not expected to manifest at levels that would compromise the maintenance of the population. Considering the low duration and low frequency of piling events it is concluded that there will be no AEoI from the Proposed Development in-combination with Phase 1 Projects as a result of noise generated during piling on Atlantic salmon from Project Design Option 1.**

7.4.3.20 ~~7.5.3.28~~ **Based on the ~~increased~~representative risk of in-combination effects of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

FRESHWATER PEARL MUSSEL

7.4.3.21 ~~7.5.3.29~~ **As it was concluded that there would be no AEoI for Atlantic salmon, the same is concluded for freshwater pearl mussels and therefore there is no AEoI on the freshwater pearl mussel ~~feature~~QI from the Proposed Development in-combination with Phase 1 Projects as a result of noise generated during piling from Project Design Option 1.**

7.4.3.22 ~~7.5.3.30~~ **Based on the ~~increased~~representative risk of in-combination effects of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

RIVER AND SEA LAMPREY

7.4.3.23 ~~7.5.3.31~~ It is considered that in-combination risks of recoverable injury or mortality of river and sea lamprey, from piling noise would not be expected to occur as a result of the Proposed Development and these projects due to the distances between these OWFs being larger than the impact ranges (i.e. >213 dB SPL_{peak} thresholds for mortality and recoverable injury occur up to ~~130~~140 m away from ~~SW~~C monopile) ~~or there being no temporal overlap in piling events~~.

7.4.3.24 ~~7.5.3.32~~ Should piling at the Proposed Development ~~and North Irish Sea Array~~ coincide with ~~each~~piling at the other Phase One projects, as well as coinciding with migration periods for lamprey, behavioural effects may be greater than that for the project alone. Behavioural effects are likely to consist of avoidance behaviour of the noise source, which may interfere with their migration. However, behavioural effects are likely to be short term in duration given the short term and intermittent nature of piling events.

7.4.3.25 ~~7.5.3.33~~ **In-combination risks are expected to be largely restricted to behavioural effects and are not expected to manifest at levels that would compromise the maintenance of the population. Considering the low duration and low frequency of piling events it is concluded that there will be no AEoI from the Proposed Development in-combination with Phase 1 Projects as a result of noise generated during piling on lamprey from Project Design Option 1.**

7.4.3.26 ~~7.5.3.34~~ **Based on the ~~increased~~representative risk of in-combination effects of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

TIER 1 AND TIER 3 PROJECTS

7.4.3.27 The construction of Rosslare Euro Port may overlap with the construction of the Proposed Development. However, underwater noise generated as a result of impact piling associated with the Rosslare Euro Port is anticipated to be restricted in extent, with project specific modelling indicating an exceedance of the peak threshold for mortality and potentially mortal injury and recoverable injury, for fish with a swim bladder (>213 dB peak, stationary receptor assumed), at 46 m (Irish Rail, 2024).

7.4.3.28 The other Tier 3 projects (decommissioning of ABWP1 and Mares Connect) are not anticipated to undertake piling, and have been considered under 'Injury and/or disturbance from underwater noise – other activities' below.

7.4.3.29 **Therefore, it is concluded that there will be no AEoI from the Proposed Development in-combination with Teir 1 and Tier 3 Projects as a result of noise generated during piling on Atlantic salmon, freshwater pearl mussel, twaite shad and lamprey from Project Design Option 1.**

7.4.3.30 **Based on the representative risk of in-combination effects of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

INJURY AND/OR DISTURBANCE FROM UNDERWATER NOISE – OTHER ACTIVITIES

7.4.3.31 ~~7.5.3.35~~ The following in-combination assessment considers the River Boyne and River Blackwater SAC designated for Atlantic salmon, as well as the following sites designated for Atlantic salmon, Twaite shad, sea lamprey, river lamprey and freshwater pearl mussels:

- Slaney River Valley SAC
- River Barrow and River Nore SAC

- Lower River Suir SAC.

TIER 1 PROJECTS

7.4.3.32 ~~7.5.3.36~~ Noise generated from continuous noise sources (e.g. vessel activity) and UXO detonation is likely to be low in extent and intermittent for both the Proposed Development and the Tier 1 projects.

7.4.3.33 ~~7.5.3.37~~ **Therefore, it is concluded that there will be no AEoI from the Proposed Development in-combination with Tier 1 Projects as a result of noise generated during piling on Atlantic salmon, freshwater pearl mussel, twaite shad and lamprey from Project Design Option 1.**

7.4.3.34 ~~7.5.3.38~~ **Based on the ~~increased~~representative risk of in-combination effects of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

TIER 1 AND TIER 3 PROJECTS

7.4.3.35 ~~7.5.3.39 The underwater~~ Noise generated from ~~activities other than piling as a result of~~continuous noise sources (e.g. vessel activity) and UXO detonation is likely to be low in extent and intermittent for both the Proposed Development and the Tier 3 projects ~~in expected to be similar or less than that of the Proposed Development~~.

7.4.3.36 ~~7.5.3.40~~ **Therefore, it is concluded that there will be no AEoI from the Proposed Development in-combination with Tier 1 and Tier 3 Projects as a result of noise generated during piling on Atlantic salmon, freshwater pearl mussel, twaite shad and lamprey from Project Design Option 1.**

7.4.3.37 ~~7.5.3.41~~ **Based on the ~~increased~~representative risk of in-combination effects of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

ACCIDENTAL POLLUTION

7.4.3.38 The following in-combination assessment considers the River Boyne and River Blackwater SAC designated for Atlantic salmon, as well as the following sites designated for Atlantic salmon, Twaite shad, sea lamprey, river lamprey and freshwater pearl mussels:

- Slaney River Valley SAC
- River Barrow and River Nore SAC
- Lower River Suir SAC

~~PHASE~~TIER 1 PROJECTS

~~7.5.3.42 Noise generated from continuous noise sources (e.g. vessel activity) and UXO detonation is likely to be low in extent and intermittent for both the Proposed Development and the Phase 1 projects.~~

7.4.3.39 Accidental release of pollutants during the construction phase of the Proposed Development and the construction and operational phases of other Tier 1 projects is predicted to be of near-field and adjacent far field extent, short-term duration (any pollutant will be quickly dispersed), infrequent and of a low likelihood of occurring.

7.4.3.40 **Therefore, it is concluded that there will be no AEoI from the Proposed Development in-combination with Tier 1 Projects as a result of accidental pollution on Atlantic salmon, freshwater pearl mussel, twaite shad and lamprey from Project Design Option 1.**

7.4.3.41 **Based on the representative risk of in-combination effects of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

TIER 1 AND TIER 3 PROJECTS

7.4.3.42 Accidental release of pollutants during the decommissioning of ABWP1, construction of Rosslare Euro Port and construction and operation of Mares Connect is predicted to be of near-field and adjacent far field extent, short-term duration (any pollutant will be quickly dispersed), infrequent and of a low likelihood of occurring.

7.4.3.43 ~~7.5.3.43~~ **Therefore, it is concluded that there will be no AEoI from the Proposed Development in-combination with ~~Phase~~Teir 1 and Tier 3 Projects as a result of ~~noise generated during piling~~accidental pollution on Atlantic salmon, freshwater pearl mussel, twaite shad and lamprey from Project Design Option 1.**

7.4.3.44 ~~7.5.3.44~~ **Based on the ~~increased~~representative risk of in-combination effects of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

Operational and Maintenance

INJURY AND/OR DISTURBANCE FROM UNDERWATER NOISE~~ – OTHER ACTIVITIES~~

7.4.3.45 ~~7.5.3.45~~ The following in-combination assessment considers the River Boyne and River Blackwater SAC designated for Atlantic salmon, as well as the following sites designated for Atlantic salmon, Twaite shad, sea lamprey, river lamprey and freshwater pearl mussels:

- Slaney River Valley SAC
- River Barrow and River Nore SAC
- Lower River Suir SAC

TIER 1 PROJECTS

7.4.3.46 ~~7.5.3.46~~ The operation of several subsea cables and OWFs overlap with the operational and maintenance phase of the Proposed Development, and the construction of Dublin Array may overlap with the operational and maintenance phase of the Proposed Development. The underwater noise generated during the operation of the Tier 1 projects is expected to be low ~~and infrequent~~.

7.4.3.47 Dublin Array is anticipated to involve the pilling of either 45 monopiles, 39 monopiles or 50 4-leg jacket foundation pin piles, over either 57 days across a 4-month period or 125 days across a 19-month period (Kish Offshore Wind Ltd., 2025). However, given there is no overlap of piling events during the operational and maintenance phase of the Proposed Development between Dublin Array and the Proposed Development and other Phase One projects, in-combination effects are not anticipated to occur.

~~7.5.3.47 Given the low extent and infrequency it is concluded that there will be no AEoI from the Proposed Development in-combination with Tier 1 Projects as a result of injury and disturbance from underwater noise from activities other than piling Atlantic salmon, twaite shad, freshwater pearl mussel and lamprey from Project Design Option 1.~~

~~7.5.3.48 Based on the increased risk of in-combination effects of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.~~

~~TIER 3 PROJECTS~~

~~7.5.3.49 The operation of Mares connect overlaps with the operational and maintenance phase of the Proposed Development. The underwater noise generated during the operation of the Tier 3 projects is expected to be low and infrequent.~~

7.4.3.48 ~~7.5.3.50~~ **Given the low extent and infrequency of underwater noise from other activities it is concluded that there will be no AEoI from the Proposed Development in-combination**

with Tier ~~3~~1 Projects as a result of injury and disturbance from underwater noise from activities other than piling Atlantic salmon, twaite shad, freshwater pearl mussel~~, twaite shad~~ and lamprey from Project Design Option 1.

7.4.3.49 ~~7.5.3.51~~ **Based on the ~~increased~~representative risk of in-combination effects of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

~~PHASE~~TEIR 1 AND TIER 3 PROJECTS

7.4.3.50 ~~7.5.3.52 The impact during~~A temporal overlap between the operational and maintenance ~~phases~~phase of the Proposed Development ~~and the Phase 1 projects is expected to be low in extent, long term and continuous in the case of WTGs and short term and infrequent in the case of noise generated by vessels during repair activities.~~with the decommissioning of ABWP1 is not anticipated, and underwater noise generated during the operation of Rosslare Euro Port and Mares Connect is anticipated to be minimal.

7.4.3.51 ~~7.5.3.53~~ **Given the ~~low extent and/or infrequency~~lack of a temporal overlap it is concluded that there will be no AEoI from the Proposed Development in-combination with ~~Phase~~Tier 1 and Tier 3 Projects as a result of injury and disturbance from underwater noise from activities other than piling Atlantic salmon, freshwater pearl mussel, twaite shad and lamprey from Project Design Option 1.**

7.4.3.52 ~~7.5.3.54~~ **Based on the ~~increased~~representative risk of in-combination effects of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

CHANGES IN EMF

7.4.3.53 ~~7.5.3.55~~ The following in-combination assessment considers the River Boyne and River Blackwater SAC designated for Atlantic salmon, as well as the following sites designated for Atlantic salmon, Twaite shad, sea lamprey, river lamprey and freshwater pearl mussels:

- Slaney River Valley SAC
- River Barrow and River Nore SAC
- Lower River Suir SAC

TIER 1 PROJECTS

7.4.3.54 ~~7.5.3.56~~ EMF ~~affects~~effects associated with the Tier 1 projects are expected to be highly localised and restricted to ~~discrete areas within the proposed development areas (~~areas immediately surrounding energised subsea power cables and telecommunications cables (e.g. export cables, inter-array cables and interconnector cables), Typically within metres of the cables). As such, EMF effects from Tier 1 projects will be spatially limited to the immediate vicinity of these cables. Given the highly localised nature of EMF emissions and the typical burial of cables within the seabed, the potential for overlap of EMF fields between projects is considered unlikely.

7.4.3.55 ~~7.5.3.57~~ **Given the highly localised nature of EMF effects it is concluded that there will be no AEoI from the Proposed Development in-combination with Tier 1 Projects on Atlantic salmon, freshwater pearl mussel, twaite shad and lamprey from Project Design Option 1.**

7.4.3.56 ~~7.5.3.58~~ **Based on the ~~increased~~representative risk of in-combination effects of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

TIER 1 AND TIER 3 PROJECTS

7.4.3.57 ~~7.5.3.59~~ EMF ~~affects~~effects associated with ~~Mares connect~~Tier 1 and Tier 3 projects are expected to be highly localised and restricted to ~~discrete areas within the proposed development area~~

(areas immediately surrounding energised subsea cables (e.g. HDVC interconnector cables), typically within metres of the cables).

7.4.3.58 ~~7.5.3.60~~ **~~Given the highly localised nature of EMF effects~~ It is concluded that there will be no AEoI from the Proposed Development in-combination with Tier 1 and Tier 3 Projects on Atlantic salmon, freshwater pearl mussel, twaite shad and lamprey from Project Design Option 1.**

7.4.3.59 ~~7.5.3.61~~ **Based on the ~~increased~~representative risk of in-combination effects of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

ACCIDENTAL POLLUTION

7.4.3.60 The following in-combination assessment considers the River Boyne and River Blackwater SAC designated for Atlantic salmon, as well as the following sites designated for Atlantic salmon, Twaite shad, sea lamprey, river lamprey and freshwater pearl mussels:

- Slaney River Valley SAC
- River Barrow and River Nore SAC
- Lower River Suir SAC

~~PHASE~~TIER 1 PROJECTS

~~7.5.3.62 From the Phase 1 projects, EMFs may be emitted by cables associated with ABWP1, Codling Wind Park, Dublin Array and North Irish Sea Array. Given the similarity in project designs, EMF affects associated with the other Tier 2 projects are expected to be highly localised and restricted to discrete areas within the proposed development areas (within metres of the cables).~~

7.4.3.61 Accidental release of pollutants during the operational and maintenance phase of the Proposed Development and the operation of the Tier 1 projects and construction of Dublin Array is predicted to be of near-field and adjacent far field extent, short-term duration (any pollutant will be quickly dispersed), infrequent and have a low likelihood of occurring.

7.4.3.62 ~~7.5.3.63~~ **~~Given the highly localised nature of EMF effects~~Therefore, it is concluded that there will be no AEoI from the Proposed Development in-combination with ~~Phase~~Tier 1 Projects as a result of accidental pollution on Atlantic salmon, freshwater pearl mussel, twaite shad and lamprey from Project Design Option 1.**

7.4.3.63 **Based on the representative risk of in-combination effects of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

TIER 1 AND TIER 3 PROJECTS

7.4.3.64 A temporal overlap between the operational and maintenance phase of the Proposed Development with the decommissioning of ABWP1 is not anticipated, and operational activities associated with Rosslare Euro Port and Mares Connect are anticipated to be minimal, with any impact being of near-field and adjacent far field extent, short-term duration (any pollutant will be quickly dispersed), infrequent and have a low likelihood of occurring

7.4.3.65 **Therefore, it is concluded that there will be no AEoI from the Proposed Development in-combination with Tier 1 and Tier 3 Projects as a result of accidental pollution on Atlantic salmon, freshwater pearl mussel, twaite shad and lamprey from Project Design Option 1.**

7.4.3.66 ~~7.5.3.64~~ **Based on the ~~increased~~representative risk of in-combination effects of Project Design Option 1, it is concluded that no AEoI would also apply to Project Design Option 2.**

7.4.4 ~~7.5.4~~ Intertidal and Offshore Ornithology Receptors

7.4.4.1 ~~7.5.4.1~~ The in-combination offshore ornithology assessment has considered the same potential impacts, SPAs and features screened in for assessment of the Proposed Development alone (Section 6.8). The additional Plans and Projects considered are listed in Table 7.5.

Howth Head Coast SPA

COLLISION RISK

KITTIWAKE

7.4.4.2 ~~7.5.4.2~~ Assessment of the Project alone impact (paragraph 6.8.1.1 *et seq.*) concluded there would be no AEoI on the Howth Head Coast SPA, and that the impact was comfortably below the threshold at which any effects could be distinguished from natural background variations (Parker *et al.* 2022). Plans or Projects which have no appreciable effect on a site are considered excluded as any effects, if there are any at all, are entirely negligible[~~2~~10]. Therefore, there is no requirement to undertake an in-combination assessment for this feature.

Ireland's Eye SPA

COLLISION RISK

KITTIWAKE

7.4.4.3 ~~7.5.4.3~~ Assessment of the Project alone impact (paragraph 6.8.2.1 *et seq.*) concluded there would be no AEoI on the Ireland's Eye SPA, and that the impact was comfortably below the threshold at which any effects could be distinguished from natural background variations (Parker *et al.* 2022). Plans or Projects which have no appreciable effect on a site are considered excluded as any effects, if there are any at all, are entirely negligible[~~2~~10]. Therefore, there is no requirement to undertake an in-combination assessment for this feature.

HERRING GULL

7.4.4.4 ~~7.5.4.4~~ Assessment of the Project alone impact (paragraph ~~6.8.2.14~~6.8.2.14 *et seq.*) concluded there would be no AEoI on the Ireland's Eye SPA, and that the impact was comfortably below the threshold at which any effects could be distinguished from natural background variations (Parker *et al.* 2022). Plans or Projects which have no appreciable effect on a site are considered excluded as any effects, if there are any at all, are entirely negligible[~~2~~10]. Therefore, there is no requirement to undertake an in-combination assessment for this feature.

DISPLACEMENT

GUILLEMOT

7.4.4.5 ~~7.5.4.5~~ Assessment of the Project alone impact (paragraph ~~6.8.2.24~~6.8.2.24 *et seq.*) concluded there would be no AEoI on the Ireland's Eye SPA, and that the impact was comfortably below the threshold at which any effects could be distinguished from natural background variations (Parker *et al.* 2022). Plans or Projects which have no appreciable effect on a site are considered excluded

[~~2~~10] https://curia.europa.eu/juris/document/document.jsf?text=&docid=130253&doclang=EN

as any effects, if there are any at all, are entirely negligible~~2~~10. Therefore, there is no requirement to undertake an in-combination assessment for this feature.

RAZORBILL

7.4.4.6 ~~7.5.4.6~~ Assessment of the Project alone impact (paragraph ~~6.8.2.50~~6.8.2.50 *et seq.*) concluded there would be no AEoI on the Ireland's Eye SPA, and that the impact was comfortably below the threshold at which any effects could be distinguished from natural background variations (Parker *et al.* 2022). Plans or Projects which have no appreciable effect on a site are considered excluded as any effects, if there are any at all, are entirely negligible~~2~~10. Therefore, there is no requirement to undertake an in-combination assessment for this feature.

Lambay Island SPA

COLLISION RISK

KITTIWAKE

7.4.4.7 ~~7.5.4.7~~ Assessment of the Project alone impact (paragraph 6.8.3.1 *et seq.*) concluded there would be no AEoI on the Lambay Island SPA, and that the impact was comfortably below the threshold at which any effects could be distinguished from natural background variations (Parker *et al.* 2022). Plans or Projects which have no appreciable effect on a site are considered excluded as any effects, if there are any at all, are entirely negligible~~2~~10. Therefore, there is no requirement to undertake an in-combination assessment for this feature.

HERRING GULL

7.4.4.8 ~~7.5.4.8~~ Assessment of the Project alone impact (paragraph ~~6.8.3.14~~6.8.3.14 *et seq.*) concluded there would be no AEoI on the Lambay Island SPA, and that the impact was comfortably below the threshold at which any effects could be distinguished from natural background variations (Parker *et al.* 2022). Plans or Projects which have no appreciable effect on a site are considered excluded as any effects, if there are any at all, are entirely negligible~~2~~10. Therefore, there is no requirement to undertake an in-combination assessment for this feature.

LESSER BLACK-BACKED GULL

7.4.4.9 ~~7.5.4.9~~ Assessment of the Project alone impact (paragraph ~~6.8.3.23~~6.8.3.23 *et seq.*) concluded there would be no AEoI on the Lambay Island SPA, and that the impact was comfortably below the threshold at which any effects could be distinguished from natural background variations (Parker *et al.* 2022). Plans or Projects which have no appreciable effect on a site are considered excluded as any effects, if there are any at all, are entirely negligible~~2~~10. Therefore, there is no requirement to undertake an in-combination assessment for this feature.

DISPLACEMENT

GUILLEMOT

7.4.4.10 ~~7.5.4.10~~ Assessment of the Project alone impact (paragraph ~~6.8.3.32~~6.8.3.32 *et seq.*) concluded there would be no AEoI on the Lambay Island SPA, and that the impact was comfortably below the threshold at which any effects could be distinguished from natural background variations (Parker *et al.* 2022). Plans or Projects which have no appreciable effect on a site are considered excluded as any effects, if there are any at all, are entirely negligible~~2~~10. Therefore, there is no requirement to undertake an in-combination assessment for this feature.

RAZORBILL

7.4.4.11 ~~7.5.4.11~~ Assessment of the Project alone impact (paragraph ~~6.8.3.51~~6.8.3.51 *et seq.*) concluded there would be no AEoI on the Lambay Island SPA, and that the impact was comfortably below the threshold at which any effects could be distinguished from natural background variations (Parker *et al.* 2022). Plans or Projects which have no appreciable effect on a site are considered excluded as any effects, if there are any at all, are entirely negligible~~2~~10. Therefore, there is no requirement to undertake an in-combination assessment for this feature.

Saltee Islands SPA

COLLISION RISK

KITTIWAKE

7.4.4.12 ~~7.5.4.12~~ Assessment of the Project alone impact (paragraph 6.8.4.1 *et seq.*) concluded there would be no AEoI on the Saltee Islands SPA, and that the impact was comfortably below the threshold at which any effects could be distinguished from natural background variations (Parker *et al.* 2022). Plans or Projects which have no appreciable effect on a site are considered excluded as any effects, if there are any at all, are entirely negligible~~2~~10. Therefore, there is no requirement to undertake an in-combination assessment for this feature.

GANNET

7.4.4.13 ~~7.5.4.13~~ Assessment of the Project alone impact (paragraph ~~6.8.4.14~~6.8.4.14 *et seq.*) concluded there would be no AEoI on the Saltee Islands SPA, and that the impact was comfortably below the threshold at which any effects could be distinguished from natural background variations (Parker *et al.* 2022). Plans or Projects which have no appreciable effect on a site are considered excluded as any effects, if there are any at all, are entirely negligible~~2~~10. Therefore, there is no requirement to undertake an in-combination assessment for this feature.

HERRING GULL

7.4.4.14 ~~7.5.4.14~~ Assessment of the Project alone impact (paragraph ~~6.8.4.29~~6.8.4.29 *et seq.*) concluded there would be no AEoI on the Saltee Islands SPA, and that the impact was comfortably below the threshold at which any effects could be distinguished from natural background variations (Parker *et al.* 2022). Plans or Projects which have no appreciable effect on a site are considered excluded as any effects, if there are any at all, are entirely negligible~~2~~10. Therefore, there is no requirement to undertake an in-combination assessment for this feature.

LESSER BLACK-BACKED GULL

7.4.4.15 ~~7.5.4.15~~ Assessment of the Project alone impact (paragraph ~~6.8.4.38~~6.8.4.38 *et seq.*) concluded there would be no AEoI on the Saltee Islands SPA, and that the impact was comfortably below the threshold at which any effects could be distinguished from natural background variations (Parker *et al.* 2022). Plans or Projects which have no appreciable effect on a site are considered excluded as any effects, if there are any at all, are entirely negligible~~2~~10. Therefore, there is no requirement to undertake an in-combination assessment for this feature.

DISPLACEMENT

GUILLEMOT

7.4.4.16 ~~7.5.4.16~~ Assessment of the Project alone impact (paragraph ~~6.8.4.46~~6.8.4.46 *et seq.*) concluded there would be no AEoI on the Saltee Islands SPA, and that the impact was comfortably below

the threshold at which any effects could be distinguished from natural background variations (Parker *et al.* 2022). Plans or Projects which have no appreciable effect on a site are considered excluded as any effects, if there are any at all, are entirely negligible~~2~~10. Therefore, there is no requirement to undertake an in-combination assessment for this feature.

RAZORBILL

7.4.4.17 ~~7.5.4.17~~ Assessment of the Project alone impact (paragraph ~~6.8.4.66~~6.8.4.66 *et seq.*) concluded there would be no AEoI on the Saltee Islands SPA, and that the impact was comfortably below the threshold at which any effects could be distinguished from natural background variations (Parker *et al.* 2022). Plans or Projects which have no appreciable effect on a site are considered excluded as any effects, if there are any at all, are entirely negligible~~2~~10. Therefore, there is no requirement to undertake an in-combination assessment for this feature.

Skerries Islands SPA

COLLISION RISK

HERRING GULL

7.4.4.18 ~~7.5.4.18~~ Assessment of the Project alone impact (section 6.8.5) concluded there would be no AEoI on the Skerries Islands SPA, and that the impact was comfortably below the threshold at which any effects could be distinguished from natural background variations (Parker et al. 2022). Plans or Projects which have no appreciable effect on a site are considered excluded as any effects, if there are any at all, are entirely negligible~~2~~10. Therefore, there is no requirement to undertake an in-combination assessment for this feature.

The Murrough SPA

REDISTRIBUTION OF SCI WITHIN THE SPA

RED-THROATED DIVER

7.4.4.19 Assessment of the Project alone impact (section 6.8.6) concluded there would be no AEoI on the Murrough SPA, and that the impact was comfortably below the threshold at which any effects could be distinguished from natural background variations (Parker et al. 2022). Plans or Projects which have no appreciable effect on a site are considered excluded as any effects, if there are any at all, are entirely negligible. Therefore, there is no requirement to undertake an in-combination assessment for this feature.

Wicklow Head SPA

COLLISION RISK

KITTIWAKE

7.4.4.20 ~~7.5.4.19~~ Assessment of the Project alone impact (section ~~6.8.7~~6.8.7) concluded there would be no AEoI on the Wicklow Head SPA. However, the ~~impact~~upper end of the range of impacts was estimated to be slightly above the threshold at which any effects could be distinguished from natural background variations (Parker *et al.* 2022). Therefore, since there is potential for the Project Alone effect to contribute to an in-combination effect on this feature, it is appropriate to undertake an in-combination assessment.

7.4.4.21 ~~7.5.4.20~~ For ~~Irish~~the Phase 1 ~~windfarms~~projects seasonal collision estimates are available, however for UK Irish Sea windfarms only annual estimates were available. Since all the UK Irish Sea windfarms are at least 150 km from the SPA, it has been assumed that kittiwakes from Wicklow Head SPA would only have the potential to be present in the nonbreeding season. Thus, for UK Irish Sea windfarms the nonbreeding season percentages estimated for Wicklow Head SPA of between 0.19% to 0.37% ~~(paragraph 6.8.7.7)~~ were applied. These gave UK windfarm apportioned collisions of ~~1.1 to 2.2 (**Error! Unknown switch argument.**~~0.7 to 1.4 (Table 7.610).

7.4.4.22 ~~7.5.4.21~~ The ~~Phase 1~~ annual total collisions for all Phase 1 projects including the Proposed Development apportioned to the SPA was estimated to be ~~7.2-7.8 (**Error! Unknown switch argument.**~~2.6 - 2.8 (Table 7.610). Summing the Phase 1 and UK Irish Sea windfarm totals gives a combined total of between ~~8.0 to 9.4~~3.3 to 4.2 collisions per year apportioned to the Wicklow Head SPA.

7.4.4.23 ~~7.5.4.22~~ The background adult mortality rate for kittiwake is 0.146 (Horswill and Robinson 2015), which indicates that the natural mortality for the SPA population using the ~~most recent~~2024 count (~~773~~851 AON~~, Cummins *et al.*, 2019~~; NIS Volume III, Appendix 12.16: Wicklow Head Seabird Monitoring (RFI March 2026)) would be ~~226~~248. Addition of ~~8.0~~3.3 to ~~9.4~~4.2 adults to these would increase the background rate of the designated population by ~~3.5~~1.3% to ~~4.1%.~~1.7% (although in 2025 a count of 1.077 AON was made, which would reduce these increases in background mortality to 1.05% and 1.3% respectively). The threshold below which increases in background mortality are considered to be undetectable against natural variations is 1% (Parker *et al.* 2022). Therefore, additional consideration of the potential impact on the SPA population has been undertaken using the results from a kittiwake population model of the Wicklow Head SPA population (Volume III, Technical Appendix 12.10 Offshore Ornithology: Kittiwake Population Viability Analysis).

Table 7.~~6~~10: In-combination annual collision risk for kittiwake using the highest collision predictions for Project Design Option 1b, and the mortality apportioned to the Wicklow Head SPA

Windfarm	Breeding season		Nonbreeding season		Annual	
	Total	SPA	Total	SPA	Total	SPA
Awel-y-Mor	-	-	-	-	~~53.9~~34.3	
Gwynt y Mor	-	-	-	-	-	
Rhyl Flats	-	-	-	-	-	
Burbo Bank Extension	-	-	-	-	22.3	
North Hoyle	-	-	-	-	-	
Walney Extension 3 + 4	-	-	-	-	~~187.6~~11 7.0	
West of Duddon Sands	-	-	-	-	-	
Walney 1 + 2	-	-	-	-	-	
Burbo Bank	-	-	-	-	-	
Ormonde	-	-	-	-	2.2	

Windfarm	Breeding season		Nonbreeding season		Annual	
	Total	SPA	Total	SPA	Total	SPA
Barrow	-	-	-	-	-	
Robin Rigg	-	-	-	-	-	
ABWP1	-	-	-	-	-	
Twin Hub	-	-	-	-	~~10.8~~9.5	
White Cross	-	-	-	-	13.7	
Erebus	-	-	-	-	58.0	
Morgan	-	-	-	-	39.8	
Morecambe	-	-	-	-	32.0	
Mona	-	-	-	-	37.1	
~~Total UK~~Llyr 1	-	-	-	-	~~443.6~~23.9	~~0.8-1.6~~
~~Phase 1 Projects~~**Total UK**	~~56.1-~~	-	~~134.1-~~	-	~~190.3~~**389.8**	~~1.3~~**0.74-1.44**
NISA	5.4	0.02	13.9	0.03	19.3	0.05
Oriel	4	0	43.8	0	47.8	0
Codling	4.2	0.01	14.0	0.56	18.2	0.57
Dublin Array	13.6	0.34	16.0	0.03	29.6	0.38
Proposed Development –Project Design Option 1a	~~16.7~~5.0	~~5.1~~1.5	~~170.1~~25.3	~~0.6~~0.10	~~186.8~~30.3	~~5.7~~1.6
Proposed Development –Project Design Option 1b	~~18.8~~5.8	~~5.8~~1.7	~~190.2~~28.7	~~0.7~~0.12	~~209.1~~34.5	~~6.5~~1.8
Proposed Development – Project Design Option 2	~~16.8~~5.6	~~5.1~~1.7	~~171.9~~27.6	~~0.6~~0.11	~~188.8~~33.1	~~5.7~~1.8
Total Ireland	~~72.8-74.9~~**32.2-33**	**1.87-2.07**	~~304.2–324.3~~**113-116.4**	**0.72-0.744**	~~377.1-399.4~~**145.2-149.4**	~~7.0-7.8~~**2.6-2.8**
Total Ireland and UK	~~72.8-74.9~~**32.2-33**	**1.87-2.07**	~~304.2 – 324.3~~**113-116.4**	**0.72-0.74**	~~820.7-843.0~~**497.4-501.6**	~~7.8-9.4~~**3.34-4.24**

7.4.4.24 ~~7.5.4.23~~ The model results, presented as comparisons of the predicted population size and population growth rate between unimpacted (baseline) model runs and impacted ones, presented

as proportions and referred to as counterfactuals: CPS (counterfactual of population size) and CPGR (counterfactual of population growth rate), are provided in ~~Error! Unknown switch argument.~~Table 7.711.

Table 7.~~7~~11: Summary outputs from Wicklow Head SPA kittiwake population model, mean values (and 95% confidence intervals)

Impact magnitude (annual adult collisions)	Model type	Counterfactual of population size (CPS)	Counterfactual of population growth rate (CPGR)
~~8~~3	Density independent	~~0.8306 (0.7096 – 0.9669~~0.9311 (0.7870-1.0970)	~~0.9941 (0.9897 – 0.9983~~0.9978 (0.9929-1.0025)
	Density dependent	~~0.9365 (0.8706 – 1.0051~~0.9760 (0.9068-1.0471)	~~0.9979 (0.9949 – 1.0008~~0.9992 (0.9962-1.0022)
~~9~~4	Density independent	~~0.8065 (0.6986 – 0.9429~~0.9100 (0.7671 – 1.074)	~~0.9934 (0.9893 – 0.9976~~0.9971 (0.9921-1.0018)
	Density dependent	~~0.9285 (0.8613 – 0.9954~~0.9677 (0.9007 - 1.0388)	~~0.9976 (0.9946 – 1.0005~~0.999 (0.996 – 1.0019)
~~10~~5	Density independent	~~0.7901 (0.6831 – 0.9180~~0.8877 (0.7674-1.0325)	~~0.9926 (0.9884 – 0.9969~~0.9963 (0.9921-1.0006)
	Density dependent	~~0.9196 (0.8554 – 0.9868~~0.9598 (0.8927 - 1.0293)	~~0.9974 (0.9944 – 1.0002~~0.9998 (0.9987-1.0017)

7.4.4.25 ~~7.5.4.24~~ The first aspect to note is that the density dependent ~~the~~ 95% confidence intervals ~~at the lower~~for annual mortality ~~(8)~~ for both the CPS (counterfactual of population size) and CPGR (counterfactual of ~~population~~populations growth rate) for all of the 12 results presented include 1.0. Therefore, none of these ~~outcomes~~results would ~~not~~ be considered to indicate a statistically significant effect.

7.4.4.26 ~~7.5.4.25~~ The CPGR for the density independent models indicates that the growth rate would be reduced by no more than ~~0.74% (0.9926~~0.37% (0.9963 at a mortality of 5) and the population (CPS from the density dependent model) would be reduced by no more than ~~8~~4.0% (~~0.9196~~0.9598). The latter ~~(density dependent)~~ would indicate the number of pairs, after 36.5 years, might be reduced from ~~773~~850 AON to ~~711~~816 AON, while the former (density independent) suggests there might be a small reduction in the ~~long term~~long-term growth rate from ~~0.992~~1.005 to ~~0.985~~1.001 (=~~0.992~~1.005 x ~~0.9926~~0.9963).

7.4.4.27 ~~7.5.4.26~~ As noted above (section ~~6.8.7.11~~6.8.7.11), while the strength and form of density dependence in kittiwake populations is not fully understood, there is strong evidence for density dependence acting on kittiwake populations in terms of their competition for food around the colony (Furness and Birkhead, 1984; Ford *et al.*, 2007, Wakefield *et al.*, 2017), and in terms of colony growth and net immigration rates (Coulson 2011; Miller *et al.*, 2019). There is also strong evidence that kittiwake colonies form a meta-population with high levels of immigration of young birds into colonies (Coulson, 2011). That flow of immigrant birds will also tend to reduce the assessed impact of additional mortality at the focal colony compared with population models (such as used here) that assume each SPA population to be a closed population (Miller *et al.*, 2019). Therefore, the prediction that the population size would be ~~8~~4.0% smaller (~~0.9196~~0.9598) than it would otherwise have been without the additional mortality, is considered to represent a more reliable guide to the level of potential impact on the population.

7.4.4.28 ~~7.5.4.27~~ It is also important to note however, that offshore windfarm collision risk assessments include several sources of precaution in the input parameters used and that the magnitude of impact predicted here is very likely to over-estimate the true impacts. If accounting for this over-precaution reduced predicted collisions to around ~~2~~2.5 per year, then the predicted effect on the population would increase background mortality by less than 1% and consequently be considered undetectable (Parker *et al.* 2022).

7.4.4.29 ~~7.5.4.28~~ In view of the predicted small effects on the population status, it is concluded that the population dynamics of the species indicate that any additional mortality due to the Proposed Development will not materially affect the population's ability to maintain itself on a long-term basis as a viable component of its natural habitats; the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

7.4.4.30 ~~7.5.4.29~~ **Overall, therefore, on the basis of the precautionary impact predictions and PVA results it is concluded beyond reasonable scientific doubt that there will be no AEoI of the Wicklow Head SPA from collision effects on kittiwake due to the Proposed Development in-combination with other plans and projects.**

8 Conclusion of Stage 2 Appraisal

8.1.1.1 The Stage 2 Appropriate Assessment of implications for European sites in light of their COs was completed in compliance with EU and Irish law and relevant European Commission and national guidelines to determine whether or not AEoI of any European site would occur as a result of the construction, operational and maintenance, or decommissioning of the Proposed Development.

8.1.1.2 This NIS has been prepared to inform and to enable the competent authority to determine if the Proposed Development, individually or in-combination with any other plans or projects will have AEoI on any European site when they are undertaking an AA.

8.1.1.3 Having considered site specific surveys, scientific investigations, and assessments, which are set out in the NIS and its appendices, in the light of the best scientific knowledge in the field, all aspects of the Proposed Development which, by itself, or in combination with other plans or projects, may affect the relevant European Sites have been considered.

8.1.1.4 This NIS contains information which the relevant public authority, as competent authority, must consider in making its own complete, precise and definitive findings and conclusions and upon which the relevant public authority is capable of determining that all reasonable scientific doubt has been removed as to the effects of the Proposed Development on the integrity of the relevant European sites.

8.1.1.5 **In light of the conclusions of the assessment conducted in this NIS, the authors are of the view that the construction, operational and maintenance, and decommissioning of the Proposed Development, alone and in-combination with other plans or projects, will not ~~adversely affect the integrity of~~have any AEoI on any European site.**

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~~10 Appendix~~Annex I ~~Descriptions~~Long List of Projects and Plans ~~included~~with Screening Decisions for Inclusion in the In-Combination Assessment

~~Project/Plan~~	~~Status~~	~~Closest Distance from the Proposed Development (km)~~	~~Description of Project/Plan~~	~~Dates of construction (if applicable)~~	~~Dates of operation (if applicable)~~	~~Overlap with the Proposed Development~~
~~Tier 1 – Other Arklow Bank Wind Park 2 Developments~~						
~~Arklow Bank Wind Park 2 Onshore Grid Infrastructure~~	~~Proposed~~	~~0.0~~	~~Development of the onshore grid infrastructure.~~	~~2026 to 2030~~	~~2030 to 2066~~	~~Screened out due to no pathway with offshore ornithology receptors~~
~~Arklow Bank Wind Park 2 OMF Onshore Infrastructure~~	~~Proposed~~	~~4.5~~	~~Development of an OMF to support the Proposed Development, located at Arklow Port.~~	~~2026 to 2029~~	~~2030 to 2066~~	~~Screened out due to no pathway with offshore ornithology receptors~~
~~Arklow Bank Wind Park 2 OMF Nearshore Infrastructure~~	~~Proposed~~	~~4.5~~	~~Development of an OMF to support the Proposed Development, located at Arklow Port.~~	~~2026 to 2029~~	~~2030 to 2066~~	~~Screened out due to no pathway with offshore ornithology receptors~~
~~EirGrid Grid Upgrade Works~~	~~Proposed~~	~~2.9~~	~~Grid upgrade works including a new 220 kV substation at Ballybeg and the stringing of new conductors on the currently unused side of 220 kV pylons between the~~	~~2023 to 2029~~	~~2029 to 2074~~	~~Screened out due to no pathway with offshore ornithology receptors~~

Project/Plan	Status	Closest Distance from the Proposed Development (km)	Description of Project/Plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Proposed Development
			proposed Arklow Bank Wind Park Phase 2 OGI substation and the existing Arklow 220 kV substation			
Irish Water Upgrade Works	Proposed	4.2	Upgrade of 2.3 km of 2inch watermain to 100 mm from Arklow Town in a north-westerly direction towards Shelton Abbey.	2026-2029	In perpetuity	Screened out due to no pathway with offshore ornithology receptors
Development to the south of South Quay Arklow- ABWP2 Operations and Maintenance Facility (OMF)	Approved	4.3	Relates to ABWP2. As part of the works, a pontoon is proposed along with up to 4 cranes for loading and unloading of vessels. Additionally, dredging of approximately 6,000 m^3 of material from the nearshore is also proposed, to provide for navigational depth, berthing area and manoeuvring area for vessels.	2026-2033	2034 onwards	Temporal overlap of construction and operational phases with the Proposed Development construction and Operational and Maintenance phases.
Tier 2 – Offshore Windfarms						
Arklow Bank Wind Park 1	Operational	0	Arklow Bank Wind Park 1, consisting of seven wind turbines at a capacity of 25.2 MW.	2003 to 2004	2004 to ongoing	Screened in due to ongoing impact. Located within the Array Area.
Arklow Flood Relief Scheme	Conditionally approved	4.01	Wicklow County Council, funded by the Office of Public Works (OPW), proposes to undertake engineering works along the Avoca River and	2024 - 2028	2028 - ongoing	Potential for temporal overlap with Proposed Development construction phase.

Project/Plan	Status	Closest Distance from the Proposed Development (km)	Description of Project/Plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Proposed Development
			surrounds to mitigate the risk of flooding in the Arklow town area in County Wicklow. Proposed works include dredging, installation of flood defence embankments/ walls and gravel/ debris traps.			
Codling Wind Park (formerly known as Codling I and Codling II)	Proposed	10.2	'Relevant Project'. Updated application expected to be made under the Marine Planning and Development Management (MPDM) regime. Scoping Report indicates up to 140 wind turbines and up to five OSPs (CWP, 2020).	Unknown	Unknown	Potential for overlap with Proposed Development construction and Operational and Maintenance phases.
Dublin Array (formerly known as Bray and Kish Offshore Windfarms)	Proposed	25.8	'Relevant Project'. Updated application expected to be made under the MPDM regime. Scoping Report indicates up to 61 wind turbines with up to 308 m tip height and indicative hub height of 165.5 m above mean high water springs (Innogy, 2020).	Unknown	Unknown	Potential for overlap with Proposed Development construction and Operational and Maintenance phases.
North Irish Sea Array	Proposed	65	'Relevant Project'. Updated application expected to be made under the MPDM regime.	Unknown	Unknown	Potential for overlap with Proposed Development construction and Operational and Maintenance phases.
Oriel Wind Park	Proposed	108.1	'Relevant Project'. Updated application expected to be made under the MPDM regime.	Unknown	Unknown	Potential for overlap with Proposed Development construction and Operational and Maintenance phases.

Project/Plan	Status	Closest Distance from the Proposed Development (km)	Description of Project/Plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Proposed Development
Erebus Offshore Windfarm	Consented	142	Consented for up to 7 turbines	N/A	N/A	Potential for overlap with Proposed Development construction and Operational and Maintenance phases
Valorous Offshore Windfarm	Proposed	142	Early-stage planning	N/A	N/A	Potential overlap of Operational and Maintenance phases.
Awel y Mor Offshore Windfarm	Consented	152	Consented for up to 50 turbines	N/A	N/A	Potential for overlap with Proposed Development construction and Operational and Maintenance phases
Rhyl Flats	Operational	156	Operational windfarm comprising 25 turbines	N/A	2009 – ongoing	Screened in due to ongoing impact. Located within Irish Sea with potential to contribute to impacts on regional seabird populations
Mona Offshore Windfarm	Proposed	158	English Round 4 project with up to 107 turbines	N/A	N/A	Potential for overlap with Proposed Development construction and Operational and Maintenance phases
Gwynt y Mor Offshore Windfarm	Operational	159	Operational windfarm comprising 160 turbines	N/A	2015 – ongoing	Screened in due to ongoing impact. Located within Irish Sea with potential to contribute to

Project/Plan	Status	Closest Distance from the Proposed Development (km)	Description of Project/Plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Proposed Development
						impacts on regional seabird populations
North Hoyle	Operational	170	Operational windfarm comprising 30 turbines	N/A	2003 – ongoing	Screened in due to ongoing impact. Located within Irish Sea with potential to contribute to impacts on regional seabird populations
Morgan Offshore Windfarm	Proposed	181	English Round 4 project with up to 96 turbines	N/A	N/A	Potential for overlap with Proposed Development construction and Operational and Maintenance phases
Walney Extension	Operational	187	Operational windfarm comprising 47 turbines	N/A	2018 – ongoing	Screened in due to ongoing impact. Located within Irish Sea with potential to contribute to impacts on regional seabird populations
Burbo Bank	Operational	189	Operational windfarm comprising 25 turbines	N/A	2007 – ongoing	Screened in due to ongoing impact. Located within Irish Sea with potential to contribute to impacts on regional seabird populations
Burbo Bank Extension	Operational	181	Operational windfarm comprising 32 turbines	N/A	2017- ongoing	Screened in due to ongoing impact. Located within Irish Sea with

Project/Plan	Status	Closest Distance from the Proposed Development (km)	Description of Project/Plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Proposed Development
						potential to contribute to impacts on regional seabird populations
Morecambe Offshore Windfarm	Proposed	189	English Round 4 project with up to 40 turbines	N/A	N/A	Potential for overlap with Proposed Development construction and Operational and Maintenance phases
Robin Rigg Offshore Windfarm	Operational	275	Operational windfarm comprising 58 turbines	N/A	2010 – ongoing	Screened in due to ongoing impact. Located within Irish Sea with potential to contribute to impacts on regional seabird populations
West of Duddon Sands Offshore Windfarm	Operational	196	Operational windfarm comprising 108 turbines	N/A	2014 – ongoing	Screened in due to ongoing impact. Located within Irish Sea with potential to contribute to impacts on regional seabird populations
Walney Offshore Windfarm	Operational	197	Operational windfarm comprising 102 turbines	N/A	2010 – ongoing	Screened in due to ongoing impact. Located within Irish Sea with potential to contribute to impacts on regional seabird populations
Ormonde	Operational	207	Operational windfarm comprising 30 turbines	N/A	2012 – ongoing	Screened in due to ongoing impact. Located

Project/Plan	Status	Closest Distance from the Proposed Development (km)	Description of Project/Plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Proposed Development
						within Irish Sea with potential to contribute to impacts on regional seabird populations
Barrow Offshore Windfarm	Operational	208	Operational windfarm comprising 30 turbines	N/A	2006 to ongoing	Screened in due to ongoing impact. Located within Irish Sea with potential to contribute to impacts on regional seabird populations
Twin Hub Offshore Windfarm	Consented	296	Floating test site with 4 turbines	N/A	N/A	Potential for overlap with Proposed Development construction and Operational and Maintenance phases.
Tier 3 – Other Plans and Projects						
Arklow Bank Wind Park 1 Power Cable	Operational	0.0	Power	Complete	Ongoing	Temporal overlap of operational phase with the Proposed Development construction and Operational and Maintenance phases
Arklow Waste Water	Construction	3.4	Arklow Waste Water Treatment Plant	2021-2024	2025 onwards	Temporal overlap of operational phase with the Proposed Development

Project/Plan	Status	Closest Distance from the Proposed Development (km)	Description of Project/Plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Proposed Development
Treatment Plant						construction and Operational and Maintenance phases.
Irish Mussel Seed Company Ltd.	Operational	5.3	Aquaculture	Complete	Ongoing	Temporal overlap of operational phase with the Proposed Development construction and Operational and Maintenance phases.
Hibernia Atlantic	Operational	14.8	Telecom	Complete	Ongoing	Temporal overlap of operational phase with the Proposed Development construction and Operational and Maintenance phases.
Mares Connect	Proposed	36.6	Power Cable	2024-2027	2027 Onward	Potential for temporal overlap of construction and operation with Proposed Development construction and Operational and Maintenance phases.
ESAT 2	Operational	45.4	Telecom	2021	2021 Onward	Potential for temporal overlap of operation with Proposed Development construction and

Project/Plan	Status	Closest Distance from the Proposed Development (km)	Description of Project/Plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Proposed Development
						Operational and Maintenance phases.
CeltixConnect - Sea Fibre Networks	Operational	48.3	Telecom	2022-2026	2021 Onward	Potential for temporal overlap of operation with Proposed Development construction and Operational and Maintenance phases.
Rosslare Europort	Proposed	51.9	Expansion to the existing Europort including a purpose-built ORE quay and berth, quayside ORE storage and construction up to 50 acres in area, navigation channel dredged down to a minimum of -9 m depth and construction of a management control centre and management offices.	2025/2026	2026 Onwards	Potential for temporal overlap of construction with Proposed Development construction and Operational and Maintenance phases.
Hibernia Atlantic – Hibernia C	Operational	53.9	Telecom	Complete	2021 Onwards	Potential for temporal overlap of operation with Proposed Development construction and Operational and Maintenance phases.
SIRIUS South - Telecom	Operational	57.8	Telecom	Complete	2021 Onwards	Potential for temporal overlap of operation with Proposed Development construction and Operational and Maintenance phases.

Project/Plan	Status	Closest Distance from the Proposed Development (km)	Description of Project/Plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Proposed Development
Dredging and disposal						
Wicklow Port Company dredge disposal	Operational	7.9	Dredge disposal	N/A	2024 Onwards	Potential for temporal overlap of operation with Proposed Development construction and Operational and Maintenance phases.

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Offshore Cumulative Effects Assessment Matrix - Aggregates - Celtic Sea Region

Other Development Details											Phases of Other Developments in relation to the construction phase of the Proposed Development (denoted in red)														Stage 1				Stage 2									
ID	Area	Area Number	Company	Start Date	End Date	Status	Distance to the Proposed Development Array Area (km)	Distance to the Proposed Development Cable Corridor and Working Area (km)	Tier	Region	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	Project located within ICES Celtic Sea 7a	ICES Celtic Sea	Within ZoI for at least one topic?	Progress to Stage 2?	Overlap in temporal scope?	Benthic Subtidal and Intertidal Ecology		Fish, Shellfish and Sea Turtle Ecology		Marine Mammals		Offshore Ornithology	
																																Potential LSE Criteria	Progress to Stage 3/4?	Potential LSE Criteria	Progress to Stage 3/4?	Potential LSE Criteria	Progress to Stage 3/4?	Potential LSE Criteria	Progress to Stage 3/4?
AGG_01	Culver Sands	472	Hanson Aggregates Marine Ltd & CEMEX UK Marine Ltd	2013	2014	Not active	157.78	236.22	1	Celtic Sea															No	Yes	Yes	Yes	No	e	No	g	No	e	No	g	No
AGG_02	Culver Extension	526	Hanson Aggregates Marine Ltd & CEMEX UK Marine Ltd	2017	2017	Unknown	157.78	232.55	1	Celtic Sea															No	Yes	Yes	Yes	No	e	No	g	No	e	No	g	No
AGG_03	Culver Extension	526	Hanson Aggregates Marine Ltd & CEMEX UK Marine Ltd	2019	2020	Unknown	157.78	235.70	1	Celtic Sea															No	Yes	Yes	Yes	No	e	No	g	No	e	No	g	No
AGG_04	Area 470 Extension	531	Llanelli Sand Dredging Ltd	2019	2020	Unknown	157.78	243.93	1	Celtic Sea															No	Yes	Yes	Yes	No	e	No	g	No	e	No	g	No
AGG_05	Culver Sands	472	Hanson Aggregates Marine Ltd & CEMEX UK Marine Ltd	2015	2016	Not active	170.01	236.22	1	Celtic Sea															No	Yes	Yes	Yes	No	e	No	g	No	e	No	g	No
AGG_06	Culver Sands	472	Hanson Aggregates Marine Ltd & CEMEX UK Marine Ltd	2017	2018	Not active	170.01	236.22	1	Celtic Sea															No	Yes	Yes	Yes	No	e	No	g	No	e	No	g	No
AGG_07	Culver Sands	472	Hanson Aggregates Marine Ltd & CEMEX UK Marine Ltd	2019	2019	Active	170.01	236.22	1	Celtic Sea															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AGG_08	Hilbre Swash	392	Tarmac Marine Dredging Ltd & Norwest Sand & Ballast Co.	2015	2016	Not active	170.01	174.24	1	Celtic Sea															Yes	Yes	Yes	Yes	No	e	No	g	No	e	No	g	No
AGG_09	Hilbre Swash	393	Tarmac Marine Dredging Ltd & Norwest Sand & Ballast Co.	2015	2016	Not active	170.94	174.24	1	Celtic Sea															Yes	Yes	Yes	Yes	No	e	No	g	No	e	No	g	No
AGG_10	Hilbre Swash	392	Tarmac Marine Dredging Ltd & Norwest Sand & Ballast Co.	2017	2018	Not active	170.94	170.05	1	Celtic Sea															Yes	Yes	Yes	Yes	No	e	No	g	No	e	No	g	No
AGG_11	Hilbre Swash	393	Tarmac Marine Dredging Ltd & Norwest Sand & Ballast Co.	2017	2018	Not active	170.94	170.05	1	Celtic Sea															Yes	Yes	Yes	Yes	No	e	No	g	No	e	No	g	No
AGG_12	Hilbre Swash	392	Tarmac Marine Dredging Ltd & Norwest Sand & Ballast Co.	2019	2020	Active	170.94	170.05	1	Celtic Sea															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AGG_13	Hilbre Swash	393	Tarmac Marine Dredging Ltd & Norwest Sand & Ballast Co.	2019	2020	Active	170.94	170.05	1	Celtic Sea															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AGG_14	Hilbre Swash	392	Tarmac Marine Dredging Ltd & Norwest Sand & Ballast Co.	2013	2014	Not active	170.94	170.05	1	Celtic Sea															Yes	Yes	Yes	Yes	No	e	No	g	No	e	No	g	No
AGG_15	Hilbre Swash	393	Tarmac Marine Dredging Ltd & Norwest Sand & Ballast Co.	2013	2014	Not active	170.94	170.05	1	Celtic Sea															Yes	Yes	Yes	Yes	No	e	No	g	No	e	No	g	No
AGG_16	Holm Sand	377	Unknown	2013	2014	Not active	171.21	238.60	1	Celtic Sea															No	Yes	Yes	Yes	No	e	No	g	No	e	No	g	No
AGG_17	Holm Sand	379	Unknown	2013	2014	Not active	175.11	238.60	1	Celtic Sea															No	Yes	Yes	Yes	No	e	No	g	No	e	No	g	No
AGG_18	Holm Sand	381	Unknown	2013	2014	Not active	175.11	238.60	1	Celtic Sea															No	Yes	Yes	Yes	No	e	No	g	No	e	No	g	No
AGG_19	Liverpool Bay	457	Westminster Gravels Ltd.	2013	2014	Not active	194.40	169.09	1	Celtic Sea															Yes	Yes	Yes	Yes	No	e	No	g	No	e	No	g	No
AGG_20	Liverpool Bay	457	Westminster Gravels Ltd.	2015	2016	Not active	233.24	169.09	1	Celtic Sea															Yes	Yes	Yes	Yes	No	e	No	g	No	e	No	g	No
AGG_21	Liverpool Bay	457	Westminster Gravels Ltd.	2017	2018	Not active	236.38	169.09	1	Celtic Sea															Yes	Yes	Yes	Yes	No	e	No	g	No	e	No	g	No
AGG_22	Liverpool Bay	457	Westminster Gravels Ltd.	2019	2020	Active	236.90	169.09	1	Celtic Sea															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AGG_23	Liverpool Bay	518	Westminster Gravels Ltd.	2017	2017	Unknown	236.90	170.05	1	Celtic Sea															Yes	Yes	Yes	Yes	No	e	No	g	No	e	No	g	No
AGG_24	Liverpool Bay	1808	Westminster Gravels Ltd.	2020	2020	Unknown	236.90	170.32	1	Celtic Sea															Yes	Yes	Yes	Yes	No	e	No	g	No	e	No	g	No
AGG_25	Middle Ground	385	Severn Sands Ltd.	2013	2014	Not active	236.90	243.86	1	Celtic Sea															No	Yes	Yes	Yes	No	e	No	g	No	e	No	g	No
AGG_26	Morecambe Bay	331	Tarmac Marine Ltd.	2013	2014	Not active	239.27	193.40	1	Celtic Sea															Yes	Yes	Yes	Yes	No	e	No	g	No	e	No	g	No
AGG_27	NOBEL Banks	476	Llanelli Sand Dredging Ltd.	2013	2014	Not active	239.27	157.07	1	Celtic Sea															No	Yes	Yes	Yes	No	e	No	g	No	e	No	g	No
AGG_28	NOBEL Banks	476	Llanelli Sand Dredging Ltd.	2015	2016	Not active	239.27	157.07	1	Celtic Sea															No	Yes	Yes	Yes	No	e	No	g	No	e	No	g	No
AGG_29	NOBEL Banks	476	Llanelli Sand Dredging Ltd.	2017	2018	Not active	244.52	157.07	1	Celtic Sea															No	Yes	Yes	Yes	No	e	No	g	No	e	No	g	No
AGG_30	NOBEL Banks	476	Llanelli Sand Dredging Ltd.	2019	2020	Active	244.59	157.07	1	Celtic Sea															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AGG_31	North Bristol Deep	470/2	Tarmac Marine Ltd.	2013	2014	Not active	244.62	245.68	1	Celtic Sea															No	Yes	Yes	Yes	No	e	No	g	No	e	No	g	No
AGG_32	North Bristol Deep	470/2	Tarmac Marine Ltd.	2015	2016	Not active	244.62	245.68	1	Celtic Sea															No	Yes	Yes	Yes	No	e	No	g	No	e	No	g	No
AGG_33	North Bristol Deep	470/1	Hanson Aggregates Marine Ltd.	2013	2014	Not active	244.62	243.97	1	Celtic Sea															No	Yes	Yes	Yes	No	e	No	g	No	e	No	g	No
AGG_34	North Bristol Deep	470/1	Hanson Aggregates Marine Ltd.	2015	2016	Not active	244.62	243.97	1	Celtic Sea															No	Yes	Yes	Yes	No	e	No	g	No	e	No	g	No
AGG_35	North Bristol Deep	470/2	Tarmac Marine Ltd.	2017	2018	Not active	246.33	245.68	1	Celtic Sea															No	Yes	Yes	Yes	No	e	No	g	No	e	No	g	No
AGG_36	North Bristol Deep	470/1	Hanson Aggregates Marine Ltd.	2017	2018	Not active	246.33	243.97	1	Celtic Sea															No	Yes	Yes	Yes	No	e	No	g	No	e	No	g	No
AGG_37	North Bristol Deep	470/1	Hanson Aggregates Marine Ltd.	2019	2020	Active	246.33	243.97	1	Celtic Sea															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AGG_38	North Middle Ground	455	Severn Sands Ltd.	2013	2014	Not active	246.34	245.70	1	Celtic Sea															No	Yes	Yes	Yes	No	e	No	g	No	e	No	g	No
AGG_39	North Middle Ground	455	Severn Sands Ltd.	2015	2016	Not active	246.34	245.70	1	Celtic Sea															No	Yes	Yes	Yes	No	e	No	g	No	e	No	g	No
AGG_40	North Bristol Deep	470/2	Tarmac Marine Ltd.	2019	2020	Active	246.33	245.68	1	Celtic Sea															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AGG_41	North Middle Ground	459	Severn Sands Ltd.	2013	2014	Not active	246.34	247.65	1	Celtic Sea															No	Yes	Yes	Yes	No	e	No	g	No	e	No	g	No
AGG_42	North Middle Ground	459	Severn Sands Ltd.	2015	2016	Not active	246.34	247.65	1	Celtic Sea															No	Yes	Yes	Yes	No	e	No	g	No	e	No	g	No
AGG_43	North Middle Ground	455	Severn Sands Ltd.	2017	2018	Not active	248.29	245.70	1	Celtic Sea															No	Yes	Yes	Yes	No	e	No	g	No	e	No	g	No
AGG_44	North Middle Ground	455	Severn Sands Ltd.	2019	2020	Active	248.29	245.70	1	Celtic Sea															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AGG_45	North Middle Ground	459	Severn Sands Ltd.	2017	2018	Not active	248.29	247.65	1	Celtic Sea															No	Yes	Yes	Yes	No	e	No	g	No	e	No	g	No
AGG_46	North Middle Ground	459	Severn Sands Ltd.	2019	2020	Active	248.29	247.65	1	Celtic Sea															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AGG_47	Pole Sands (Dawlish Warren)	527	Unknown	2017	2018	Not active	290.5	289.8	1	Celtic Sea															No	Yes	Yes	Yes	No	e	No	g	No	e	No	g	No
AGG_48	Pole Sands (Dawlish Warren)	527	Unknown	2019	2020	Active	290.5	289.8	1	Celtic Sea															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AGG_49	Pointe d'Armor "ancien périmètre"	517	Unknown	2009	2009	Unknown	459.3	458.7	2	Celtic Sea															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AGG_50	Pointe d'Armor	119	Unknown	2015	2030	Active	460.0	459.3	3	Celtic Sea															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AGG_51	Pointe d'Armor	169	Unknown	2015	2016	Not active	460.3	459.6	4	Celtic Sea															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AGG_52	Les Duons "ancien périmètre" 1965-1999	134	Unknown	1965	1999	Not active	463.4	462.7	5	Celtic Sea															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AGG_53	Les Duons	136	Unknown	2011	2036	Active	463.4	462.7	6	Celtic Sea															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AGG_54	Les Duons "ancien périmètre" 1999-2011	135	Unknown	1999	2011	Not active	463.4	462.7	7	Celtic Sea															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AGG_55	Jaudy "ancien périmètre" 1988-2003	112	Unknown	1988	2003	Not active	466.9	466.2	8	Celtic Sea															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AGG_56	Jaudy "ancien périmètre" 2004-2007	140	Unknown	2004	2007	Not active	467.1	466.4	9	Celtic Sea															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AGG_57	Jaudy "ancien périmètre" 1988-1998	139	Unknown	1988	1998	Not active	467.9	467.2	10	Celtic Sea															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AGG_58	Beg an Fry	126	Unknown	1999	2013	Not active	465.8	465.1	11	Celtic Sea															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AGG_59	Beg an Fry "ancien périmètre"	100	Unknown	1989	1997	Not active	466.4	465.7	12	Celtic Sea															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AGG_60	Beg an Fry "ancien périmètre"	125	Unknown	1997	1999	Not active	466.8	466.2	13	Celtic Sea															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AGG_61	Aber Benoît	98	Unknown	1989	2001	Not active	463.7	463.0	14	Celtic Sea															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AGG_62	Leguer	168	Unknown	1988	1993	Not active	469.5	468.8	15	Celtic Sea															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AGG_63	La Croix "ancien périmètre"	124	Unknown	1988	2013	Not active	472.6	471.9	16	Celtic Sea															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AGG_64	La Cormorandière	103	Unknown	1996	0	Unknown	478.2	477.5	17	Celtic Sea															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AGG_65	La Cormorandière "solicitè"	994	Unknown	0	0	Unknown	478.2	477.5	18	Celtic Sea															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AGG_66	La Horaine	106	Unknown	2010	2035	Active	481.6	480.9	19	Celtic Sea															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AGG_67	Lost Pic "ancien périmètre"	113	Unknown	1996	2012	Not active	481.3	480.6	20	Celtic Sea															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AGG_68	Lost Pic (Nord)	132	Unknown	2008	2013	Not active	481.7	481.0	21	Celtic Sea															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AGG_69	La Horaine "ancien périmètre"	104	Unknown	1994	2012	Not active	482.6	481.8	22	Celtic Sea															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AGG_70	Aber Ildut	99	Unknown	1981	2006	Not active	475.1	474.5	23	Celtic Sea															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AGG_71	Lost Pic (Sud)	133	Unknown	2008	2013	Not active	483.4	482.7	24	Celtic Sea															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AGG_72	Plateau des Fourches	105	Unknown	1981	2006	Not active	476.8	476.1	25	Celtic Sea															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AGG_73	Les Pourceaux	110	Unknown	1937	2011	Not active	481.1	480.4	26	Celtic Sea															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AGG_74	Le Grand Minou	123	Unknown	1999	2011	Not active	491.1	490.4	27	Celtic Sea															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AGG_75	Le Minou	122	Unknown	1932	2011	Not active	491.9	491.3	28	Celtic Sea															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AGG_76	Le Minou	991	Unknown	2011	2031	Active	491.9	491.3	29	Celtic Sea															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AGG_77	Ilôt Saint-Michel "ancien périmètre"	101	Unknown	1993	2012	Not active	509.6	508.9	30	Celtic Sea															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AGG_78	Golfe de Saint-Malo	167	Unknown	1999	2009	Not active	513.5	512.8	31	Celtic Sea															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No

Offshore Cumulative Effects Assessment Matrix - Oil and Gas Surface and Subsurface - Infrastructure Celtic Sea Subsection 7a

Other Development Details										Phases of Other Developments in relation to the construction phase of the Proposed Development (denoted in red)														Stage 1			Stage 2								
ID	Project	Type	Group	Surface/subsurface	Status	Distance to the Proposed Development Array Area (km)	Distance to the Proposed Development Cable Corridor and Working Area (km)	Tier	Region	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	Project located within ICES Celtic Sea 7a	Within ZoI for at least one topic?	Progress to Stage 2?	Overlap in temporal scope?	Benthic Subtidal and Intertidal Ecology		Fish, Shellfish and Sea Turtle Ecology		Marine Mammals		Offshore Ornithology	
																												Potential LSE Criteria	Progress to Stage 3/4?	Potential LSE Criteria	Progress to Stage 3/4?	Potential LSE Criteria	Progress to Stage 3/4?	Potential LSE Criteria	Progress to Stage 3/4?
O&GI_01	CONWY PLATFORM	Platform	ENI UK Limited	Surface	Decommissioning	168.2	167.2	1	Wales															Yes	Yes	Yes	Yes	e	No	e	No	e	No	g	No
O&GI_02	SNAGGING HAZARD -CONCRETE MATTRESS- KFB 07/2013 - AREA 5	Protection	ENI UK Limited	Subsurface	Not in Use	168.8	167.9	1	Wales															Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
O&GI_03	DOUGLAS DA	Platform	ENI UK Limited	Surface	Active	169.6	168.7	1	Wales															Yes	Yes	Yes	Yes	e	No	e	No	e	No	g	No
O&GI_04	DOUGLAS DP	Platform	ENI UK Limited	Surface	Active	169.6	168.7	1	Wales															Yes	Yes	Yes	Yes	e	No	e	No	e	No	g	No
O&GI_05	DOUGLAS DW	Platform	ENI UK Limited	Surface	Active	169.7	168.8	1	Wales															Yes	Yes	Yes	Yes	e	No	e	No	e	No	g	No
O&GI_06	TEE PROTECTION STRUCTURE	Protection	Gas Network Ireland	Subsurface	Active	176.2	175.2	1	Wales															Yes	Yes	Yes	Yes	e	No	e	No	e	No	g	No
O&GI_07	OSI ANCHOR 6	Anchor	ENI UK Limited	Subsurface	Active	177.6	176.6	1	Wales															Yes	Yes	Yes	Yes	e	No	e	No	e	No	g	No
O&GI_08	OSI ANCHOR 5	Anchor	ENI UK Limited	Subsurface	Active	177.7	176.7	1	Wales															Yes	Yes	Yes	Yes	e	No	e	No	e	No	g	No
O&GI_09	OSI ANCHOR 4	Anchor	ENI UK Limited	Subsurface	Active	177.7	176.8	1	Wales															Yes	Yes	Yes	Yes	e	No	e	No	e	No	g	No
O&GI_10	OSI ANCHOR 7	Anchor	ENI UK Limited	Subsurface	Active	178.0	177.1	1	Wales															Yes	Yes	Yes	Yes	e	No	e	No	e	No	g	No
O&GI_11	OSI ANCHOR 8	Anchor	ENI UK Limited	Subsurface	Active	178.1	177.2	1	Wales															Yes	Yes	Yes	Yes	e	No	e	No	e	No	g	No
O&GI_12	OSI ANCHOR 9	Anchor	ENI UK Limited	Subsurface	Active	178.2	177.3	1	Wales															Yes	Yes	Yes	Yes	e	No	e	No	e	No	g	No
O&GI_13	HAMILTON	Platform	ENI UK Limited	Surface	Active	178.5	177.6	1	Wales															Yes	Yes	Yes	Yes	e	No	e	No	e	No	g	No
O&GI_14	PLEM AT OSI	Manifold	ENI UK Limited	Subsurface	Active	178.5	177.5	1	Wales															Yes	Yes	Yes	Yes	e	No	e	No	e	No	g	No
O&GI_15	OSI (OFFSHORE STORAGE INST.)	FPSO	ENI UK Limited	Surface	Active	178.5	177.6	1	Wales															Yes	Yes	Yes	Yes	e	No	e	No	e	No	g	No
O&GI_16	OSI ANCHOR 3	Anchor	ENI UK Limited	Subsurface	Active	179.7	178.8	1	Wales															Yes	Yes	Yes	Yes	e	No	e	No	e	No	g	No
O&GI_17	OSI ANCHOR 2	Anchor	ENI UK Limited	Subsurface	Active	179.8	178.8	1	Wales															Yes	Yes	Yes	Yes	e	No	e	No	e	No	g	No
O&GI_18	OSI ANCHOR 1	Anchor	ENI UK Limited	Subsurface	Active	179.8	178.9	1	Wales															Yes	Yes	Yes	Yes	e	No	e	No	e	No	g	No
O&GI_19	HAMILTON NORTH	Platform	ENI UK Limited	Surface	Active	180.7	179.8	1	Wales															Yes	Yes	Yes	Yes	e	No	e	No	e	No	g	No
O&GI_20	110/02b- 9	Wellhead	Harbour Energy PLC	Subsurface	Not in Use	181.1	180.1	1	Wales															Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
O&GI_21	DALTON WELLHEAD PROTECTION STRUCTURE - R2	Protection	Harbour Energy PLC	Subsurface	Active	181.1	180.1	1	Wales															Yes	Yes	Yes	Yes	e	No	e	No	e	No	g	No
O&GI_22	110/02b-R1	Wellhead	Harbour Energy PLC	Subsurface	Not in Use	181.7	180.7	1	Wales															Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
O&GI_23	DALTON WELLHEAD PROTECTION STRUCTURE - R1	Protection	Harbour Energy PLC	Subsurface	Active	181.7	180.7	1	Wales															Yes	Yes	Yes	Yes	e	No	e	No	e	No	g	No
O&GI_24	DALTON PLEM	Manifold	Harbour Energy PLC	Subsurface	Active	181.7	180.7	1	Wales															Yes	Yes	Yes	Yes	e	No	e	No	e	No	g	No
O&GI_25	DALTON PLEM	Manifold	Harbour Energy PLC	Subsurface	Active	181.7	180.7	1	Wales															Yes	Yes	Yes	Yes	e	No	e	No	e	No	g	No
O&GI_26	HAMILTON EAST MANIFOLD	Manifold	ENI UK Limited	Subsurface	Active	182.1	181.1	1	Wales															Yes	Yes	Yes	Yes	e	No	e	No	e	No	g	No
O&GI_27	WELL 110/3-3	Wellhead	Spirit Energy	Subsurface	Removed	185.1	184.1	1	Wales															Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
O&GI_28	WELL 110/2A-7	Wellhead	Spirit Energy	Subsurface	Removed	185.8	184.8	n/a	Wales															Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
O&GI_29	MILLOM EAST PLEM	Manifold	Spirit Energy	Subsurface	Active	186.4	185.5	1	Wales															Yes	Yes	Yes	Yes	e	No	e	No	e	No	g	No
O&GI_30	MILLOM PLEM	Wellhead	Harbour Energy PLC	Subsurface	Active	186.5	185.5	1	Wales															Yes	Yes	Yes	Yes	e	No	e	No	e	No	g	No
O&GI_31	Q1 WELLHEAD	Wellhead	Harbour Energy PLC	Subsurface	Not in Use	186.5	185.5	1	Wales															Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
O&GI_32	MILLOM WELLHEAD PROTECTION STRUCTURE - Q1	Protection	Harbour Energy PLC	Subsurface	Active	186.5	185.5	1	Wales															Yes	Yes	Yes	Yes	e	No	e	No	e	No	g	No
O&GI_33	MILLOM WELLHEAD PROTECTION STRUCTURE - Q2	Protection	Harbour Energy PLC	Subsurface	Active	186.6	185.6	1	Wales															Yes	Yes	Yes	Yes	e	No	e	No	e	No	g	No
O&GI_34	Q2 WELLHEAD	Wellhead	Harbour Energy PLC	Subsurface	Not in Use	186.6	185.6	1	Wales															Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
O&GI_35	Q3 WELLHEAD	Wellhead	Harbour Energy PLC	Subsurface	Not in Use	186.6	185.7	1	Wales															Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
O&GI_36	MILLOM WELLHEAD PROTECTION STRUCTURE - Q3	Protection	Harbour Energy PLC	Subsurface	Active	186.7	185.7	1	Wales															Yes	Yes	Yes	Yes	e	No	e	No	e	No	g	No
O&GI_37	WELL 110/2A-12	Wellhead	Spirit Energy	Subsurface	Removed	187.4	186.5	1	Wales															Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
O&GI_38	WHITEHAVEN WELLHEAD 113/27b- 9	Wellhead	Spirit Energy	Subsurface	Removed	193.4	192.5	n/a	Wales															Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
O&GI_39	BAINS WELL	Wellhead	Harbour Energy PLC	Subsurface	Active	193.8	192.8	1	Wales															Yes	Yes	Yes	Yes	e	No	e	No	e	No	g	No
O&GI_40	BAINS WELLHEAD PROTECTION STRUCTURE	Protection	Spirit Energy	Subsurface	Removed	193.8	192.8	n/a	Wales															Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
O&GI_41	RHYL NORTH WELLHEAD 113/27B-8	Wellhead	Spirit Energy	Subsurface	Active	196.0	195.0	1	Wales															Yes	Yes	Yes	Yes	e	No	e	No	e	No	g	No
O&GI_42	RHYL SUBSEA WELL	Wellhead	Spirit Energy	Subsurface	Active	196.0	195.0	1	Wales															Yes	Yes	Yes	Yes	e	No	e	No	e	No	g	No
O&GI_43	LENNOX	Platform	ENI UK Limited	Surface	Active	198.2	197.3	1	Wales															Yes	Yes	Yes	Yes	e	No	e	No	e	No	g	No
O&GI_44	SNIP	Rock Dump	Mutual Energy Limited	Subsurface	Active	235.4	234.5	1	Scotland/Northern Ireland															Yes	Yes	Yes	Yes	e	No	e	No	e	No	g	No

Offshore Cumulative Effects Assessment Matrix - Oil and Gas Pipelines - Celtic Sea Subsection 7a

Other Development Details								Phases of Other Developments in relation to the construction phase of the Proposed Development (denoted in red)												Stage 1			Stage 2							
ID	Project	Infrastructure Type	Representative Group	Distance to the Proposed Development Array Area (km)	Distance to the Proposed Development Cable Corridor and Working Area (km)	Tier	Region	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	Project located within ICES Celtic Sea 7a	Within ZoI for at least one topic?	Progress to Stage 2?	Overlap in Temporal Scope?	Benthic Subtidal and Intertidal Ecology		Fish, Shellfish and Sea Turtle Ecology		Marine Mammals		Offshore Ornithology	
																										Potential LSE Criteria	Progress to Stage 3/4?	Potential LSE Criteria	Progress to Stage 3/4?	Potential LSE Criteria	Progress to Stage 3/4?	Potential LSE Criteria	Progress to Stage 3/4?
O&GP_01	INTERCONNECTOR 1 SCOTLAND TO IRELAND IC1	PIPELINE	GAS NETWORKS IRELAND	69.6	68.7	1	Scotland and Ireland															Yes	Yes	Yes	Yes	e	No	g	No	d	No	g	No
O&GP_02	INTERCONNECTOR 2 SCOTLAND TO IRELAND IC2	PIPELINE	GAS NETWORKS IRELAND	82.9	82.0	1	Scotland and Ireland															Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
O&GP_03	DD-POA GAS EXPORT	PIPELINE	ENI UK LIMITED	164.5	163.6	1	Wales															Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
O&GP_04	POA-DD CONDENSATE	PIPELINE	ENI UK LIMITED	164.5	163.6	1	Wales															Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
O&GP_05	POA-DD METHANOL	PIPELINE	ENI UK LIMITED	164.5	163.6	1	Wales															Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
O&GP_06	CONWY TO DOUGLAS OIL EXPORT	PIPELINE	ENI UK LIMITED	168.2	167.3	1	Wales															Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
O&GP_07	DOUGLAS TO CONWY CONDENSATE INJECTION	PIPELINE	ENI UK LIMITED	168.2	167.3	1	Wales															Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
O&GP_08	DOUGLAS TO CONWY UMBILICAL	UMBILICAL	ENI UK LIMITED	168.2	167.3	1	Wales															Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
O&GP_09	DOUGLAS TO CONWY OIL EXPORT	PIPELINE	ENI UK LIMITED	168.2	167.3	1	Wales															Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
O&GP_10	DOUGLAS TO CACM	PIPELINE	ENI UK LIMITED	169.6	168.7	1	Wales															Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
O&GP_11	HAMILTON NORTH TO DOUGLAS GAS LINE	PIPELINE	ENI UK LIMITED	169.6	168.7	1	Wales															Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
O&GP_12	DOUGLAS TO HAMILTON NORTH METHANOL	PIPELINE	ENI UK LIMITED	169.6	168.7	1	Wales															Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
O&GP_13	LENNOX TO DOUGLAS GAS LINE	PIPELINE	ENI UK LIMITED	169.7	168.8	1	Wales and England															Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
O&GP_14	LENNOX TO DOUGLAS OIL LINE	PIPELINE	ENI UK LIMITED	169.7	168.8	1	England and Wales															Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
O&GP_15	HAMILTON TO DOUGLAS GAS LINE	PIPELINE	ENI UK LIMITED	169.7	168.8	1	Wales															Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
O&GP_16	DOUGLAS TO LENNOX METHANOL	PIPELINE	ENI UK LIMITED	169.7	168.8	1	England and Wales															Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
O&GP_17	DOUGLAS TO LENNOX WAX INHIBITOR	PIPELINE	ENI UK LIMITED	169.7	168.8	1	England and Wales															Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
O&GP_18	LENNOX TO DOUGLAS GAS PRODUCTION	PIPELINE	ENI UK LIMITED	169.7	168.8	1	England and Wales															Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
O&GP_19	DOUGLAS TO LENNOX GAS LINE (PL1036A)	PIPELINE	ENI UK LIMITED	169.7	168.8	1	England and Wales															Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
O&GP_20	DOUGLAS TO HAMILTON	PIPELINE	ENI UK LIMITED	169.7	168.8	1	Wales															Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
O&GP_21	ISLE OF MAN CONTROL UMBILICAL (IOMCU)	UMBILICAL	GAS NETWORKS IRELAND	173.5	172.5	1	Ireland and Isle of Man															Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
O&GP_22	ISLE OF MAN SPUR (IOMS)	PIPELINE	GAS NETWORKS IRELAND	173.5	172.5	1	Ireland and Isle of Man															Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
O&GP_23	PL6340 CALDER TO CPP1	UMBILICAL	HARBOUR ENERGY PLC	178.7	177.8	1	England															Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
O&GP_24	RIVERS ONSHORE TERMINAL TO CALDER	PIPELINE	HARBOUR ENERGY PLC	178.9	177.9	1	England															Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
O&GP_25	CALDER TO RIVERS ONSHORE TERMINAL	PIPELINE	HARBOUR ENERGY PLC	178.9	177.9	1	England															Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
O&GP_26	HAMILTON EAST UMBILICAL	UMBILICAL	ENI UK LIMITED	180.7	179.8	1	Wales															Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
O&GP_27	HAMILTON EAST PIPELINE	PIPELINE	ENI UK LIMITED	180.7	179.8	1	Wales															Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
O&GP_28	DALTON PLEM TO DALTON WELLHEAD R2	UMBILICAL	HARBOUR ENERGY PLC	181.1	180.1	1	England															Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
O&GP_29	WELLHEAD R2 TO DALTON PLEM	PIPELINE	HARBOUR ENERGY PLC	181.1	180.1	1	England															Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
O&GP_30	DALTON WELLHEAD R1 TO DALTON PLEM	PIPELINE	HARBOUR ENERGY PLC	181.7	180.7	1	England															Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
O&GP_31	DALTON PLEM TO DALTON WELLHEAD R1	UMBILICAL	HARBOUR ENERGY PLC	181.7	180.7	1	England															Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
O&GP_32	MORECAMBE DPPA TO DALTON PLEM	UMBILICAL	HARBOUR ENERGY PLC	181.7	180.7	1	England															Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
O&GP_33	DALTON PLEM TO DPPA	PIPELINE	HARBOUR ENERGY PLC	181.7	180.7	1	England															Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
O&GP_34	MILLOM WEST TO MILLOM PLEM	PIPELINE	HARBOUR ENERGY PLC	183.2	182.3	1	England															Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
O&GP_35	MILLOM PLEM TO MILLOM WEST	PIPELINE	HARBOUR ENERGY PLC	183.2	182.3	1	England															Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
O&GP_36	MORECAMBE DPPA TO MILLOM WEST ELECTRIC	UMBILICAL	HARBOUR ENERGY PLC	183.2	182.2	1	England															Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
O&GP_37	MORECAMBE CPP1 TO DP6	PIPELINE	SPIRIT ENERGY	184.8	183.8	1	England															Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
O&GP_38	CPP1 TO DP8 ELECTRICAL / FIBRE COMMS	PIPELINE	SPIRIT ENERGY	184.8	183.9	1	England															Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
O&GP_39	MORECAMBE DP6 TO CPP1	PIPELINE	SPIRIT ENERGY	184.9	183.9	1	England															Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
O&GP_40	MORECAMBE DP3 TO CPP1 ELECTRIC (IF-07E31)	PIPELINE	SPIRIT ENERGY	185.0	184.1	1	England															Yes	Yes	Yes	No	e	No	e	No	d	No	g	No
O&GP_41	SOUTH MORECAMBE CPP1 TO CUT POINT A ELECTRICAL	PIPELINE	SPIRIT ENERGY	185.0	184.0	1	England															Yes	Yes	Yes	No	e	No	e	No	d	No	g	No
O&GP_42	MORECAMBE CPP1 TO DP3 ELECTRIC (IF-07E13)	PIPELINE	SPIRIT ENERGY	185.0	184.1	1	England															Yes	Yes	Yes	No	e	No	e	No	d	No	g	No
O&GP_43	MORECAMBE CPP1 TO DP3	PIPELINE	SPIRIT ENERGY	185.0	184.0	1	England															Yes	Yes	Yes	No	e	No	e	No	d	No	g	No
O&GP_44	MORECAMBE DP3 TO CPP1	PIPELINE	SPIRIT ENERGY	185.0	184.1	1	England															Yes	Yes	Yes	No	e	No	e	No	d	No	g	No
O&GP_45	MORECAMBE CPP1 TO DP8	PIPELINE	SPIRIT ENERGY	185.6	184.6	1	England															Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
O&GP_46	MORECAMBE DP8 TO CPP1	PIPELINE	SPIRIT ENERGY	185.6	184.7	1	England															Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
O&GP_47	MORECAMBE CPP1 TO DP4	PIPELINE	SPIRIT ENERGY	185.7	184.7	1	England															Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
O&GP_48	SMT TRUNKLINE	PIPELINE	SPIRIT ENERGY	185.7	184.7	1	England															Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
O&GP_49	MORECAMBE DP4 TO CPP1	PIPELINE	SPIRIT ENERGY	185.7	184.7	1	England															Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
O&GP_50	CPP1 Main Switchboard to Cut Point A (Electrical)	PIPELINE	SPIRIT ENERGY	185.7	184.7	1	England															Yes	Yes	Yes	No	e	No	e	No	d	No	g	No
O&GP_51	BAINS TO MORECAMBE DP1	PIPELINE	SPIRIT ENERGY	185.8	184.8	1	England															Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
O&GP_52	MORECAMBE DP1 TO BAINS	UMBILICAL	SPIRIT ENERGY	185.8	184.8	1	England															Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
O&GP_53	CUT POINT C TO DP8 ELECTRICAL / FIBER-OPTIC	UMBILICAL	SPIRIT ENERGY	186.2	185.2	1	England															Yes	Yes	Yes	No	e	No	e	No	d	No	g	No
O&GP_54	MILLOM PLEM TO DPPA	PIPELINE	HARBOUR ENERGY PLC	186.4	185.4	1	England															Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
O&GP_55	MILLOM WELLHEAD Q3 TO MILLOM PLEM	PIPELINE	HARBOUR ENERGY PLC	186.4	185.5	1	England															Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
O&GP_56	MILLOM PLEM TO MILLOM WELLHEAD Q3 CHEM	UMBILICAL	HARBOUR ENERGY PLC	186.4	185.5	1	England															Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
O&GP_57	MILLOM PLEM TO MILLOM WELLHEAD Q1	UMBILICAL	HARBOUR ENERGY PLC	186.5	185.5	1	England															Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
O&GP_58	MILLOM WELLHEAD Q1 TO MILLOM PLEM	PIPELINE	HARBOUR ENERGY PLC	186.5	185.5	1	England															Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
O&GP_59	MILLOM WELLHEAD Q2 TO MILLOM PLEM	PIPELINE	HARBOUR ENERGY PLC	186.5	185.5	1	England															Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
O&GP_60	MILLOM PLEM TO MILLOM WELLHEAD Q2 CHEM	UMBILICAL	HARBOUR ENERGY PLC	186.5	185.5	1	England															Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
O&GP_61	MORECAMBE DPPA TO MILLOM PLEM	UMBILICAL	HARBOUR ENERGY PLC	186.5	185.5	1	England															Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
O&GP_62	RHYL-DPPA IMPORT PRODUCTION FLEX PIPE	PIPELINE	SPIRIT ENERGY	188.1	187.1	1	Wales															Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
O&GP_63	RHYL-DPPA CONTROL/CHEM INJ UMBILICAL	UMBILICAL	SPIRIT ENERGY	188.1	187.1	1	Wales															Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
O&GP_64	NMT METHANOL	PIPELINE	SPIRIT ENERGY	188.1	187.1	1	England															Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
O&GP_65	NMT TRUNKLINE	PIPELINE	SPIRIT ENERGY	188.1	187.1	1	England															Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
O&GP_66	BELFAST LOUGH CROSSING (BLC)	PIPELINE	MUTUAL ENERGY LIMITED	191.6	190.7	1	Ireland															Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
O&GP_67	RHYL SUTU TO RHYL NORTH WELLHEAD UMBILICAL	UMBILICAL	SPIRIT ENERGY	196.0	195.0	1	Wales															Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
O&GP_68	RHYL SUTU TO RHYL DEVELOPMENT WELLHEAD UMBILICAL	UMBILICAL	SPIRIT ENERGY	196.0	195.0	1	Wales															Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
O&GP_69	DOUGLAS TO HAMILTON ELECTRICAL SUPPLY	UMBILICAL	ENI UK LIMITED	169.7	168.8	1	Wales															Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
O&GP_70	DOUGLAS TO HAMILTON NORTH ELECTRICAL SUPPLY	UMBILICAL	ENI UK LIMITED	169.7	168.8	1	Wales															Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
O&GP_71	HAMILTON TO LENNOX ELECTRICAL SUPPLY	UMBILICAL	ENI UK LIMITED	178.5	177.6	1	Wales															Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
O&GP_72	SCOTLAND TO N IRELAND PIPELINE (SNIP)	PIPELINE	MUTUAL ENERGY LIMITED	215.7	214.8	1	Scotland and Northern Ireland															Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No

Offshore Cumulative Effects Assessment Matrix - Offshore Wind - MMMU

Other Development Details								Phases of Other Developments in relation to the construction phase of the Proposed Development (denoted in red)												Stage 1					Stage 2								
ID	Project	Developer	Status	Distance to the Proposed Development Array Area (km)	Distance to the Proposed Development Cable Corridor and Working Area (km)	Tier	Region	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	Project located within ICES Celtic Sea 7a	ICES Celtic Sea	MMMU	Within ZoI for at least one topic?	Progress to Stage 2?	Overlap in temporal scope?	Benthic Subtidal and Intertidal Ecology		Fish, Shellfish and Sea Turtle Ecology		Marine Mammals		Offshore Ornithology	
																												Potential LSE Criteria	Progress to Stage 3/4?	Potential LSE Criteria	Progress to Stage 3/4?	Potential LSE Criteria	Progress to Stage 3/4?	Potential LSE Criteria	Progress to Stage 3/4?
OWF_01	Arklow Bank Wind Park 1	GE Energy	Operational	0.0	0.5	1	Ireland															Yes	Yes	Yes	Yes	Yes	Yes	b	Yes	b	Yes	g	No	b	Yes
OWF_02	Arklow Bank Wind Park 1	GE Energy	Decomissioning (decom of ABWP1 7 WTGs fixed bottom) - assumed to be similar decom process to that of ABWP2 as per the ABWP2 Rehabilitation Schedule	0.0	0.5	3	Ireland															Yes	Yes	Yes	Yes	Yes	Yes	c	Yes	c	Yes	c	Yes	c	Yes
OWF_03	Codling Wind Park	Fred. Olsen Seawind, EDF Energies	Planning application submitted	10.3	9.4	1	Ireland															Yes	Yes	Yes	Yes	Yes	Yes	c	Yes	c	Yes	c	Yes	c	Yes
OWF_04	Dublin Array	RWE	Planning application submitted	25.8	24.9	1	Ireland															Yes	Yes	Yes	Yes	Yes	Yes	c	Yes	c	Yes	c	Yes	c	Yes
OWF_05	North Irish Sea Array	Statkraft	Planning application submitted	65.1	64.1	1	Ireland															Yes	Yes	Yes	Yes	Yes	Yes	e	No	c	Yes	c	Yes	c	Yes
OWF_06	Draig y Mor	Unknown	Concept/Early Planning	82.6	81.7	3	Wales															Yes	Yes	Yes	Yes	Yes	Yes	e	No	e	No	g	No	f	no
OWF_07	Tonn Nua	Unknown	Concept/Early Planning	101.2	100.6	3	Republic of Ireland															Yes	Yes	Yes	Yes	Yes	No	e	No	e	No	g	No	f	no
OWF_08	Oriel	Oriel Windfarm Limited,Parkwind NV,ESB	Planning application submitted	108.1	107.2	1	Ireland															No	Yes	Yes	Yes	Yes	No	e	No	e	No	c	Yes	c	Yes
OWF_09	Erebus Floating Wind Demo	Simply Blue Energy & Total Energy	Consented	133.3	132.7	1	England/Wales															No	Yes	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	c	Yes
OWF_10	Gwynt Glas	EDF Renewables UK and ESB	Concept/Early Planning	139.8	139.1	3	Wales															Yes	Yes	Yes	Yes	Yes	No	e	No	e	No	c	Yes	f	no
OWF_11	Mona	EnBW and BP	Consented	146.7	145.7	2	England/Wales															Yes	Yes	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	c	Yes
OWF_12	Llyr 1	Llyr 1 Cierco Ltd.,SBM Offshore N.V.	Planning application submitted	148.0	147.3	3	England/Wales															No	Yes	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	c	Yes
OWF_13	Awel y Môr	RWE Renewables	Consented	148.5	147.6	1	England/Wales															Yes	Yes	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	c	Yes
OWF_14	Llyr 2	Llyr 2 Cierco Ltd.,SBM Offshore N.V.	Pre-planning application	151.9	151.2	3	England/Wales															No	Yes	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	f	No
OWF_15	Rhyl Flats	RWE Npower	Operational	156.3	155.5	1	England/Wales															No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	b	Yes
OWF_16	Gwynt y Mor	RWE	Operational	159.0	158.1	1	England/Wales															Yes	Yes	Yes	Yes	Yes	Yes	e	No	e	No	g	No	b	Yes
OWF_17	Round 5 PDA2	Unknown	Concept/Early Planning	163.0	162.4	3	England															No	No	Yes	Yes	Yes	No	e	No	e	No	g	No	f	no
OWF_18	Morgan	EnBW and BP	Consented	165.3	164.3	1	England/Wales															Yes	Yes	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	c	Yes
OWF_19	North Hoyle	Greencoat	Operational	170.9	170.1	1	England/Wales															Yes	Yes	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	b	Yes
OWF_20	Morecambe	Cobra & Flotation Energy	Planning application submitted	174.2	173.3	3	England/Wales															Yes	Yes	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	c	Yes
OWF_21	White Cross	White Cross Flotation Energy plc,COBRA INSTALACIONES Y SERVICIOS, S.A.	Consented	174.7	174.0	1	England/Wales															No	Yes	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	c	Yes
OWF_22	Isle of Man (Mooir Vannin)	Orsted & Isle of Man Government	Planning application submitted	179.2	178.2	3	Isle of Man															Yes	Yes	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	c	Yes
OWF_23	Burbo Bank Extension	Ørsted	Operational	180.6	179.8	1	England/Wales															Yes	Yes	Yes	Yes	Yes	Yes	e	No	e	No	g	No	b	Yes
OWF_24	Round 5 PDA3	Equinor	Concept/Early Planning	185.4	184.8	3	England															No	No	Yes	Yes	Yes	No	e	No	e	No	g	No	f	no
OWF_25	Walney Extension 3	Ørsted	Operational	187.1	186.1	1	England/Wales															Yes	Yes	Yes	Yes	Yes	Yes	e	No	e	No	g	No	b	Yes
OWF_26	Walney Extension 4	Walney Extension Limited	Operational	189.5	188.5	1	England/Wales															Yes	Yes	Yes	Yes	Yes	Yes	e	No	e	No	g	No	b	Yes
OWF_27	Burbo Bank	Ørsted	Operational	189.9	189.0	1	England/Wales															Yes	Yes	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	b	Yes
OWF_28	Walney 2	Ørsted	Operational	196.5	195.5	1	England/Wales															Yes	Yes	Yes	Yes	Yes	Yes	e	No	e	No	g	No	b	Yes
OWF_29	West of Duddon Sands	Scottish Power Renewables & Ørsted	Operational	196.9	195.9	1	England/Wales															Yes	Yes	Yes	Yes	Yes	Yes	e	No	e	No	g	No	b	Yes
OWF_30	Walney 1	Ørsted	Operational	199.1	198.1	1	England/Wales															Yes	Yes	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	b	Yes
OWF_31	North Channel Wind 2	North Channel Wind 2	Pre-planning application	204.0	203.1	3	Northern Ireland															Yes	Yes	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	f	No
OWF_32	Ormonde	Vattenfall	Operational	207.4	206.4	1	England/Wales															Yes	Yes	Yes	Yes	Yes	Yes	e	No	e	No	g	No	b	Yes
OWF_33	Barrow	Ørsted	Operational	208.6	207.6	1	England/Wales															Yes	Yes	Yes	Yes	Yes	Yes	e	No	e	No	g	No	b	Yes
OWF_34	North Channel Wind 1	North Channel Wind 1	Pre-planning application	227.9	227.0	3	Northern Ireland															Yes	Yes	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	f	No
OWF_35	Robin Rigg West	E.ON UK	Operational	247.3	246.3	1	Scotland															No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	b	Yes
OWF_36	Robin Rigg East	E.ON UK	Operational	249.9	248.9	1	Scotland															Yes	Yes	Yes	Yes	Yes	Yes	e	No	e	No	g	No	b	Yes
OWF_37	TwinHub	Hexicon	Operational	256.2	255.6	1	England/Wales															No	Yes	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	b	Yes
OWF_38	Sceirde Rocks	Fuinneamh Sceirde Teoranta / GIG	Cancelled	264.3	254.1	2	Ireland															No	Yes	Yes	Yes	Yes	No	e	No	e	No	f	No	g	No
OWF_39	Malin Sea Wind	ESB	Concept/Early Planning	283.1	282.2	3	Scotland															No	No	Yes	Yes	Yes	No	e	No	e	No	g	No	f	no
OWF_40	Machair	MachairWind SPR Ltd.	Pre-planning application	326.0	325.1	3	Scotland															No	Yes	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	f	No
OWF_41	Teesside	EDF Energy - Northern Offshore Windfarm Ltd	Operational	369.1	368.1	1	England/Wales															No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_42	Blyth	Blyth Harbor Wind Ltd	Operational	379.6	378.6	1	England/Wales															No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_43	Blyth Demo Phase 1	EDF Energy Renewables	Operational	382.9	382.0	1	England/Wales															No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_44	Blyth Demonstration Site	EDF Energy Renewables	Operational	388.5	387.5	1	England/Wales															No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_45	Forthwind	Cierco	Consented	405.9	404.9	2	Scotland															No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_46	Methil Demo/Levenmouth	ORE Catapult Ltd	Operational	407.5	406.5	1	Scotland															No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_47	Westermost Rough	Ørsted	Operational	410.5	409.7	1	England/Wales															No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_48	Humber Gateway	E.ON Humber Wind Ltd / Balfour Beatty Investments and Equitix.	Operational	418.1	417.3	1	England/Wales															No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_49	Lynn	XceCo	Operational	424.9	424.2	1	England/Wales															No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_50	Inner Dowsing	XceCo	Operational	425.2	424.5	1	England/Wales															No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_51	Lincs	Ørsted	Operational	426.5	425.8	1	England/Wales															No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_52	Neart Na Gaoithe	Mainstream Renewable Power	Operational	435.4	434.4	1	Scotland															No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_53	Triton Knoll	Innogy	Operational	444.6	443.8	1	England/Wales															No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_54	Rampion	E.ON UK	Operational	445.7	445.0	1	England/Wales															No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_55	Berwick Bank	Scottish Southern Energy Renewables	Consented	446.4	445.4	2	Scotland															No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_56	Race Bank	Ørsted / Macquarie Group	Operational	448.3	447.5	1	England/Wales															No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_57	Rampion 2	Rampion 2 OWF	Consented	450.7	450.0	1	England/Wales															No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_58	Inch Cape	Red Rock Power (ICOL)	Under construction	456.4	455.4	1	Scotland															No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_59	Parc éolien posé au large de la Normandie (AO4)	Unknown	Pre-planning application	464.8	464.1	2	France															No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	f	No
OWF_60	Outer Dowsing	Green Investment Group - Total	Planning application submitted	465.5	464.7	3	England/Wales															No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_61	Sheringham Shoal Extension	Equinor	Consented	465.5	464.8	1	England/Wales															No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_62	Sheringham Shoal Extension	Equinor	Consented	468.5	467.7	2	England/Wales															No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_63	Centre-Manche 1	EDF and Maple Power	Planning application submitted	468.9	468.2	3	France															No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	f	No
OWF_64	Seagreen Phase 1	SSE / Seagreen Wind Energy Ltd	Operational	474.6	473.6	1	Scotland															No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_65	Dudgeon Extension	Equinor	Consented	475.2	474.5	1	England/Wales															No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_66	Seagreen Phase 1A	TotalEnergies/SSE	Consented	476.0	475.0	2	Scotland															No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_67	Hornsea Project Four	Ørsted	Cancelled	476.4	475.5	n/a	England/Wales															~~No~~	~~No~~	~~Yes~~	~~Yes~~	~~Yes~~	No	e	No	e	No	f	No	g	No
OWF_68	Centre-Manche 2	TotalEnergies / RWE	Pre-planning application	476.8	476.1	3	France															No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	f	No
OWF_69	Saint-Brieuc	Iberdrola	Under construction	480.6	479.9	1	France															No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_70	Dudgeon	Statoil / Statkraft	Operational	484.7	484.0	1	England/Wales															No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_71	Kentish Flats Extension	Vattenfall	Operational	498.0	497.4	1	England/Wales															No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_72	Kentish Flats	Vattenfall	Operational	499.3	498.7	1	England/Wales															No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_73	Hornsea Project Two	Ørsted	Operational	499.3	498.5	1	England/Wales															No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_74	Gunfleet Sands I	Ørsted	Operational	499.5	499.0	1	England/Wales															No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_75	Gunfleet Sands Demo	Ørsted	Consented	499.7	499.2	1	England/Wales															No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_76	Gunfleet Sands II	Ørsted	Operational	501.1	500.6	1	England/Wales															No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_77	Dogger Bank South (West)	RWE Renewables	Planning application submitted	504.9	504.0	3	England/Wales															No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_78	Hornsea Project One	Ørsted	Operational	512.3	511.5	1	England/Wales															No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_79	Morven	Morven BP E1	Pre-planning application	514.6	513.6	3	Scotland															No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	f	No
OWF_80	Courseulles-sur-mer	Éolien Maritime France	Under construction	515.1	514.4	1	France															No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_81	London Array	Siemens Gamesa Renewable Energy	Operational	517.1	516.6	1	England/Wales															No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_82	Scroby Sands	E.ON UK	Operational	518.0	517.4	1	England/Wales															No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_83	Kincardine	Grupo Cobra	Operational	520.4	519.4	1	Scotland															No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_84	Fécamp	Éolien Maritime France	Under construction	527.1	526.5	1	France															No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_85	Bowdun	Cluaran Deas Ear DEME E3	Pre-planning application	528.0	527.0	3	Scotland															No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	f	No

OWF_86	Dogger Bank South (East)	RWE Renewables	Planning application submitted	530.3	529.4	3	England/Wales														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_87	Dogger Bank - Creyke Beck B	SSE / Equinor	Operational	530.9	530.0	1	England/Wales														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_88	Ossian	SSE Renewables-Marubeni-CIP E1	Planning application submitted	533.7	532.7	3	Scotland														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_89	Thanet	Vattenfall	Operational	534.3	533.7	1	England/Wales														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_90	Dogger Bank - Creyke Beck A	SSE / Equinor	Under construction	535.5	534.6	1	England/Wales														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_91	Aberdeen (EOWDC)	Vattenfall	Operational	536.2	535.3	1	Scotland														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_92	North Falls	North Falls Offshore Wind Farm Limited	Planning application submitted	536.8	536.3	3	England/Wales														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_93	Greater Gabbard	Airtricity / Fluor Ltd	Operational	538.8	538.3	1	England/Wales														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_94	Galloper	RWE Npower Renewables	Operational	543.7	543.2	1	England/Wales														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_95	East Anglia Two	Scottish Power Renewables	Consented	548.4	547.8	2	England/Wales														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_96	Hornsea Project Three	Ørsted	Consented	550.6	549.7	2	England/Wales														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_97	Norfolk Vanguard West	RWE (formerly Vattenfall / Scottish Power Renewables)	Consented	551.6	550.9	2	England/Wales														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_98	Five Estuaries	Five Estuaries Offshore Wind Farm Limited	Planning application submitted	553.3	552.8	3	England/Wales														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_99	East Anglia One North	Scottish Power Renewables	Consented	556.0	555.4	2	England/Wales														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_100	Dieppe Le Tréport	Ocean Winds	Under construction	561.4	560.7	1	France														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_101	Dogger Bank - Teesside B (Sofia)	RWE Renewables UK Limited	Under construction	565.3	564.3	1	England/Wales														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_102	Bellrock	Bellrock Falck Renewables E1	Pre-planning application	565.9	564.9	3	Scotland														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	f	No
OWF_103	East Anglia ONE	Scottish Power Renewables	Operational	569.4	568.8	1	England/Wales														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_104	Norfolk Boreas	Vattenfall Wind Power Ltd	Consented	581.3	580.6	2	England														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_105	Hywind	Statoil	Operational	581.7	580.7	1	Scotland														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_106	Norfolk Vanguard East	RWE (formerly Vattenfall / Scottish Power Renewables)	Consented	582.4	581.7	2	England/Wales														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_107	East Anglia Three	Scottish Power Renewables	Under construction	583.4	582.7	1	England/Wales														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_108	Flora	BP	Concept/Early Planning	588.1	587.1	3	Scotland														No	No	Yes	Yes	Yes	No	e	No	e	No	g	No	f	no
OWF_109	Dunkerque	EDF	Operational	590.0	589.5	1	France														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_110	Moray West	EDPR	Under construction	591.3	590.3	1	Scotland														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_111	Muir Mhòr	Muir Mhòr Fred Olsen E2	Planning application submitted	597.7	596.7	3	Scotland														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_112	Salamander	Simply Blue Energy (Scotland)	Consented	598.4	597.4	2	Scotland														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_113	Gebied 1 Noord (1-n)	Unknown	Planned	599.3	598.5	3	Netherlands														No	No	Yes	Yes	Yes	Yes	e	No	e	No	f	No	f	No
OWF_114	Groix et Belle-Île	Eolfi	Operational	600.2	599.6	1	France														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_115	Dogger Bank C - Teesside A	SSE / Equinor	Under construction	600.8	599.9	1	England/Wales														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_116	Campion	CampionWind Shell Wind Energy SPR E2	Pre-planning application	600.9	599.9	3	Scotland														~~No~~	~~No~~	~~Yes~~	~~Yes~~	~~Yes~~	No	e	No	e	No	g	No	f	No
OWF_117	Mermaid	Unknown	Operational	601.3	600.8	1	Belgium														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_118	Gebied 1 Zuid (1-z)	Unknown	Planned	601.6	600.8	3	Netherlands														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	f	No
OWF_119	Northwester 2	Parkwind	Operational	603.2	602.7	1	Belgium														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_120	Moray East	Diamond Green Limited, CTG & Ocean Winds	Operational	603.5	602.6	1	Scotland														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_121	Windenergiegebied Borssele Noordzijde / Zuidzijde (geographic planning zones)	Unknown	Pre-planning application	603.8	603.3	3	Netherlands														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	f	No
OWF_122	Windenergiegebied Borssele zuidzijde	Unknown	Pre-planning application	603.8	603.3	1	Netherlands														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_123	Borssele	Orsted	Operational	604.8	604.3	1	Netherlands														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_124	Borssele Kavel IV	Blauwwind	Operational	604.8	604.3	1	Netherlands														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_125	OWF Borssele IV	Blauwwind	Operational	604.8	604.3	1	Netherlands														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_126	Spiorad na Mara	Northland Power N4	Pre-planning application	605.0	604.1	3	Scotland														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	f	No
OWF_127	Caledonia	Caledonia Offshore Wind Farm Ocean Winds NE4	Planning application submitted	606.6	605.7	3	Scotland														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_128	Belwind phase 2 (Nobelwind)	Belwind Offshore Energy	Operational	607.2	606.7	1	Belgium														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_129	Sud de la Bretagne Extension	Unknown	Planned	607.9	607.2	3	France														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	f	No
OWF_130	Belwind phase 1	Belwind Offshore Energy	Operational	608.1	607.6	1	Belgium														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_131	Sud de la Bretagne	RTE	Pre-planning application	608.3	607.6	3	France														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	f	No
OWF_132	Cedar	Cerulean Winds	Pre-planning application	608.7	607.7	3	Scotland														Yes	Yes	Yes	Yes	Yes	Yes	e	No	e	No	g	No	f	No
OWF_133	Windenergiegebied Borssele noordzijde	Unknown	Operational	610.3	609.8	1	Netherlands														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_134	SeaStar	Unknown	Operational	611.7	611.2	1	Belgium														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_135	Beatrice	Scottish & Southern Energy (SSE) / Repsol / CIP	Operational	613.2	612.3	1	Scotland														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_136	IJmuiden Ver	TenneT	Planning application submitted	613.8	613.2	3	Netherlands														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_137	Borssele Kavel III	Unknown	Production	614.7	614.2	1	Netherlands														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_138	OWF Borssele III	Blauwwind	Operational	614.7	614.2	1	Netherlands														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_139	Northwind	Colruyt Group and Aspiravi Offshore	Operational	615.1	614.6	1	Belgium														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_140	Rentel	Otary	Operational	617.3	616.8	1	Belgium														No	No	Yes	Yes	Yes	Yes	e	No	e	No	f	No	g	No
OWF_141	OWF Borssele I	Orsted	Operational	618.3	617.8	1	Netherlands														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_142	C-Power (Zone A)	Blue Cluster	Operational	618.5	618.0	1	Belgium														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	g	No
OWF_143	Borssele Kavel V	Unknown	Operational	620.6	620.0	1	Netherlands														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	g	No
OWF_144	Borssele Kavel V	Blauwwind	Consented	620.6	620.1	2	Netherlands														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_145	IJmuiden Ver 2021 - Y-VER	Unknown	Planned	620.7	620.1	3	Netherlands														No	No	Yes	Yes	Yes	Yes	e	No	e	No	f	No	f	No
OWF_146	C-Power (Zone B)	Unknown	Operational	622.6	622.1	1	Belgium														No	No	Yes	Yes	Yes	Yes	e	No	e	No	f	No	f	No
OWF_147	Norther	Elicio NV, Eneco Wind Belgium SA and Diamond Generating Europe BV	Operational	623.1	622.6	1	Belgium														No	Yes	Yes	Yes	Yes	Yes	e	No	e	No	f	No	f	No
OWF_148	Hollandse Kust F	Vattenfall	Under construction	623.5	622.9	1	Netherlands														No	Yes	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	f	No
OWF_149	Borssele Kavel II	Unknown	Operational	624.6	624.1	1	Netherlands														No	Yes	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	f	No
OWF_150	OWF Borssele II	Orsted	Operational	624.7	624.1	1	Netherlands														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_151	Broadshore	Broadshore BlueFloat, Falck Renewables Ltd. NE6	Pre-planning application	632.1	631.2	3	Scotland														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	f	No
OWF_152	Aspen	Cerulean Winds	Planning application submitted	633.6	632.7	3	Scotland														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_153	Green Volt	Flotation Energy	Planning application submitted	635.0	634.0	3	Scotland														No	Yes	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	f	No
OWF_154	Hollandse Kust D	Unknown	Pre-planning application	636.8	636.1	3	Netherlands														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	f	No
OWF_155	Hollandse Kust West Zuidelijk Deel (HK-w-z)	Unknown	Pre-planning application	638.6	638.0	3	Netherlands														No	Yes	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	f	No
OWF_156	Gebied 2 Noord (2-n)	Unknown	Planned	639.5	638.8	3	Netherlands														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	f	No
OWF_157	HKW Kavel VII	Unknown	Approved	640.4	639.8	1	Netherlands														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	g	No
OWF_158	HKW Noord – HKW-N	Unknown	Pre-planning application	640.4	639.8	3	Netherlands														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	f	No
OWF_159	Hollandse Kust (West)	Ecowende	Consented	642.3	641.6	1	Netherlands														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_160	Scaraben	Bluefloat Energy/Renanis Partnership	Pre-planning application	644.7	643.8	3	Scotland														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_161	Sinclair	Bluefloat Energy/Renanis Partnership	Pre-planning application	646.3	645.3	3	Scotland														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_162	Talisk	Magnora-Technip N3	Pre-planning application	646.7	645.8	3	Scotland														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_163	HKW Kavel VI	Unknown	Construction	649.0	648.3	1	Netherlands														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_164	Pentland Floating	Hexicon AB / COP	Consented	649.3	648.5	2	Scotland														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_165	Cenos	Flotation Energy	Planning application submitted	649.6	648.6	3	Scotland														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_166	Saint-Nazaire	Éolien Maritime France	Operational	652.1	651.4	1	France														No	Yes	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_167	Marram	MaramWind SPR Shell Wind Ltd. NE7	Pre-planning application	652.4	651.4	3	Scotland														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_168	Gebied 2 Zuid (2-z)	Unknown	Planned	652.6	651.9	3	Netherlands														No	No	Yes	Yes	Yes	Yes	e	No	e	No	f	No	f	No
OWF_169	Havbredey	Northland Power N2	Pre-planning application	653.3	652.4	3	Scotland														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_170	Stromar	Stromar BlueFloat Energy,Falck Renewables Limited,Ørsted A/S NE3	Pre-planning application	653.9	652.9	3	Scotland														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_171	West of Orkney	West of Orkney Total Energies N1	Pre-planning application	659.0	658.1	3	Scotland														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_172	Buchan	Floating Energy Allyance Elicio nv, Baywar r.e., BW Ideol NE8	Pre-planning application	661.1	660.1	3	Scotland														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_173	Hollandse Kust E	Unknown	Pre-planning application	666.7	666.1	3	Netherlands														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_174	HKZ Kavel II	Unknown	Construction	668.0	667.4	1	Netherlands														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_175	HKZ Kavel I	Unknown	Construction	668.1	667.5	1	Netherlands														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_176	Hollandse Kust (Zuid)	Vattenfall	Operational	668.2	667.6	1	Netherlands														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_177	HKZ Kavel III	Unknown	Construction	670.9	670.3	1	Netherlands														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_178	HKZ Kavel I – IV	Unknown	Operational	676.4	675.8	1	Netherlands														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_179	Hollandse Kust (Noord)	Eneco	Operational	677.3	676.7	1	Netherlands														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No

OWF_180	HKN Kavel V	Unknown	Operational	677.6	676.9	1	Netherlands														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_181	WP Q10 / Eneco Luchterduinen	Unknown	Operational	680.2	679.6	1	Netherlands														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_182	OWF Luchterduinen	Eneco	Operational	680.4	679.8	1	Netherlands														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_183	OWF Prinses Amalia	Eneco	Operational	681.5	680.9	1	Netherlands														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_184	EN19	Unknown	Planned	682.3	681.3	3	Germany														No	No	Yes	Yes	Yes	Yes	e	No	e	No	f	No	f	No
OWF_185	Iles d'Yeu et de Noirmoutier	Eoliennes en Mer des îles d'Yeu et de Noirmoutier	Consented	682.7	682.0	1	France														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_186	Les deux oles	Unknown	Approved	682.8	682.1	3	France														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_187	Culzean	TotalEnergies E&P UK	Pre-planning application	686.6	685.6	3	Scotland														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_188	Ayre	Cluaran Ear-Thuath NE2	Pre-planning application	690.5	689.5	3	Scotland														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_189	OWF Egmond aan Zee	Shell	Operational	692.1	691.4	1	Netherlands														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_190	Harbour Energy South	Harbour Energy	Pre-planning application	711.9	710.9	3	Scotland														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_191	EN17	Unknown	Planned	717.9	716.9	3	Germany														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	f	No
OWF_192	Beech	Cerulean Winds	Pre-planning application	721.0	720.0	3	Scotland														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_193	EN20	Unknown	Planned	740.0	739.1	3	Germany														Yes	Yes	Yes	Yes	Yes	Yes	e	No	e	No	g	No	f	No
OWF_194	EN15	Unknown	Planned	743.0	742.1	3	Germany														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	f	No
OWF_195	EN14	Unknown	Planned	743.1	742.3	3	Germany														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	f	No
OWF_196	EN18	Unknown	Planned	747.7	746.7	3	Germany														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	f	No
OWF_197	Ten Noorden van de Wadden	TenneT	Pre-planning application	748.6	747.8	3	Netherlands														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_198	Gebied 5 Oost (5-o)	Unknown	Operational	756.0	755.2	1	Netherlands														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_199	EN9	Unknown	Planned	772.4	771.5	3	Germany														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	f	No
OWF_200	N-9.3	Not available	Pre-planning application	772.8	772.0	3	Germany														No	No	Yes	Yes	Yes	Yes	e	No	e	No	f	No	g	No
OWF_201	EN16	Unknown	Planned	772.9	772.0	3	Germany														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	f	No
OWF_202	N-9.1	Not available	Pre-planning application	778.4	777.6	3	Germany														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_203	N-9.4	Not available	Pre-planning application	782.9	782.1	3	Germany														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_204	EN6	Unknown	Planned	783.5	782.6	3	Germany														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	f	No
OWF_205	N-6.7	Not available	Pre-planning application	783.9	783.1	3	Germany														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_206	Deutsche Bucht	Northland Power	Operational	785.4	784.6	1	Germany														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_207	ZeeEnergie / Gemini II	Northland Power	Operational	787.3	786.5	1	Netherlands														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_208	Veja Mate	Veja Mate Offshore Project	Operational	790.5	789.7	1	Germany														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_209	N-6.6	Not available	Pre-planning application	790.7	789.9	3	Germany														No	No	Yes	Yes	Yes	Yes	e	No	e	No	f	No	g	No
OWF_210	N-9.2	Not available	Pre-planning application	791.8	791.0	3	Germany														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_211	BARD Offshore 1	Ocean Breeze Energy	Operational	798.1	797.3	1	Germany														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_212	EN10	Unknown	Planned	798.5	797.7	3	Germany														No	No	Yes	Yes	Yes	Yes	e	No	e	No	f	No	f	No
OWF_213	Buitengaats / Gemini I	Northland Power	Operational	798.9	798.1	1	Netherlands														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_214	N-10.2	Not available	Pre-planning application	799.0	798.2	3	Germany														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	g	No
OWF_215	EN1	Unknown	Planned	804.0	803.2	3	Germany														No	Yes	Yes	Yes	Yes	Yes	e	No	e	No	f	No	f	No
OWF_216	Borkum Riffgrund West II	Unknown	Approved	804.3	803.5	3	Germany														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_217	Borkum Riffgrund 3	Orsted	Under construction	804.7	803.9	1	Germany														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_218	EN12	Unknown	Planned	804.8	803.9	3	Germany														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	f	No
OWF_219	Sud Atlantique	RTE	Pre-planning application	805.4	804.7	3	France														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_220	OWP West (new Borkum Riffgrund expansion)	Unknown	Under construction	805.8	805.0	1	Germany														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_221	Nordsren III vest	RWE	Pre-planning application	807.8	806.9	3	Denmark														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_222	N-10.1	Not available	Pre-planning application	808.1	807.2	3	Germany														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_223	EN7	Unknown	Planned	809.1	808.3	3	Germany														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	f	No
OWF_224	N-7.2	Not available	Pre-planning application	809.7	808.9	3	Germany														No	No	Yes	Yes	Yes	Yes	e	No	e	No	f	No	g	No
OWF_225	Borkum Riffgrund West	Unknown	Approved	810.6	809.8	3	Germany														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_226	EnBW He Dreiht	EnBW	Consented	811.0	810.2	1	Germany														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_227	Borkum Riffgrund West II	Unknown	Planned	813.1	812.3	3	Germany														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	f	No
OWF_228	EN8	Unknown	Planned	816.6	815.7	3	Germany														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	f	No
OWF_229	Albatros	EnBW	Operational	817.7	816.9	1	Germany														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_230	EnBW Hohe See	EnBW	Operational	820.9	820.1	1	Germany														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_231	GlobalTech I	Global Tech I Offshore Wind GmbH	Operational	825.3	824.5	1	Germany														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	g	No
OWF_232	EN11	Unknown	Planned	825.7	824.8	3	Germany														No	No	Yes	Yes	Yes	Yes	e	No	e	No	f	No	f	No
OWF_233	EN2	Unknown	Planned	825.9	825.1	3	Germany														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	f	No
OWF_234	Riffgat	EWE	Operational	826.4	825.7	1	Germany														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_235	Trianel Windpark Borkum Phase 2	Trianel	Operational	826.7	825.9	1	Germany														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_236	Borkum Riffgrund 2	Orsted	Operational	826.7	825.9	1	Germany														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_237	Trianel Windpark Borkum Phase 1	Trianel	Operational	826.9	826.1	1	Germany														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_238	EN13	Unknown	Planned	829.5	828.6	3	Germany														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	f	No
OWF_239	Nordsren II vest	Equinor	Pre-planning application	829.8	828.9	3	Denmark														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_240	Borkum Riffgrund 1	Orsted	Operational	831.2	830.4	1	Germany														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	g	No
OWF_241	Merkur Offshore (MEG Offshore I)	GE Renewable Energy	Operational	832.3	831.5	1	Germany														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_242	Alpha Ventus	Deutsche Offshore-Testfeld und Infrastruktur-GmbH & Co. KG	Operational	838.1	837.3	1	Germany														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_243	EN13-Nord	Unknown	Planned	844.7	843.8	3	Germany														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	f	No
OWF_244	EN3	Unknown	Planned	847.2	846.4	3	Germany														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	f	No
OWF_245	Nordsee One	GmbH	Operational	848.0	847.2	1	Germany														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_246	N-3.6	Not available	Pre-planning application	848.2	847.4	3	Germany														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	g	No
OWF_247	N-3.5	Not available	Pre-planning application	852.5	851.7	3	Germany														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	g	No
OWF_248	N-3.8	Not available	Pre-planning application	853.6	852.8	3	Germany														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	g	No
OWF_249	Gode Wind 01	Orsted	Operational	860.9	860.1	1	Germany														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OWF_250	Nordsren II	Unknown	Planned	861.1	860.2	3	Denmark														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	f	No
OWF_251	Gode Wind 02	Orsted	Operational	861.5	860.7	1	Germany														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	g	No
OWF_252	N-3.7	Not available	Pre-planning application	866.2	865.4	3	Germany														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	g	No
OWF_253	Arven	Mainstream Renewable Power / OceanWinds	Pre-planning application	868.3	867.3	3	Scotland														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_254	Nordsren III	Not available	Pre-planning application	868.4	867.5	3	Denmark														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	g	No
OWF_255	Gode Wind 3	Orsted	Consented	869.0	868.2	1	Germany														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_256	EN5	Unknown	Planned	870.0	869.1	3	Germany														No	No	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	f	No
OWF_257	Sandbank	Vattenfall	Operational	870.7	869.8	1	Germany														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	g	No
OWF_258	Nordsøen I	Not available	Pre-planning application	885.5	884.6	3	Denmark														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	g	No
OWF_259	Dan Tysk	Vattenfall	Operational	889.6	888.7	1	Germany														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	g	No
OWF_260	Jyske Banke	Unknown	Cancelled	902.4	901.5	n/a	Denmark														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	g	No
OWF_261	Stoura	ESB Asset Development	Pre-planning application	906.2	905.3	3	Scotland														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	g	No
OWF_262	EN4	Unknown	Planned	908.3	907.5	3	Germany														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	f	No
OWF_263	Meerwind Sued/Ost	WindMW	Operational	909.3	908.5	1	Germany														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	g	No
OWF_264	Nordsee Ost	RWE	Operational	909.7	908.9	1	Germany														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	g	No
OWF_265	Kaskasi II	rWE	Operational	910.6	909.8	1	Germany														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	g	No
OWF_266	Amrumbank West	E.ON Climate & Renewables	Operational	910.9	910.0	1	Germany														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	g	No
OWF_267	Horns Rev II	Orsted	Operational	923.8	922.9	1	Denmark														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	g	No
OWF_268	Butendiek	WPD	Operational	924.3	923.5	1	Germany														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	g	No
OWF_269	Horns Rev III	Vattenfall	Operational	928.7	927.8	1	Denmark														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	g	No
OWF_270	Thor	RWE	Consented	933.1	932.2	1	Denmark														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	g	No
OWF_271	Horns Rev I	Vattenfall	Operational	937.7	936.8	1	Denmark														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	g	No
OWF_272	Nordergruende	WPD	Operational	940.3	939.5	1	Germany														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	g	No
OWF_273	Fanm Bugt	European Energy (Denmark)	Pre-planning application	944.1	943.2	3	Denmark														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	g	No
OWF_274	Vesterhav Syd	Vattenfall	Operational	961.1	960.2	1	Denmark														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	g	No
OWF_275	ZAPER_NOR_2	Unknown	Planned	966.8	966.3	3	Spain														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	f	No
OWF_276	ZAPER_NOR_3	Unknown	Planned	967.6	967.1	3	Spain														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	f	No
OWF_277	ZAPER_NOR_5	Unknown	Planned	969.1	968.5	3	Spain														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	f	No
OWF_278	ZAPER_NOR_4	Unknown	Planned	970.9	970.4	3	Spain														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	f	No
OWF_279	ZAPER_NOR_6	Unknown	Planned	972.3	971.7	3	Spain														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	f	No
OWF_280	ZAPER_NOR_7	Unknown	Planned	974.6	974.0	3	Spain														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	f	No

OWF_281	ZAPER_NOR_8	Unknown	Planned	977.7	977.2	3	Spain														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	f	No
OWF_282	Vesterhav Nord	Vattenfall	Operational	981.8	980.9	1	Denmark														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	g	No
OWF_283	Renland	Harboøre Møllelaug I/S	Operational	998	997	1	Denmark														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	g	No
OWF_284	Nissum Bredning	Jysk Energy & Nissum Brednings	Operational	999.3	998.4	1	Denmark														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	g	No
OWF_285	Biscay Marine Energy Park (BIMEP)	Unknown	Operational	1047.9	1047.2	1	Spain														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	g	No
OWF_286	Lillebklt Syd	Unknown	Planned	1051.2	1050.3	1	Denmark														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	f	No
OWF_287	Lillebklt Syd	Unknown	Planned	1052.1	1051.2	1	Denmark														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	f	No
OWF_288	Jammerbugt	Unknown	Cancelled	1067.9	1066.9	n/a	Denmark														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	g	No
OWF_289	Jammerland Bay Nearshore Wind Farm	European Energy	Pre-planning application	1069.2	1068.3	3	Denmark														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	g	No
OWF_290	Motriku	Unknown	Operational	1074.5	1073.8	1	Spain														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	g	No
OWF_291	Tunm Knob	Unknown	Operational	1104.6	1103.7	1	Denmark														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	g	No
OWF_292	Mejl Flak	Unknown	Operational	1105.2	1104.3	1	Denmark														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	g	No
OWF_293	Paludan Flak	Unknown	Planned	1113.4	1112.6	3	Denmark														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	f	No
OWF_294	Samsa	Unknown	Operational	1113.8	1112.9	1	Denmark														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	g	No
OWF_295	Sprogo	Unknown	Operational	1130.2	1129.3	1	Denmark														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	g	No
OWF_296	Omo Syd	Unknown	Planned	1134.6	1133.8	3	Denmark														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	f	No
OWF_297	Trem MKllebugt	Unknown	Planned	1142.3	1141.3	3	Denmark														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	f	No
OWF_298	Kattegat I	Unknown	Cancelled	1155.9	1155.0	n/a	Denmark														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	g	No
OWF_299	Rodsand II	Unknown	Operational	1156.8	1155.9	1	Denmark														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	g	No
OWF_300	Kattegat II	Unknown	Pre-planning application	1158.9	1158.0	3	Denmark														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	g	No
OWF_301	Frederikshavn Offshore	Unknown	Operational	1159.3	1158.4	1	Denmark														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	g	No
OWF_302	Frederikshavn Offshore Demo	Unknown	Planned	1162.1	1161.1	3	Denmark														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	f	No
OWF_303	Anholt	Unknown	Operational	1167.6	1166.7	1	Denmark														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	g	No
OWF_304	Nysted	Unknown	Operational	1170.3	1169.4	1	Denmark														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	g	No
OWF_305	Frederikshavn	Unknown	Operational	1172.9	1172.0	1	Denmark														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	g	No
OWF_306	Poseidon	Unknown	Consented	1193.6	1192.6	2	Sweden														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	g	No
OWF_307	Hesselk	Unknown	Pre-planning application	1194.7	1193.8	2	Denmark														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_308	Hesselk	Unknown	Planned	1194.7	1193.8	3	Denmark														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	f	No
OWF_309	ZAPER_NOR_1	Unknown	Planned	1213.1	1212.6	3	Spain														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	f	No
OWF_310	Galatea-Galene	Unknown	Consented	1215.5	1214.6	2	Sweden														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_311	Kattegat Syd	Vattenfall	Consented	1219.0	1218.1	2	Sweden														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_312	Kadetbanke	Unknown	Planned	1219.3	1218.5	3	Denmark														No	No	Yes	Yes	Yes	No	e	No	e	No	g	No	f	No
OWF_313	Gennaker	Unknown	Approved	1221.4	1220.6	3	Germany														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_314	V302	Unknown	Planned	1222.2	1221.2	3	Sweden														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	f	No
OWF_315	Stora Middelgrund	Vattenfall AB (Sweden)	Cancelled	1222.2	1221.3	n/a	Sweden														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_316	WindFloat Atlantic	Unknown	Operational	1227.6	1227.1	1	Portugal														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	g	No
OWF_317	Avedøre Holme	Unknown	Operational	1228.7	1227.8	1	Denmark														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_318	Aflandshage	Unknown	Planned	1230.2	1229.3	3	Denmark														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	f	No
OWF_319	EnBW Windpark Baltic 1	Unknown	Operational	1232.6	1231.7	1	Germany														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	g	No
OWF_320	EnBW Baltic I	Unknown	Approved	1235.9	1235.0	3	Germany														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_321	V317	Unknown	Planned	1236.0	1235.0	3	Sweden														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	f	No
OWF_322	Krigers Flak Nord	Unknown	Planned	1237.7	1236.9	3	Denmark														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	f	No
OWF_323	Krigers Flak Syd	Unknown	Planned	1238.5	1237.7	3	Denmark														No	No	Yes	Yes	Yes		e	No	e	No	f	No	f	No
OWF_324	Kriegers Flak	Unknown	Operational	1242.1	1241.3	1	Denmark														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OWF_325	Kattegatt Offshore	Green Investment Group	Consented	1242.5	1241.6	2	Sweden														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	g	No
OWF_326	Middelgrunden	Unknown	Operational	1243.0	1242.1	1	Denmark														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	g	No
OWF_327	V305	Unknown	Planned	1243.0	1242.1	3	Sweden														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	f	No
OWF_328	Ö287	Unknown	Planned	1246.7	1245.8	3	Sweden														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	f	No
OWF_329	Nordre Flint	Unknown	Planned	1252.8	1251.9	3	Denmark														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	f	No
OWF_330	Lovstaviken	Falkenberg Energi AB (Sweden)	Operational	1253.6	1252.7	1	Sweden														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	g	No
OWF_331	Ö285	Unknown	Planned	1257.1	1256.3	3	Sweden														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	f	No
OWF_332	EnBW Windpark Baltic 2	Unknown	Operational	1263.0	1262.1	1	Germany														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	g	No
OWF_333	EO3	Unknown	Planned	1263.1	1262.3	3	Germany														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	f	No
OWF_334	Gruissan	Unknown	Construction	1275.4	1274.7	3	France														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	g	No
OWF_335	Méditerranée	Unknown	Planned	1276.4	1275.7	3	France														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	f	No
OWF_336	Méditerranée	Unknown	Planned	1276.4	1275.7	3	France														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	f	No
OWF_337	Leucate-Le Barcarès	Unknown	Test site	1288.7	1288.0	1	France														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	g	No
OWF_338	Méditerranée	Unknown	Planned	1290.9	1290.2	3	France														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	f	No
OWF_339	ARCADIS Ost 1	Unknown	Construction	1294.0	1293.1	3	Germany														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	g	No
OWF_340	EO2-West	Unknown	Planned	1297.2	1296.3	3	Germany														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	f	No
OWF_341	EO2	Unknown	Planned	1301.4	1300.6	3	Germany														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	f	No
OWF_342	Baltic Eagle	Unknown	Construction	1308.6	1307.8	1	Germany														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	g	No
OWF_343	EO1	Unknown	Planned	1320.8	1319.9	3	Germany														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	f	No
OWF_344	Faraman-Port-Saint-Louis-du-Rhône	Unknown	Test site	1322.3	1321.6	3	France														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	g	No
OWF_345	Wikinger	Unknown	Operational	1323.0	1322.2	1	Germany														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	g	No
OWF_346	Bornholm I	Unknown	Planned	1324.6	1323.7	3	Denmark														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	f	No
OWF_347	Arkona-Becken Südost	Unknown	Operational	1324.9	1324.0	1	Germany														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	g	No
OWF_348	Bornholm II	Unknown	Planned	1347.8	1347.0	3	Denmark														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	f	No
OWF_349	Bornholm I	Unknown	Planned	1352.4	1351.6	3	Denmark														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	f	No
OWF_350	Bornholm	Unknown	Planned	1360.1	1359.2	3	Denmark														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	f	No
OWF_351	ZAPER_LEBA_1	Unknown	Planned	1360.7	1360.0	3	Spain														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	f	No
OWF_352	Bornholm III	Unknown	Planned	1376.2	1375.4	3	Denmark														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	f	No
OWF_353	PZP_14	Unknown	Planned	1382.6	1381.8	3	Poland														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	f	No
OWF_354	NW Grund	Unknown	Planned	1396.1	1395.3	3	Denmark														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	f	No
OWF_355	PZP_43	Unknown	Planned	1456.7	1455.8	3	Poland														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	f	No
OWF_356	PZP_44	Unknown	Planned	1473.4	1472.5	3	Poland														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	f	No
OWF_357	PZP_53	Unknown	Planned	1487.5	1486.7	3	Poland														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	f	No
OWF_358	PZP_45	Unknown	Planned	1497.4	1496.5	3	Poland														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	f	No
OWF_359	Ö248	Unknown	Planned	1522.1	1521.3	3	Sweden														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	f	No
OWF_360	PZP_60	Unknown	Planned	1522.8	1521.9	3	Poland														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	f	No
OWF_361	PZP_46	Unknown	Planned	1556.8	1556.0	3	Poland														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	f	No
OWF_362	ZAPER_LEBA_2	Unknown	Planned	1597.3	1596.6	3	Spain														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	f	No
OWF_363	ZAPER_LEBA_3	Unknown	Planned	1627.3	1626.6	3	Spain														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	f	No
OWF_364	B146	Unknown	Planned	1669.3	1668.3	3	Sweden														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	f	No
OWF_365	B152	Unknown	Planned	1672.2	1671.2	3	Sweden														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	f	No
OWF_366	B151	Unknown	Planned	1682.9	1681.9	3	Sweden														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	f	No
OWF_367	E1	Unknown	Planned	1694.3	1693.4	3	Latvia														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	f	No
OWF_368	B142	Unknown	Planned	1697.6	1696.6	3	Sweden														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	f	No
OWF_369	Lithuanian Tender 1 & 2	Unknown	Planned	1716.1	1715.2	3	Lithuania														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	f	No
OWF_370	Plotas A	Unknown	Planned	1716.1	1715.2	3	Lithuania														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	f	No
OWF_371	B143	Unknown	Planned	1716.5	1715.5	3	Sweden														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	f	No
OWF_372	Plotas B	Unknown	Planned	1716.9	1716.0	3	Lithuania														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	f	No
OWF_373	Plotas C	Unknown	Planned	1717.2	1716.4	3	Lithuania														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	f	No
OWF_374	Plotas B2	Unknown	Planned	1717.6	1716.7	3	Lithuania														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	f	No
OWF_375	Plotas C2	Unknown	Planned	1717.7	1716.8	3	Lithuania														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	f	No
OWF_376	B147	Unknown	Planned	1720.9	1719.9	3	Sweden														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	f	No
OWF_377	I etapu vystomas plotas	Unknown	Planned	1723.3	1722.4	3	Lithuania														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	f	No
OWF_378	E2	Unknown	Planned	1736.6	1735.7	3	Latvia														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	f	No
OWF_379	E3	Unknown	Planned	1738.3	1737.3	3	Latvia														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	f	No
OWF_380	E4	Unknown	Planned	1749.2	1748.3	3	Latvia														No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	f	No
OWF_381	ZAPER_ESAL_2	Unknown	Planned	1792.9	1792.2	3	Spain														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	f	No
OWF_382	ZAPER_ESAL_1	Unknown	Planned	1810.6	1810.0	3	Spain														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	f	No
OWF_383	E5	Unknown	Planned	1941.4	1940.5	3	Latvia														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	f	No
OWF_384	B108	Unknown	Planned	1973.5	1972.5	3	Sweden														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	f	No
OWF_385	B107	Unknown	Planned	1977.1	1976.1	3	Sweden														No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	f	No

OWF_386	ZAPER_CAN_LANZ1	Unknown	Planned	2680.3	2679.7	3	Spain															No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	f	No
OWF_387	ZAPER_CAN_FV2	Unknown	Planned	2760.5	2760.0	3	Spain															No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	f	No
OWF_388	ZAPER_CAN_FV1	Unknown	Planned	2774.7	2774.1	3	Spain															No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	f	No
OWF_389	ZAPER_CAN_TEN2	Unknown	Planned	2842.2	2841.7	3	Spain															No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	f	No
OWF_390	ZAPER_CAN_GC1	Unknown	Planned	2851.4	2850.9	3	Spain															No	No	Yes	Yes	Yes	No	e	No	e	No	f	No	f	No
OWF_391	ZAPER_CAN_TEN1	Unknown	Planned	2871.4	2870.9	3	Spain															No	No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	f	No
OWF_392	Valorous Offshore Wind Farm	Blue Gem Wind	Planned	141.9	141.3	3	England / Wales															Yes	Yes	Yes	Yes	Yes	Yes	e	No	e	No	f	No	c	Yes

Offshore Cumulative Effects Assessment Matrix - Alternative Offshore Renewable Energy (Wave/Tidal) - Celtic Sea Region

Other Development Details									Phases of Other Developments in relation to the construction phase of the Proposed Development (denoted in red)														Stage 1				Stage 2								
ID	Project	Developer	Type	Status	Distance to the Proposed Development Array Area (km)	Distance to the Proposed Development Cable Corridor and Working Area (km)	Tier	Region	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	Project located within ICES Celtic Sea 7a	ICES Celtic Sea	Within ZoI for at least one topic?	Progress to Stage 2?	Overlap in temporal scope?	Benthic Subtidal and Intertidal Ecology		Fish, Shellfish and Sea Turtle Ecology		Marine Mammals		Offshore Ornithology	
																												Potential LSE Criteria	Progress to Stage 3/4?	Potential LSE Criteria	Progress to Stage 3/4?	Potential LSE Criteria	Progress to Stage 3/4?	Potential LSE Criteria	Progress to Stage 3/4?
OOE_01	Holyhead Deep	Minesto UK Ltd	Tidal	Consented	84.0	83.1	2	Wales															Yes	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OOE_02	Holyhead Deep 0.5MW Site	Minesto UK Ltd	Tidal	Operational	84.3	83.3	1	Wales															Yes	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OOE_03	West Anglesey Demonstration Zone	Menter Môn Morlais Ltd	Tidal	Consented	85.0	84.1	2	Wales															Yes	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OOE_04	Ramsey Sound	Cambrian Offshore Ltd	Tidal	Decommissioned	98.2	97.5	2	Wales															Yes	Yes	Yes	Yes	No	e	No	e	No	f	No	g	No
OOE_05	Wave Dragon Project - Milla Fjord Site	Wave Dragon Wales Ltd	Wave	Cancelled	121.2	121.9	n/a	Wales															~~Yes~~	~~Yes~~	~~Yes~~	~~Yes~~	No	e	No	e	No	f	No	g	No
OOE_06	Milford Haven Estuary (META Phase 2) - Dale Roads	Pembrokeshire Coastal Forum Community Interest Company	Tidal	Operational	121.3	120.6	1	Wales															Yes	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OOE_07	Milford Haven Estuary (META Phase 2) - East Pickard Bay	Pembrokeshire Coastal Forum Community Interest Company	Tidal	Operational	126.1	125.4	1	Wales															Yes	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OOE_08	Marine Energy Test Areas (META)	Pembrokeshire Coastal Forum CiC	Wave	Operational	128.6	127.9	1	Wales															Yes	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OOE_09	Milford Haven Estuary (META Phase 2) - Warrior Way	Pembrokeshire Coastal Forum Community Interest Company	Tidal	Operational	129.2	128.5	1	Wales															Yes	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OOE_10	North Wales Tidal Energy	North Wales Tidal Energy & Coastal Protection (NWTE)	Tidal	Pre-planning application	144.1	145.0	3	Wales															Yes	Yes	Yes	Yes	No	e	No	e	No	d	No	g	No
OOE_11	Pembrokeshire Demonstration Zone	Wave Hub Development Services Ltd	Wave	Pre-planning application	144.3	143.7	3	Wales															Yes	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
OOE_12	Colwyn bay tidal lagoon	Tidal Lagoon Power Ltd	Tidal	Pre-planning application	153.2	152.3	3	Wales															Yes	Yes	Yes	Yes	No	e	No	e	No	d	No	g	No
OOE_13	Strangford Lough	Minesto UK Ltd	Tidal	Decommissioned	164.9	164.0	3	Northern Ireland															Yes	Yes	Yes	Yes	No	e	No	e	No	g	No	g	No
OOE_14	Mersey Tidal Power	Mersey Tidal Power	Tidal	Pre-planning application	202.1	201.3	3	England															Yes	Yes	Yes	Yes	No	e	No	e	No	f	No	g	No
OOE_15	Mull of Galloway	Atlantis Resources Ltd	Tidal	Cancelled	203.3	202.3	n/a	Scotland															~~Yes~~	~~Yes~~	~~Yes~~	~~Yes~~	No	e	No	e	No	f	No	g	No
OOE_16	Wyre Barrage	Wyre Tidal Energy	Tidal	Pre-planning application	221.9	222.8	3	England															No	Yes	Yes	Yes	No	e	No	e	No	f	No	g	No
OOE_17	Northern Tidal Power Gateways/Morecambe Bay Tidal Lagoon	North West Energy Squared	Tidal	Pre-planning application	222.3	223.2	3	England															No	Yes	Yes	Yes	No	e	No	e	No	f	No	g	No
OOE_18	West Cumbrian Tidal Lagoon	Tidal Lagoon Power Ltd	Tidal	Pre-planning application	227.3	228.3	3	England															No	Yes	Yes	Yes	No	e	No	e	No	f	No	g	No
OOE_19	West Somerset Tidal Lagoon	Longbay Seapower	Tidal	Pre-planning application	235.8	236.5	3	England															No	Yes	Yes	Yes	No	e	No	e	No	g	No	g	No
OOE_20	Severn Barrage	REUK Renewable Energy UK	Tidal	Pre-planning application	237.4	238.1	3	England/Wales															No	Yes	Yes	Yes	No	e	No	e	No	f	No	g	No
OOE_21	Cardiff Bay Tidal Lagoon	Cardiff Tidal Lagoon	Tidal	Cancelled	241.4	242.1	n/a	Wales															~~No~~	~~Yes~~	~~Yes~~	~~Yes~~	No	e	No	e	No	g	No	g	No
OOE_22	Newport Tidal Lagoon	Tidal Lagoon Power Ltd	Tidal	Cancelled	241.4	242.1	n/a	Wales															~~No~~	~~Yes~~	~~Yes~~	~~Yes~~	No	e	No	e	No	f	No	g	No
OOE_23	WestWave Demonstration Project	ESB	Wave	Cancelled	252.5	244.2	n/a	Ireland															~~No~~	~~Yes~~	~~Yes~~	~~Yes~~	No	e	No	e	No	f	No	g	No
OOE_24	Bridgewater Bay Tidal Lagoon	Tidal Lagoon Power Ltd	Tidal	Pre-planning application	254.4	255.1	3	England															No	Yes	Yes	Yes	No	e	No	e	No	f	No	g	No
OOE_25	Wave Hub	Wave Hub Ltd	Wave	Operational	262.9	263.5	1	England															No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OOE_26	Fair Head Phase 1	Fair Head Tidal Energy Park Ltd	Tidal	Planning application submitted	290.9	291.9	2	Northern Ireland															No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OOE_27	Fair Head Phase 2	Fair Head Tidal Energy Park Ltd	Tidal	Pre-planning application	290.9	291.9	3	Northern Ireland															No	Yes	Yes	Yes	No	e	No	e	No	g	No	g	No
OOE_28	Falmouth Bay Test Site (FaBTest)	Falmouth Harbour Comissioners	Wave	Operational	292.0	291.4	1	England															No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OOE_29	West Islay Tidal Energy Park	Bluepower	Tidal	Consented but inactive	309.0	310.0	2	Scotland															No	Yes	Yes	Yes	No	e	No	e	No	g	No	g	No
OOE_30	Sound of Islay	Previously ScottishPower Renewables UK Ltd, now Atlantis (2016 purchase)	Tidal	Consented but inactive	323.1	322.2	2	Scotland															No	Yes	Yes	Yes	No	e	No	e	No	g	No	g	No
OOE_31	Oran na Mara	Oran na Mara Ltd	Tidal	Pre-planning application	327.6	326.7	3	Scotland															No	Yes	Yes	Yes	No	e	No	e	No	g	No	g	No
OOE_32	Portland Bill	Marine Current Turbines Ltd	Tidal	Cancelled	342.1	342.8	n/a	England															~~No~~	~~Yes~~	~~Yes~~	~~Yes~~	No	e	No	e	No	g	No	g	No
OOE_33	Connel	Sustainable Marine Energy Ltd	Tidal	Decommissioned	395.1	394.2	3	Scotland															No	Yes	Yes	Yes	No	e	No	e	No	g	No	g	No
OOE_34	Perpetuus Tidal Energy Centre (PTEC)	Isle of Wight Council	Tidal	Under construction	399.3	398.7	1	England															No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OOE_35	Raz Blanchard	SIMEC Atlantic	Tidal	Consented	432.3	433.0	2	France															No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OOE_36	Isle of Muck	Albatern WaveNET Albatern and Marine Harvest Scotland	Wave	Operational	437.2	436.3	1	Scotland															No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OOE_37	Inner Sound	MeyGen Ltd	Tidal	Operational	661.8	660.9	1	Scotland															No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OOE_38	Ness of Duncansby	Orbital Projects 6 Ltd	Tidal	Pre-planning application	663.2	662.3	3	Scotland															No	Yes	Yes	Yes	No	e	No	e	No	g	No	g	No
OOE_39	EMEC Scapa Flow	The European Marine Energy	Wave	Operational	689.5	688.6	1	Scotland															No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OOE_40	EMEC Bilia Croo	The European Marine Energy	Wave	Operational	690.6	689.7	1	Scotland															No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OOE_41	Deer Sound	Orbital Marine Power (Orkney)	Tidal	Operational	700.1	699.2	1	Scotland															No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OOE_42	EMEC Shapinsay Sound	The European Marine Energy	Tidal	Operational	702.6	701.7	1	Scotland															No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OOE_43	Morlais Orbital O2	Orbital Marine Power	Tidal	Consented	717.2	718.1	2	Wales															No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OOE_44	EMEC Fall of Warness	The European Marine Energy	Tidal	Operational	717.6	716.7	1	Scotland															No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
OOE_45	Westray South	Orbital Projects 5 Ltd	Tidal	Pre-planning application	720.2	719.3	3	Scotland															No	Yes	Yes	Yes	No	e	No	e	No	g	No	g	No
OOE_46	Yell Sound Array	Nova Innovation Ltd	Tidal	Pre-planning application	890.7	889.7	3	Scotland															No	Yes	Yes	Yes	No	e	No	e	No	g	No	g	No

Offshore Cumulative Effects Assessment Matrix - Subsea Cables - Celtic Sea Region

Other Development Details									Phases of Other Developments in relation to the construction phase of the Proposed Development (denoted in red)														Stage 1				Stage 2							
ID	Project	Company	Type	Status	Distance to the Proposed Development Array Area (km)	Distance to the Proposed Development Cable Corridor and Working Area (km)	Tier	Region	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	ICES Celtic Sea 7a	ICES Celtic Sea	Within ZoI for at least one topic?	Progress to Stage 2?	Overlap in temporal scope?	Benthic Subtidal and Intertidal Ecology		Fish, Shellfish and Sea Turtle Ecology		Marine Mammals		Offshore Ornithology	
																												Potential LSE Criteria	Progress to Stage 3/4?	Potential LSE Criteria	Progress to Stage 3/4?	Potential LSE Criteria	Progress to Stage 3/4?	Potential LSE Criteria	Progress to Stage 3/4?
SC_01	Arklow Phase 1 Power Cable	GE	Power	Operational	0.0	0.0	1	UK and Ireland															Yes	Yes	Yes	Yes	Yes	b	Yes	b	Yes	d	No	g	No
SC_02	HIBERNIA ATLANTIC SEG D	HIBERNIA ATLANTIC	Telecom	Operational	15.4	14.8	1	North Atlantic Ocean															Yes	Yes	Yes	Yes	Yes	c	Yes	b	Yes	d	No	g	No
SC_03	Codling Wind Park ECC	Fred. Olsen Seawind, EDF Energies	Power	Application submitted	18.9	18.0	**1**	UK and Ireland															Yes	Yes	Yes	Yes	Yes	c	Yes	c	Yes	d	No	g	No
SC_04	Dublin Array ECC	RWE	Power	Application submitted	31.9	31.0	**1**	UK and Ireland															Yes	Yes	Yes	Yes	Yes	c	Yes	c	Yes	d	No	g	No
SC_05	Mares Connect	Foresight Group's energy transition fund, Foresight Energy Infrastructure Partners and Etchea Energy	Power	Proposed	37.5	36.6	3	UK and Ireland															Yes	Yes	Yes	Yes	Yes	e	No	c	Yes	c	Yes	g	No
SC_06	UK-IRELAND 2 CROSSING	CENTURY LINK	Telecom	Operational	39.0	38.4	1	UK and Ireland															Yes	Yes	Yes	Yes	Yes	e	No	b	Yes	d	No	g	No
SC_07	ESAT 2	BT	Telecom	Operational	46.3	45.4	1	UK and Ireland															Yes	Yes	Yes	Yes	Yes	e	No	b	Yes	d	No	g	No
SC_08	SOBR1	Microsoft	Telecom	Proposed	48.9	48.0	3	Ireland/Wales															No	Yes	Yes	Yes	No	e	No	d	No	d	No	g	No
SC_09	CeltixConnect - Sea Fibre Networks	AQUACOMMS	Telecom	Operational	49.2	48.3	1	UK and Ireland															Yes	Yes	Yes	Yes	Yes	e	No	c	Yes	d	No	g	No
SC_10	HIBERNIA ATLANTIC SEG C	HIBERNIA ATLANTIC	Telecom	Operational	54.8	53.9	1	North Atlantic Ocean															Yes	Yes	Yes	Yes	Yes	e	No	b	Yes	d	No	g	No
SC_11	SOBR2	Microsoft	Telecom	Proposed	58.3	57.4	3	Ireland/Wales															No	Yes	Yes	Yes	No	e	No	d	No	d	No	g	No
SC_12	ZAYO Emerald Bridge One	ZAYO	Telecom	Operational	58.5	57.6	1	Ireland and United Kingdom															Yes	Yes	Yes	Yes	Yes	e	No	b	Yes	d	No	g	No
SC_13	BT-TE1	BT	Telecom	Decommissioned	58.6	57.7	3	UK															Yes	Yes	Yes	Yes	Yes	e	No	d	No	d	No	g	No
SC_14	SIRIUS SOUTH	Virgin Media	Telecom	Operational	58.7	57.8	1	UK and Ireland															Yes	Yes	Yes	Yes	Yes	e	No	b	Yes	d	No	g	No
SC_15	Rockabill Telecoms Cable	EUNETWORKS	Telecom	Operational	64.9	64.0	1	UK and Ireland															Yes	Yes	Yes	Yes	Yes	e	No	b	Yes	d	No	g	No
SC_16	UK-IRELAND CROSSING 1	CENTURY LINK	Telecom	Operational	67.0	66.4	1	UK and Ireland															Yes	Yes	Yes	Yes	Yes	e	No	b	Yes	d	No	g	No
SC_17	East West Interconnector	Eirgrid Interconnector Ltd	Power	Operational	68.5	67.6	1	UK and Ireland															Yes	Yes	Yes	Yes	Yes	e	No	b	Yes	d	No	g	No
SC_18	ESAT 1	BT	Telecom	Decommissioned	68.9	68.3	3	UK and Ireland															Yes	Yes	Yes	Yes	Yes	e	No	d	No	d	No	g	No
SC_19	CELTIC	BT	Telecom	Decommissioned	69.0	68.4	3	UK and Ireland															Yes	Yes	Yes	Yes	No	e	No	d	No	d	No	g	No
SC_20	SOLAS	VODAFONE	Telecom	Operational	69.0	68.4	1	UK and Ireland															Yes	Yes	Yes	Yes	Yes	e	No	b	Yes	d	No	g	No
SC_21	Tuskar	MICROSOFT	Telecom	Proposed	69.1	68.5	3	Ireland/Wales															No	Yes	Yes	Yes	No	e	No	d	No	d	No	g	No
SC_22	Havhingsten Telecoms Cable	AQUACOMMS	Telecom	Operational	70.3	69.3	1	Ireland - Denmark / UK															Yes	Yes	Yes	Yes	Yes	e	No	b	Yes	d	No	g	No
SC_23	Greenlink Interconnector	Eirgrid	Power	Operational	79.6	79.0	1	UK and Ireland															Yes	Yes	Yes	Yes	Yes	e	No	c	Yes	c	Yes	g	No
SC_24	NISA ECC	Statkraft	Power	Application submitted	80.0	79.1	**1**	UK and Ireland															Yes	Yes	Yes	Yes	Yes	e	No	c	Yes	d	No	g	No
SC_25	Oriel ECC	Oriel Windfarm Limited,Parkwind NV,ESB	Power	Application submitted	105.7	104.8	**1**	UK and Ireland															Yes	Yes	Yes	Yes	Yes	e	No	c	Yes	d	No	g	No
SC_26	Erebus/Valorous Potential Cable Route	Total / Simply Blue	Power	Proposed	123.7	123.0	3	UK															Yes	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
SC_27	Western HVDC Link	National Grid and Scottish Power	Power	Operational	124.9	123.9	1	North Atlantic Ocean															Yes	Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
SC_28	HIBERNIA ATLANTIC SEG A	Hibernia Atlantic	Telecom	Operational	126.9	125.9	1	North Atlantic Ocean															Yes	Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
SC_29	TATA ATLANTIC NORTH	TATA COMMUNICATIONS	Telecom	Operational	140.9	140.3	1	North Atlantic Ocean															Yes	Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
SC_30	GEMINI NORTH	VODAFONE	Telecom	Decommissioned	144.6	144.0	1	UK and Ireland															Yes	Yes	Yes	Yes	No	e	No	e	No	d	No	g	No
SC_31	Celtic Interconnector	RTE / EIRGRID	Power	Under construction	151.9	151.3	2	Ireland and France															Yes	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
SC_32	PTAT	CWC	Telecom	Decommissioned	153.5	152.9	1	North Atlantic Ocean															Yes	Yes	Yes	Yes	No	e	No	e	No	d	No	g	No
SC_33	Hibernia Express	HIBERNIA EXPRESS	Telecom	Operational	154.3	153.7	1	North Atlantic Ocean															Yes	Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
SC_34	MANX-N.IRELAND	BT	Telecom	Operational	154.7	153.9	1	Isle of Man and Northern Ireland															Yes	Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
SC_35	TGN W.EUROPE UK-PORTUGAL	TATA COMMUNICATIONS	Telecom	Operational	157.2	156.6	1	UK, Spain and Portugal															Yes	Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
SC_36	Rhyl Flats	Rhyl Flats Wind Farm Limited	Wind Export	Operational	157.7	156.8	1	Wales															No	Yes	Yes	Yes	Yes	e	No	g	No	g	No	g	No
SC_37	LANIS 1	Vodafone	Telecom	Operational	158.4	157.4	1	UK and Ireland															Yes	Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
SC_38	Gwynt y Mor	Gwynt-y-Môr OFTO plc	Wind Export	Operational	166.2	165.3	1	Wales															No	Yes	Yes	Yes	Yes	e	No	g	No	g	No	g	No
SC_39	North Hoyle	North Hoyle Wind Farm Limited	Wind Export	Operational	166.2	165.3	1	Wales															No	Yes	Yes	Yes	Yes	e	No	g	No	g	No	g	No
SC_40	LANIS 2	Vodafone	Telecom	Operational	166.3	165.3	1	UK and Ireland															Yes	Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
SC_41	IOM/UK INTERCONNECTOR	Manx Electricity Authority	Power	Operational	166.6	165.6	1	Isle of Man and UK															Yes	Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
SC_42	BURBO BANK EXTENSION INTER-ARRAY CABLE A01-A02	ORSTED	Power	Active	168.8	168.0	1	England															Yes	Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
SC_43	WESTERN LINK ARDNEILL TO WIRRAL 2 POWER CABLE	NATIONAL GRID AND SCOTTISH POWER	Power	Active	170.3	169.4	1	Scotland/England															Yes	Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
SC_44	BT-MT1	BT	Telecom	Operational	171.2	170.2	1	UK															Yes	Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
SC_45	TAT 11	VODAFONE	Telecom	Decommissioned	174.3	173.6	1	North Atlantic Ocean															Yes	Yes	Yes	Yes	No	e	No	e	No	d	No	g	No
SC_46	SWANSEA/BREAN	VODAFONE	Telecom	Operational	175.2	174.5	1	Wales															Yes	Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
SC_47	APOLLO NORTH	VODAFONE	Telecom	Operational	186.0	185.5	1	North Atlantic Ocean															Yes	Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
SC_48	WALNEY 3 EXPORT CABLE	ORSTED	Power	Active	187.3	186.3	1	England															Yes	Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
SC_49	WALNEY 4 EXPORT CABLE	ORSTED	Power	Active	191.4	190.4	1	England															Yes	Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
SC_50	Burbo Bank Export Cable 1	Ørsted Burbo (UK) Limited	Wind Export	Operational	191.7	190.9	1	Wales															No	Yes	Yes	Yes	Yes	e	No	g	No	g	No	g	No
SC_51	SCOTLAND-N.IRELAND 1	BT	Telecom	Operational	191.7	190.8	1	Scotland/Northern Ireland															Yes	Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
SC_52	Xlinks	XLinks	Power	On hold	192.3	191.6	2	Morocco/UK															Yes	Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
SC_53	TATA ATLANTIC SOUTH	TATA COMMUNICATIONS	Telecom	Operational	193.8	193.1	1	North Atlantic Ocean															Yes	Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
SC_54	SIRIUS NORTH	Virgin Media	Telecom	Operational	195.9	195.0	1	UK and Ireland															Yes	Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No

SC_55	GRACE HOPPER TELECOM CABLE	GOOGLE	Telecom	Active	201.3	200.7	1	Ireland/England														No	Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
SC_56	Walney 2 OFTO	Blue Transmission Walney 2 OFTO Limited	Wind Export	Operational	202.8	201.8	1	England														No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
SC_57	Walney 1 OFTO	Blue Transmission Walney 2 OFTO Limited	Wind Export	Operational	203.9	202.9	1	England														No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
SC_58	LANIS 3	Vodafone	Telecom	Operational	204.6	203.7	1	UK and Ireland														Yes	Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
SC_59	West of Duddon Sands OFTO	WoDS Transmission Plc	Wind Export	Operational	204.6	203.6	1	England														No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
SC_60	LirlC		Power	Proposed	204.6	203.7	3	UK and Ireland														Yes	Yes	Yes	Yes	Yes	e	No	e	No	c	Yes	g	No
SC_61	YELLOW	CENTURY LINK	Telecom	Operational	207.2	206.6	1	North Atlantic Ocean														Yes	Yes	Yes	Yes	Yes	e	No	e	No	d	No		No
SC_62	Ormonde OFTO	TC Ormonde OFTO Limited	Wind Export	Operational	209.5	208.5	1	England														No	Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
SC_63	IRIS SEG 1 TELECOM CABLE	FARICE	Telecom	Active	210.1	200.7	1	Iceland/Ireland														No	No	Yes	Yes	Yes	e	No	e	No	d	No	g	No
SC_64	Barrow OFTO	TC Barrow OFTO Limited	Wind Export	Operational	211.5	210.5	1	England														No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
SC_65	MOYLE INTERCONNECTOR SOUTH	Moyle Interconnector Ltd	Power	Operational	214.8	213.9	1	Scotland/Northern Ireland														Yes	Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
SC_66	MOYLE INTERCONNECTOR NORTH	Moyle Interconnector Ltd	Power	Operational	215.0	214.1	1	Scotland/Northern Ireland														Yes	Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
SC_67	TAT14	BT	Telecom	Decommissioned	216.1	215.5	1	North Atlantic Ocean														Yes	Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
SC_68	SCOTLAND-N IRELAND 3 TELECOM CABLE	BT	Telecom	Active	218.6	217.7	1	Scotland/Nothern Ireland														Yes	Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
SC_69	SCOTLAND-NI 2	BT	Telecom	Operational	218.2	217.3	1	Scotland/Northern Ireland														Yes	Yes	Yes	Yes	Yes	e	No	e	No	d	No	g	No
SC_70	Amitie		Telecom	Operational	221.0	220.4	1	France/UK/US														No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
SC_71	TAT 8	BT	Telecom	Decommissioned	221.8	221.1	1	North Atlantic Ocean														No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
SC_72	GLO 1	GLOBACOM LTD	Telecom	Operational	222.7	222.0	1	UK/Nigeria														No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
SC_73	EUROPE INDIA GATEWAY	VODAFONE	Telecom	Operational	223.8	223.1	1	Europe/Middle East														No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
SC_74	Robin Rigg OFTO	TC Robin Rigg OFTO Limited	Wind Export	Operational	250	249	1	Scotland														No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
SC_75	AE Connect Cable	AQUACOMMS	Telecom	Operational	259.7	256.0	1	North Atlantic Ocean														No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
SC_76	Wave Hub	Wave Hub Limited	Wind Export	Operational	259.8	259.2	1	England														No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
SC_77	Havfrue	Aqua Comms	Telecom	Operational	273.5	266.3	1	North Atlantic Ocean														No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
SC_78	FLAG ATLANTIC NORTH	RELIANCE GLOBALCOM	Telecom	Operational	276.9	276.3	1	North Atlantic Ocean														No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
SC_79	TAT 14	BT	Telecom	Decommissioned	277.8	277.2	3	North Atlantic Ocean														No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
SC_80	TAT 12	BT	Telecom	Decommissioned	279.3	278.7	3	North Atlantic Ocean														No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
SC_81	Isle of Scilly	Western Power Distribution	Power	Operational	287.3	286.7	1	England														No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
SC_82	ATLANTIC CROSSING 1 SEG B1 and C	CENTURY LINK	Telecom	Operational	288.5	287.9	1	North Atlantic Ocean														No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
SC_83	FABLin	Unknown	Power	Proposed	292.4	291.7	3	England - France														No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
SC_84	FLAG ATLANTIC INTERLINK	GLOBAL CLOUD XCHANGE	Telecom	Operational	293.4	292.8	1	North Atlantic Ocean														No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
SC_85	TAT12-13	BT	Telecom	Operational	293.4	292.8	1	North Atlantic Ocean														No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
SC_86	RIOJA 1	BT	Telecom	Decommissioned	293.4	292.8	1	UK														No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
SC_87	RIOJA 2	BT	Telecom	Decommissioned	293.4	292.8	1	UK														No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
SC_88	HUGO	VODAFONE	Telecom	Operational	293.4	292.8	1	UK and Ireland														No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
SC_89	BT IOS1	BT	Telecom	Operational	293.5	292.9	1	UK														No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
SC_90	SEA-ME WE 3	BT	Telecom	Decommissioned	301.9	301.3	1	Europe/Asia														No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
SC_91	SEA-ME-WE3	BT	Telecom	Operational	302.0	301.4	1	Europe/Asia														No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
SC_92	UK-SPAIN 4	BT	Telecom	Decommissioned	302.9	302.3	1	UK/Spain														No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
SC_93	UK/CH.ISLANDS 7	BT / GUERNSEY TELECOMS	Telecom	Operational	308.7	308.0	1	UK/Channel Islands														No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
SC_94	LIBERTY	JERSEY TELECOMS	Telecom	Operational	309.1	308.4	1	UK/Channel Islands														No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
SC_95	GEMINI SOUTH	VODAFONE	Telecom	Decommissioned	311.3	310.7	1	UK and Ireland														No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
SC_96	TAT 9	BT	Telecom	Decommissioned	318.2	317.5	1	North Atlantic Ocean														No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
SC_97	APOLLO SOUTH	VODAFONE	Telecom	Operational	399.3	398.7	1	North Atlantic Ocean														No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
SC_98	FLAG ATLANTIC SOUTH	GLOBAL CLOUD XCHANGE	Telecom	Operational	410.0	409.4	1	North Atlantic Ocean														No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
SC_99	Guernsey-France (GF1)	Guernsey Electricity	Power	Proposed	427.5	426.8	3	Channel Islands - France														No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
SC_100	GUERNSEY-JERSEY 1 OVERLAY 90KV INTERCONNECTOR CABLE	CIEG	Power	Operational	431.6	430.9	1	Channel Islands														No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
SC_101	GUERNSEY-JERSEY 1 90KV INTERCONNECTOR CABLE	CIEG	Power	Decommissioned	431.7	431.0	1	Channel Islands														No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
SC_102	INGRID GJ TELCOM CABLE	CIEG	Telecom	Operational	432.0	431.3	1	Channel Islands														No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
SC_103	GUERNSEY-JERSEY 4 TELECOM CABLE	C&W GUERNSEY	Telecom	Operational	433.4	432.6	1	Channel Islands														No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
SC_104	NORMANDIE 1 90KV INTERCONNECTOR CABLE	CIEG	Power	Operational	474.1	473.4	1	Channel Islands														No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
SC_105	INGRID JF TELCOM CABLE	CIEG	Telecom	Operational	474.1	473.4	1	Channel Islands														No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
SC_106	NORMANDIE 2 90KV INTERCONNECTOR CABLE	CIEG	Power	Operational	474.1	473.4	1	Channel Islands														No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
SC_107	NORMANDIE 3 90KV INTERCONNECTOR CABLE	CIEG	Power	Operational	475.6	474.9	1	Channel Islands														No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
SC_108	SAINT-BRIEUC SEG 02 POWER CABLE	RTE	Power	Operational	489.4	488.7	1	France														No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
SC_109	SAINT-BRIEUC SEG 01 POWER CABLE	RTE	Power	Operational	489.4	488.7	1	France														No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
SC_110	TAT 14(K)	Telia Carrier	Telecom	Decommissioned	565.2	562.0	1	North Atlantic Ocean														No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No

SC_111	IceLink (Interco Iceland-UK)	Unknown	Power	Proposed	629.6	628.7	3	Iceland - Scotland																No	Yes	Yes	Yes	Yes	e	No	g	No	g	No	g	No
SC_112	Atlantic Super Connection	Unknown	Power	Proposed	635.9	635.0	3	Iceland - Ireland																No	Yes	Yes	Yes	Yes	e	No	g	No	g	No	g	No
SC_113	ATLANTIC CROSSING 1 SEG A	Century Link	Telecom	Operational	772.1	771.2	1	North Atlantic Ocean																No	Yes	Yes	Yes	Yes	e	No	g	No	g	No	g	No
SC_114	TAT 10B WEST SECTION	Deutsche Telekom AG	Telecom	Decommissioned	783.7	782.8	1	Scotland																No	Yes	Yes	Yes	Yes	e	No	g	No	g	No	g	No
SC_115	Quad 204 FPSO (Power from Shore)	Unknown	Power	Proposed	836.1	835.2	3	Scotland																No	Yes	Yes	Yes	Yes	e	No	g	No	g	No	g	No

Offshore Cumulative Effects Assessment Matrix - Aquaculture - Celtic Sea Region

Other Development Details									Phases of Other Developments in relation to the construction phase of the Proposed Development (denoted in red)														Stage 1				Stage 2							
ID	Site ID	Licence Holder	County	Product	Distance to the Proposed Development Array Area (km)	Distance to the Proposed Development Cable Corridor and Working Area (km)	Tier	Region	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	ICES Celtic Sea 7a	ICES Celtic Sea	Within ZoI for at least one topic?	Progress to Stage 2?	Overlap in temporal scope?	Benthic Subtidal and Intertidal Ecology		Fish, Shellfish and Sea Turtle Ecology		Marine Mammals		Offshore Ornithology	
																												Potential LSE Criteria	Progress to Stage 3/4?	Potential LSE Criteria	Progress to Stage 3/4?	Potential LSE Criteria	Progress to Stage 3/4?	Potential LSE Criteria	Progress to Stage 3/4?
AQC_01	T32-027A	Irish Mussel Seed Company Ltd	Wicklow	Shellfish	9.9	5.3	1	Ireland															Yes	Yes	Yes	Yes	Yes	c	Yes	g	No	e	No	g	No
AQC_02	T03-035C	Wexford Mussels Ltd	Wexford	Shellfish	45.0	44.4	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_03	T03-055F&C	Crescent Seafoods Ltd	Wexford	Shellfish	45.1	44.5	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_04	T03-052A	WD Shellfish Ltd	Wexford	Shellfish	45.2	44.6	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_05	T03-049B	River Bank Mussels Ltd	Wexford	Shellfish	45.6	45.0	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_06	T03-046B	Fjord Fresh Mussels Ltd	Wexford	Shellfish	45.8	45.2	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_07	T03-030F	T.L. Mussels Ltd	Wexford	Shellfish	45.8	45.3	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_08	T03-035F&G	Wexford Mussels Ltd.	Wexford	Shellfish	45.9	45.3	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_09	T03-046A	Fjord Fresh Mussels Ltd	Wexford	Shellfish	46.0	45.5	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_10	T03-030E	T.L. Mussels Ltd	Wexford	Shellfish	46.2	45.6	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_11	T03-071A	River Bank Mussels Ltd	Wexford	Shellfish	46.2	45.6	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_12	T03-048A	Noel & Sheila Scallan	Wexford	Shellfish	46.3	45.7	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_13	T03-052B	WD Shellfish Ltd	Wexford	Shellfish	46.7	46.1	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_14	T03-035A	Wexford Mussels Ltd	Wexford	Shellfish	46.7	46.1	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_15	T03-035B	Wexford Mussels Ltd	Wexford	Shellfish	47.2	46.6	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_16	T03-047C	Loch Garman Harbour Mussels Ltd	Wexford	Shellfish	47.4	46.9	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_17	T03-055E	Crescent Seafoods Ltd	Wexford	Shellfish	47.6	47.1	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_18	T03-030B	T.L. Mussels Ltd	Wexford	Shellfish	47.6	47.1	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_19	T03-049A	River Bank Mussels Ltd	Wexford	Shellfish	47.7	47.1	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_20	T03-049D	River Bank Mussels Ltd	Wexford	Shellfish	47.8	47.2	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_21	T03-030D	T.L. Mussels Ltd	Wexford	Shellfish	48.3	47.7	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_22	T03-030A2	T.L. Mussels Ltd	Wexford	Shellfish	48.3	47.8	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_23	T03-046C	Fjord Fresh Mussels Ltd	Wexford	Shellfish	48.6	48.0	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_24	T03-047A	Loch Garman Harbour Mussels Ltd	Wexford	Shellfish	48.6	48.0	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_25	T03-049C	River Bank Mussels Ltd	Wexford	Shellfish	48.9	48.3	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_26	T03-092A	Patrick Cullen	Wexford	Shellfish	49.2	48.6	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_27	T03-047B	Loch Garman Harbour Mussels Ltd	Wexford	Shellfish	49.5	48.9	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_28	T03-030C	T.L. Mussels Ltd	Wexford	Shellfish	49.6	49.1	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_29	T03-079A	Paddy Cullen	Wexford	Shellfish	49.7	49.1	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_30	T03-049C1	River Bank Mussels Ltd	Wexford	Shellfish	50.0	49.4	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_33	T03-032B	Special Bannow Bay Shellfish Ltd	Wexford	Shellfish	72.1	71.5	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_34	T03-032-1	Special Bannow Bay Shellfish Ltd	Wexford	Shellfish	72.3	71.7	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_35	T03-041-1A	Eugene Fitzpatrick	Wexford	Shellfish	72.3	71.7	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_36	T03-041B	Eugene Fitzpatrick	Wexford	Shellfish	72.4	71.8	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_37	T03-041-1B	Eugene Fitzpatrick	Wexford	Shellfish	72.5	71.9	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_38	T03-031B	Bannow Island Shellfish Ltd	Wexford	Shellfish	72.5	71.9	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_39	T03-032A	Special Bannow Bay Shellfish Ltd	Wexford	Shellfish	72.5	71.9	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_40	T03-031A	Bannow Island Shellfish Ltd	Wexford	Shellfish	72.5	71.9	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_41	T03-031-1	Sean Ffrench, Bannow Island Shellfish Ltd	Wexford	Shellfish	72.5	71.9	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_42	T03-025-1	Hookhead Shellfish Ltd	Wexford	Shellfish	72.7	72.2	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_43	T03-041A	Eugene Fitzpatrick	Wexford	Shellfish	72.9	72.3	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_44	T03-025B	Hookhead Shellfish Ltd	Wexford	Shellfish	73.2	72.6	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_45	T03-025A	Hookhead Shellfish Ltd	Wexford	Shellfish	73.7	73.1	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_46	T04-037D	South East Shellfish Co-Op Ltd	Waterford	Shellfish	81.0	80.5	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_47	T04-151A	Oceanus Fishing Ltd	Waterford	Shellfish	81.2	80.6	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_48	T04-037A	South East Shellfish Co-Op Ltd	Waterford	Shellfish	81.2	80.7	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_49	T04-123A	Woodstown Bay Shellfish Ltd	Waterford	Shellfish	81.6	81.0	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_50	T04-123B	Woodstown Bay Shellfish Ltd	Waterford	Shellfish	82.3	81.7	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_51	T04-152A	Oceanus Fishing Ltd	Waterford	Shellfish	82.8	82.3	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_52	T04-140	S.B.S. Ltd	Waterford	Shellfish	83.7	83.1	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_53	T04-139	Patrick Dwyer	Waterford	Shellfish	83.9	83.3	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_54	T04-134	William Joseph Dwyer	Waterford	Shellfish	84.0	83.4	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_55	T04-136	Bells Isle Seafood Ltd and PKD Oysters Ltd	Waterford	Shellfish	84.2	83.7	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_56	T04-137	Patrick Moran	Waterford	Shellfish	84.3	83.8	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_57	T04-135	Philip Walsh	Waterford	Shellfish	84.4	83.8	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_58	T04-133	Paul Bennett	Waterford	Shellfish	84.5	83.9	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_59	T04-138	Patrick Moran & Anthony Fortune	Waterford	Shellfish	84.6	84.0	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_60	T04-044	Woodstown Bay Shellfish Ltd	Waterford	Shellfish	84.8	84.2	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_61	T04-131	Woodstown Bay Shellfish Ltd	Waterford	Shellfish	84.9	84.3	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_62	T04-037E	South East Shellfish Co-Op Ltd	Waterford	Shellfish	85.3	84.7	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_63	T04-044-1	Woodstown Bay Shellfish Ltd	Waterford	Shellfish	85.3	84.7	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_64	T04-156A	Irish Seed Mussel Company Ltd	Waterford	Shellfish	85.8	85.2	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_65	T04-155A	Irish Seed Mussel Company Ltd	Waterford	Shellfish	86.2	85.6	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_66	T04-154A	Irish Seed Mussel Company Ltd	Waterford	Shellfish	86.6	86.0	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_67	T04-153A	Irish Seed Mussel Company Ltd	Waterford	Shellfish	87.1	86.5	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_68	T01-101A	Ciarán Traynor	Louth	Shellfish	121.9	121.0	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_69	T01-100A	Keenan Oysters Ltd	Louth	Shellfish	122.5	121.6	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_70	T01-025C	Carlingford Oyster Company Ltd	Louth	Shellfish	122.5	121.6	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_71	T01-102A	Gary Lamph & Charm Louet-Feisser	Louth	Shellfish	122.7	121.8	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_72	T01-018A	Cooley Oysters Ltd	Louth	Shellfish	123.0	122.1	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_74	T01-021	Cooley Oysters Ltd	Louth	Shellfish	123.5	122.6	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_76	T01-121A	Cooley Oysters Ltd	Louth	Shellfish	123.7	122.8	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_77	T01-018B	Cooley Oysters Ltd	Louth	Shellfish	124.0	123.1	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_79	T01-118A	Keenan Oysters Ltd	Louth	Shellfish	124.4	123.5	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_80	T01-026A	Keenan Oysters Ltd	Louth	Shellfish	124.6	123.7	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_81	T01-089A	Keenan Oysters Ltd	Louth	Shellfish	124.7	123.7	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No

AQC_82	T01-117A	Keenan Oysters Ltd	Louth	Shellfish	124.7	123.8	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_83	T01-044A	Carlingford Oyster Company Ltd	Louth	Shellfish	124.8	123.9	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_84	T01-043A	Kian Louet-Feisser	Louth	Shellfish	124.9	124.0	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_85	T01-020	Cooley Oysters Ltd	Louth	Shellfish	125.0	124.0	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_86	T01-025A	Carlingford Oyster Company Ltd	Louth	Shellfish	125.0	124.1	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_87	T01-019	Cooley Oysters Ltd	Louth	Shellfish	125.0	124.1	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_88	T01-043C	Charm Louet-Feisser	Louth	Shellfish	125.1	124.2	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_89	T01-024	Keenan Oysters Ltd	Louth	Shellfish	125.3	124.4	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_90	T01-120A	Conan Lamph	Louth	Shellfish	125.3	124.4	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_91	T01-043B	Charm Louet-Feisser	Louth	Shellfish	125.4	124.5	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_92	T01-060A1	Hugh McCrum	Louth	Shellfish	125.4	124.5	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_93	T01-044B	Carlingford Oyster Company Ltd	Louth	Shellfish	125.6	124.7	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_94	T01-008A	Carlingford Oyster Company Ltd	Louth	Shellfish	125.7	124.8	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_95	T01-023A	Keenan Oysters Ltd	Louth	Shellfish	126.0	125.1	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_96	T01-004	Keenan Oysters Ltd	Louth	Shellfish	126.2	125.3	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_97	T01-009	Cooley Oysters Ltd	Louth	Shellfish	126.3	125.4	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_98	T01-071A	HolLand Based Shellfish International BV	Louth	Shellfish	126.4	125.5	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_99	T01-012	Cooley Oysters Ltd	Louth	Shellfish	126.4	125.5	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_100	T01-072B1	Fresco Seafoods Ltd	Louth	Shellfish	126.5	125.6	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_101	T04-020-1	Green Oysters Ltd	Waterford	Shellfish	126.8	126.2	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_102	T04-023B	PKA Ltd	Waterford	Shellfish	126.8	126.2	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_103	T01-050A1	Carlingford Lough Shellfish Co-op Society ltd	Louth	Shellfish	126.8	125.9	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_104	T04-004A	Iasc Sliogach Dún Garbhán Teoranta	Waterford	Shellfish	126.8	126.3	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_105	T04-017B	Bia Mara (Deise) Teo	Waterford	Shellfish	126.9	126.4	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_106	T04-066	Odhrán MacMurchadha	Waterford	Shellfish	127.2	126.6	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_107	T04-017A	Bia Mara (Deise) Teo	Waterford	Shellfish	127.2	126.6	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_108	T04-021	David J Cullinan	Waterford	Shellfish	127.2	126.7	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_109	T04-057	Green Oysters Ltd	Waterford	Shellfish	127.2	126.7	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_110	T04-141A	Green Oysters Ltd	Waterford	Shellfish	127.2	126.7	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_111	T04-059A	Green Oysters Ltd	Waterford	Shellfish	127.2	126.7	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_112	T04-004B	Iasc Sliogach Dún Garbhán Teoranta	Waterford	Shellfish	127.3	126.7	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_113	T04-023A	PKA Ltd	Waterford	Shellfish	127.4	126.8	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_114	T04-038	Bia Mara (Deise) Teo	Waterford	Shellfish	127.5	126.9	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_115	T04-147A	PKA Ltd	Waterford	Shellfish	127.5	126.9	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_116	T04-014A	James Harty	Waterford	Shellfish	127.5	126.9	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_117	T01-105A	Down Mussels Ltd	Louth	Shellfish	127.5	126.6	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_118	T04-018B	Patrick Cullen	Waterford	Shellfish	127.5	127.0	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_119	T04-032	Tom Barron	Waterford	Shellfish	127.6	127.0	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_120	T04-129A	Bia Mara (Deise) Teo	Waterford	Aquatic Plant, Shellfish	127.6	127.1	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_121	T04-011A	PKA Ltd	Waterford	Shellfish	127.7	127.1	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_122	T04-020A	Criostóir O'Cionnfhaolaidh	Waterford	Shellfish	127.7	127.2	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_123	T04-146	PKA Ltd	Waterford	Shellfish	127.7	127.2	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_124	T04-143A	Mark Steele	Waterford	Shellfish	127.7	127.2	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_125	T04-049	Bia Mara (Deise) Teo	Waterford	Shellfish	127.7	127.2	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_126	T04-014-1A	James Harty	Waterford	Shellfish	127.7	127.2	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_127	T04-017F	Bia Mara (Deise) Teo	Waterford	Shellfish	127.8	127.2	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_128	T04-053A	Seamus Hayes	Waterford	Shellfish	127.8	127.2	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_129	T04-129B	Bia Mara (Deise) Teo	Waterford	Aquatic Plant, Shellfish	127.8	127.2	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_130	T04-054B	PRODUCTION CHIRON ATD LTD.	Waterford	Shellfish	127.8	127.2	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_131	T04-033	Bia Mara (Deise) Teo	Waterford	Shellfish	127.8	127.3	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_132	T04-032-1	Tom Barron	Waterford	Shellfish	127.8	127.3	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_133	T04-065A	Tadhg O'Maoileoin	Waterford	Shellfish	127.9	127.3	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_134	T04-060A	Tadhg O'Maoileoin Teo	Waterford	Shellfish	127.9	127.3	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_135	T04-048A	APA Shellfish Farming Ltd	Waterford	Shellfish	127.9	127.3	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_136	T04-047A	Tadhg O'Maoileoin	Waterford	Shellfish	127.9	127.3	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_137	T04-058A	APA Shellfish Farming Ltd	Waterford	Shellfish	127.9	127.3	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_138	T04-064	Tadhg O'Maoileoin	Waterford	Shellfish	127.9	127.3	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_139	T04-060C	Tadhg O'Maoileoin	Waterford	Shellfish	127.9	127.3	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_140	T04-060B	Tadhg O'Maoileoin	Waterford	Shellfish	127.9	127.3	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_141	T04-017D	Bia Mara (Deise) Teo	Waterford	Shellfish	127.9	127.3	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_142	T04-017C	Bia Mara (Deise) Teo	Waterford	Shellfish	127.9	127.4	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_143	T04-018C	PKA Ltd	Waterford	Shellfish	127.9	127.4	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_144	T04-017E	Bia Mara (Deise) Teo	Waterford	Shellfish	127.9	127.4	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_145	T04-055A	Bia Mara (Deise) Teo	Waterford	Shellfish	127.9	127.4	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_146	T04-127A	PKA Ltd	Waterford	Shellfish	128.0	127.5	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_147	T04-126B2	Tadhg O'Maoileoin Teo	Waterford	Shellfish	128.1	127.5	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_148	T04-126C	Tadhg O'Maoileoin Teo	Waterford	Shellfish	128.1	127.5	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_149	T04-126A	Tadhg O'Maoileoin Teo	Waterford	Shellfish	128.1	127.5	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_150	T04-126B1	Tadhg O'Maoileoin Teo	Waterford	Shellfish	128.1	127.5	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_151	T04-129D	Bia Mara (Deise) Teo	Waterford	Aquatic Plant, Shellfish	128.1	127.6	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_152	T04-150A	James Harty	Waterford	Shellfish	128.1	127.6	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_153	T04-125A	PKA Ltd	Waterford	Shellfish	128.1	127.6	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_154	T04-054-1	PRODUCTION CHIRON ATD LTD.	Waterford	Shellfish	128.1	127.6	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_155	T04-054A	PRODUCTION CHIRON ATD LTD.	Waterford	Shellfish	128.3	127.8	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_156	T01-103A	A. McCarthy Mussels Ltd	Louth	Shellfish	128.4	127.5	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_157	T04-129C	Bia Mara (Deise) Teo	Waterford	Aquatic Plant, Shellfish	128.4	127.8	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_158	T04-142A	Bia Mara (Deise) Teo	Waterford	Shellfish	128.4	127.8	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_159	T01-050C	Carlingford Lough Shellfish Co-op Society Ltd	Louth	Shellfish	129.4	128.5	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_160	T01-029B	Liam O'Connor	Louth	Shellfish	129.4	128.5	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_161	T01-066A	Emerald Mussels Ltd	Louth	Shellfish	130.1	129.2	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_162	T01-061A1	Ciaran Morgan	Louth	Shellfish	130.4	129.5	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_163	T01-070A1	HOLLAND SHELLFISH IRELAND	Louth	Shellfish	130.5	129.6	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_164	T01-074A2	Emerald Mussels Ltd	Louth	Shellfish	130.5	129.6	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_165	T01-090A	Fresco Seafoods Ltd	Louth	Shellfish	132.1	131.2	1	Ireland													Yes	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No

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AQC_257	T11-076C	Atlantic Clams Ireland Ltd	Sligo	Shellfish	235.2	233.5	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_258	T06-331A	Ballylongford Shellfish Producers Group	Kerry	Shellfish	236.5	229.5	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_259	T06-331-A	Ballylongford Shellfish Producers Group	Kerry	Shellfish	236.5	229.5	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_260	T12-009	Donegal Shellfish Ltd	Donegal	Shellfish	237.9	237.1	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_261	T12-463A	Paul McHugh	Donegal	Shellfish	238.0	237.2	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_262	T12-350A	Paul & George McHugh	Donegal	Shellfish	238.0	237.2	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_263	T12-465A	Paul McHugh	Donegal	Shellfish	238.2	237.3	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_264	T12-350B	Paul & George McHugh	Donegal	Shellfish	238.3	237.5	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_265	T06-370A	Peter Tighe	Kerry	Shellfish	238.4	231.4	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_266	T12-374A	Seabreeze Ltd	Donegal	Shellfish	238.5	237.7	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_267	T12-463B	Paul McHugh	Donegal	Shellfish	238.5	237.7	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_268	T12-092C	Seabreeze Ltd	Donegal	Shellfish	238.6	237.8	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_269	T12-092B	Seabreeze Ltd	Donegal	Shellfish	238.8	237.9	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_270	T12-467D	Seabreeze Ltd	Donegal	Shellfish	238.8	238.0	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_271	T12-402D	Seabreeze Ltd	Donegal	Shellfish	238.8	238.0	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_272	T12-467C	Seabreeze Ltd	Donegal	Shellfish	239.4	238.6	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_273	T12-402B	Seabreeze Ltd	Donegal	Shellfish	239.4	238.6	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_274	T12-092A	Seabreeze Ltd	Donegal	Shellfish	239.5	238.7	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_275	T06-347C	Peter Tighe	Kerry	Shellfish	239.5	232.6	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_276	T12-467B	Seabreeze Ltd	Donegal	Shellfish	239.7	238.9	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_277	T12-401C	Eugene Doherty, Conor Reid & Greg McGroary	Donegal	Shellfish	239.8	239.0	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_278	T06-347B	Peter Tighe	Kerry	Shellfish	239.9	232.9	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_279	T12-347A	Racoo Shellfish Ltd & Bells Isle Seafood Ltd	Donegal	Shellfish	240.1	239.3	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_280	T12-467A	Seabreeze Ltd	Donegal	Shellfish	240.1	239.3	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_281	T08-095C	Michael McMahon	Clare	Shellfish	240.1	232.6	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_282	T08-008OFO	Mr & Mrs Glen Driver	Clare	Shellfish	240.2	232.6	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_283	T12-401B	Eugene Doherty, Conor Reid & Greg McGroary	Donegal	Shellfish	240.2	239.4	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_284	T08-101B	Aiden F Casey	Clare	Shellfish	240.2	232.8	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_285	T08-095B	Michael McMahon	Clare	Shellfish	240.2	232.7	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_286	T08-097B	Poulnasherry Oysters Ltd	Clare	Shellfish	240.2	232.8	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_287	T08-096B	Moyasta Oysters Ltd	Clare	Shellfish	240.2	232.8	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_288	T08-099B	Mairead Mahoney	Clare	Shellfish	240.3	232.8	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_289	T08-097A	Poulnasherry Oysters Ltd	Clare	Shellfish	240.3	232.8	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_290	T08-099A	Mairead Mahoney	Clare	Shellfish	240.3	232.8	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_291	T08-096A	Moyasta Oysters Ltd	Clare	Shellfish	240.3	232.9	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_292	T08-101A	Aiden F Casey	Clare	Shellfish	240.4	232.9	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_293	T12-402C	Seabreeze Ltd	Donegal	Shellfish	240.4	239.5	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_294	T08-102B	Michael Egan	Clare	Shellfish	240.4	232.8	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_295	T08-095A	Michael McMahon	Clare	Shellfish	240.4	232.8	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_296	T12-401A	Eugene Doherty, Conor Reid & Greg McGroary	Donegal	Shellfish	240.4	239.6	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_297	T08-095D	Michael McMahon	Clare	Shellfish	240.4	232.8	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_298	T08-102A	Michael Egan	Clare	Shellfish	240.5	232.9	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_299	T06-347A	Peter Tighe	Kerry	Shellfish	240.5	233.6	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_300	T08-094B	THOMAS BLUNNIE	Clare	Shellfish	240.5	233.0	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_301	T08-086A	Thomas Blunnie	Clare	Shellfish	240.6	233.0	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_302	T08-097C	Poulnasherry Oysters Ltd	Clare	Shellfish	240.7	233.1	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_303	T08-098A	Brendan Garvey	Clare	Shellfish	240.7	233.1	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_304	T12-346A	Donegal Oysters Ltd	Donegal	Shellfish	240.7	239.9	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_305	T08-096C-E	Moyasta Oysters Ltd	Clare	Shellfish	240.7	233.2	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_306	T08-097E	Poulnasherry Oysters Ltd	Clare	Shellfish	240.8	233.1	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_307	T08-098B	Brendan Garvey	Clare	Shellfish	240.8	233.2	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_308	T08-097D	Poulnasherry Oysters Ltd	Clare	Shellfish	240.8	233.2	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_309	T12-243D	Donegal Oysters Ltd	Donegal	Shellfish	240.9	240.0	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_310	T08-096D	Moyasta Oysters Ltd	Clare	Shellfish	240.9	233.3	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_311	T08-096E	Moyasta Oysters Ltd	Clare	Shellfish	240.9	233.3	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_312	T08-098C	Brendan Garvey	Clare	Shellfish	240.9	233.3	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_313	T08-096F	Moyasta Oysters Ltd	Clare	Shellfish	240.9	233.3	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_314	T08-096C-W	Moyasta Oysters Ltd	Clare	Shellfish	240.9	233.3	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_315	T12-243C	Donegal Oysters Ltd	Donegal	Shellfish	240.9	240.1	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_316	T08-099C	Mairead Mahoney	Clare	Shellfish	240.9	233.3	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_317	T12-349A	Donegal Oceandeep Oysters Ltd	Donegal	Shellfish	241.0	240.2	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_318	T12-145B	Donegal Oceandeep Oysters Ltd	Donegal	Shellfish	241.1	240.2	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_319	T08-106A	Moyasta Oysters Ltd	Clare	Shellfish	241.1	233.5	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_320	T08-108A	Brendan Garvey	Clare	Shellfish	241.2	233.6	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_321	T05-011A	Brendan Kingston	Cork	Shellfish	241.2	240.6	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_322	T12-243A	Donegal Oysters Ltd	Donegal	Shellfish	241.3	240.5	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_323	T12-243B	Donegal Oysters Ltd	Donegal	Shellfish	241.3	240.5	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_324	T12-446A	Donegal Aquaculture Services Ltd	Donegal	Shellfish	241.4	240.5	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_325	T12-371A	Enda Travers	Donegal	Shellfish	241.4	240.6	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_326	T12-145A	Donegal Oceandeep Oysters Ltd	Donegal	Shellfish	241.5	240.7	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_327	T12-396	Donegal Oceandeep Oysters Ltd & Donegal Oysters Ltd	Donegal	Shellfish	241.6	240.8	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_328	T12-443A	Rory McHugh	Donegal	Shellfish	242.6	241.8	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_329	T12-428A	Kieran, Michael, Paul & Thomas McHugh	Donegal	Echinoderm	243.5	242.7	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_331	T12-063A	Comhlucht Iascaireachta Fanad Teoranta	Donegal	Finfish	245.4	244.6	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_332	T12-063B	Comhlucht Iascaireachta Fanad Teoranta	Donegal	Finfish	245.5	244.7	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_333	T12-276A	Ocean Farm Ltd	Donegal	Finfish	246.3	245.5	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_334	T12-535A	Damien Kennedy	Donegal	Aquatic Plant, Echinoderm, Shellfish	246.3	245.5	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_335	T12-276B	Ocean Farm Ltd	Donegal	Finfish	246.4	245.6	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_336	T12-538A	Gary Kennedy	Donegal	Aquatic Plant, Echinoderm, Shellfish	246.4	245.6	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_337	T12-96	Comhlucht Iascaireacht Fanad Teoranta	Donegal	Finfish	246.4	245.6	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_338	T12-096A	Comhlucht Iascaireachta Fanad Teoranta	Donegal	Finfish	246.4	245.6	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_339	T09-078-1	Udaras na Gaeltachta	Galway	Shellfish	246.5	237.0	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_340	T12-096B	Comhlucht Iascaireachta Fanad Teoranta	Donegal	Finfish	246.5	245.7	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_341	T12-381D	Ocean Farm Ltd	Donegal	Shellfish	246.8	246.0	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_342	T12-381C	Ocean Farm Ltd	Donegal	Shellfish	246.9	246.2	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No

AQC_343	T12-318B	Ocean Farm Ltd	Donegal	Finfish	247.0	246.2	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_344	T12-318B	Ocean Farm Ltd	Donegal	Finfish	247.0	246.2	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_345	T12-318B	Ocean Farm Ltd	Donegal	Finfish	247.0	246.2	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_347	T12-381B	Ocean Farm Ltd	Donegal	Shellfish	247.1	246.3	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_348	T12-381A	Ocean Farm Ltd	Donegal	Shellfish	247.2	246.4	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_349	T12-276C	Ocean Farm Ltd	Donegal	Finfish	247.4	246.6	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_350	T12-266E	Ocean Farm Ltd	Donegal	Finfish	248.6	247.8	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_351	T12-404A	Natura Mussels Ltd	Donegal	Shellfish	249.2	248.4	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_352	T12-404B	Natura Mussels Ltd	Donegal	Shellfish	249.2	248.4	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_353	T12-266F	Ocean Farm Ltd	Donegal	Finfish	249.6	248.8	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_354	T12-266D	Ocean Farm Ltd	Donegal	Finfish	249.7	248.9	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_355	T12-266C	Ocean Farm Ltd	Donegal	Finfish	250.1	249.3	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_356	T12-064A	Gerard McMenamin	Donegal	Shellfish	250.2	249.4	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_357	T12-425A	Natura Mussels Ltd	Donegal	Shellfish	250.3	249.5	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_358	T12-456A	Ballyloughan Shellfish Ltd	Donegal	Shellfish	250.5	249.7	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_359	T12-266A	Ocean Farm Ltd	Donegal	Finfish	250.5	249.7	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_360	T12-425B	Natura Mussels Ltd	Donegal	Shellfish	250.6	249.8	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_361	T12-266B	Ocean Farm Ltd	Donegal	Finfish	250.6	249.8	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_362	T12-062B	Ballyloughan Shellfish Ltd	Donegal	Shellfish	250.7	249.9	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_363	T08-116A	Gerry Keyes	Clare	Shellfish	251.1	243.8	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_364	T08-117A	Rinemac Shellfish Ltd	Clare	Shellfish	251.2	244.0	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_365	T08-078	Gearoid Lyons	Clare	Shellfish	251.3	244.0	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_366	T08-055A	Martin McKeown	Clare	Shellfish	253.8	246.7	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_367	T09-010OFO	Beirtreach Teoranta	Galway	Shellfish	255.1	245.3	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_368	T09-149A	Bradán Beo Teoranta	Galway	Finfish	255.4	245.2	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_369	T09-009OFO	Beirtreach Teoranta	Galway	Shellfish	255.4	245.4	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_370	T09-119C	Bradán Beo Teoranta	Galway	Finfish	256.0	245.9	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_371	T09-141A	Bradán Beo Teoranta	Galway	Finfish	256.0	246.1	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_372	T12-539A	Francis McHugh & Andrew McHugh	Donegal	Aquatic Plant	256.0	255.2	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_373	T09-146A	Bradán Beo Teoranta	Galway	Finfish	256.8	246.8	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_374	T12-037B2	Lough Swilly Shellfish Growers Co-op Society Ltd	Donegal	Shellfish	257.9	257.0	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_375	T06-004	Tralee Oyster Fisheries Society Ltd	Kerry	Shellfish	258.0	253.3	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_376	T09-105C	Bradán Beo Teoranta	Galway	Finfish	258.0	248.2	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_377	T12-037B4	Lough Swilly Shellfish Growers Co-op Society Ltd	Donegal	Shellfish	258.1	257.2	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_378	T09-136A	Bradán Beo Teoranta	Galway	Finfish	258.1	248.2	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_379	T09-119B	Bradán Beo Teoranta	Galway	Finfish	258.5	248.4	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_380	T09-119A	Bradán Beo Teoranta	Galway	Finfish	258.9	248.8	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_381	T12-343A	Alan O'Sullivan	Donegal	Shellfish	259.0	258.1	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_382	T10-326A	Dinsdale Raddatz	Mayo	Shellfish	259.0	255.0	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_383	T10-309A	PKM Oysters Ltd	Mayo	Shellfish	259.2	255.2	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_384	T12-037A1	Lough Swilly Shellfish Growers Co-op Society Ltd	Donegal	Shellfish	259.4	258.5	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_385	T05-125N2	Bantry Harbour Mussels Ltd	Cork	Shellfish	259.4	258.9	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_386	T10-325A	Sean Bourke	Mayo	Shellfish	259.8	255.8	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_387	T10-005	Clew Bay Oyster CO-OP Society Ltd	Mayo	Shellfish	259.8	253.1	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_388	T09-114A	Bradán Beo Teoranta	Galway	Finfish	259.8	250.0	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_389	T05-069N2	Saltspray Mussel Technology Ltd	Cork	Shellfish	260.0	259.4	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_390	T05-060N6	Bantry Harbour Mussels Ltd	Cork	Shellfish	260.1	259.6	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_391	T09-203A	Bradán Beo Teoranta	Galway	Finfish	260.2	250.4	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_392	T05-053N1	SALTSPRAY MUSSEL TECHNOLOGY	Cork	Shellfish	260.4	259.8	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_393	T05-069N3	Saltspray Mussel Technology Ltd	Cork	Shellfish	260.4	259.9	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_394	T05-214N3	Fundy Shellfish Products Ltd	Cork	Shellfish	260.5	259.9	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_395	T05-067N5	Southward Ltd	Cork	Shellfish	260.5	260.0	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_396	T12-037B1	Lough Swilly Shellfish Growers Co-op Society Ltd	Donegal	Shellfish	260.7	259.8	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_397	T05-060N5	Bantry Harbour Mussels Ltd	Cork	Shellfish	260.7	260.1	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_398	T09-203B	Bradán Beo Teoranta	Galway	Finfish	260.9	251.0	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_399	T05-069N1	Saltspray Mussel Technology Ltd	Cork	Shellfish	260.9	260.4	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_400	T05-067N4	Southward Ltd	Cork	Shellfish	261.1	260.6	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_401	T12-037A2	Lough Swilly Shellfish Growers Co-op Society Ltd	Donegal	Shellfish	261.2	260.3	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_402	T05-069N4	Saltspray Mussel Technology Ltd	Cork	Shellfish	261.5	260.9	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_403	T05-125N1	Bantry Harbour Mussels Ltd	Cork	Shellfish	261.5	261.0	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_404	T05-069N7	Saltspray Mussel Technology Ltd	Cork	Shellfish	261.5	261.0	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_405	T05-069N8	Saltspray Mussel Technology Ltd	Cork	Shellfish	261.6	261.0	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_406	T05-060N1	Bantry Harbour Mussels Ltd	Cork	Shellfish	261.6	261.1	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_407	T05-067N6	Southward Ltd	Cork	Shellfish	261.6	261.1	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_408	T05-053N2	SALTSPRAY MUSSEL TECHNOLOGY	Cork	Shellfish	261.6	261.1	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_409	T12-251A	Conor Blake	Donegal	Shellfish	261.6	260.8	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_410	T10-293	Carrowholly Shellfish Ltd	Mayo	Shellfish	261.7	254.9	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_411	T05-060N3	Bantry Harbour Mussels Ltd	Cork	Shellfish	261.7	261.1	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_412	T10-299A	Irish Oysters Harvest Ltd	Mayo	Shellfish	261.7	254.8	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_413	T05-053N6	SALTSPRAY MUSSEL TECHNOLOGY	Cork	Shellfish	261.7	261.1	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_414	T05-053N5	SALTSPRAY MUSSEL TECHNOLOGY	Cork	Shellfish	261.7	261.1	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_415	T05-069N5	Saltspray Mussel Technology Ltd	Cork	Shellfish	261.7	261.2	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_416	T05-604A	Bantry Harbour Mussels Ltd	Cork	Shellfish	261.8	261.3	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_417	T05-053N3	SALTSPRAY MUSSEL TECHNOLOGY	Cork	Shellfish	261.8	261.3	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_418	T05-059N1	SALTSPRAY MUSSEL TECHNOLOGY	Cork	Shellfish	261.9	261.3	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_419	T10-245	Carrowholly Shellfish Ltd	Mayo	Shellfish	261.9	255.1	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_420	T05-060N2	Bantry Harbour Mussels Ltd	Cork	Shellfish	262.0	261.5	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_421	T05-059N2	SALTSPRAY MUSSEL TECHNOLOGY	Cork	Shellfish	262.0	261.5	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_422	T05-069N6	Saltspray Mussel Technology Ltd	Cork	Shellfish	262.2	261.6	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_423	T05-067N2	Southward Ltd	Cork	Shellfish	262.2	261.7	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_424	T05-214N2	Fundy Shellfish Products Ltd	Cork	Shellfish	262.3	261.8	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_425	T05-053N4	Fastnet Mussels Ltd	Cork	Shellfish	262.4	261.8	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_426	T05-067N3	Southward Ltd	Cork	Shellfish	262.4	261.9	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_427	T05-067N1	Southward Ltd	Cork	Shellfish	262.4	261.9	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_428	T05-060N4	Bantry Harbour Mussels Ltd	Cork	Shellfish	262.5	261.9	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_429	T05-214N1	Fundy Shellfish Products Ltd	Cork	Shellfish	262.5	262.0	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_430	T06-388A	Sam Lowes	Kerry	Shellfish	262.7	261.1	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_431	T10-298B	Sean O'Grady	Mayo	Shellfish	262.7	255.8	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_432	T05-600A	Whiddy Scallops Ltd	Cork	Shellfish	262.9	262.4	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_433	T05-276N2	Denis Hourihan	Cork	Shellfish	263.1	262.5	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_434	T10-292B	Padraic Gannon	Mayo	Shellfish	263.1	256.6	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_435	T10-336	Charles O'Malley	Mayo	Shellfish	263.1	256.2	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No

AQC_436	T05-058N8	Seal Harbour Enterprises Ltd	Cork	Shellfish	263.2	262.6	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_437	T10-278E	Sean O'Grady	Mayo	Shellfish	263.2	256.3	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_438	T05-599A	Whiddy Scallops Ltd	Cork	Shellfish	263.3	262.8	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_439	T09-114B	Bradán Beo Teoranta	Galway	Finfish	263.3	253.2	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_440	T10-335A	Rosmoney Shellfish Ltd	Mayo	Shellfish	263.3	256.4	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_441	T12-251B	Conor Blake	Donegal	Shellfish	263.3	262.5	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_442	T10-278D	Sean O'Grady	Mayo	Shellfish	263.4	256.5	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_443	T10-302B	Connemara Seafoods Ltd	Mayo	Shellfish	263.5	256.9	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_444	T05-276N1	Denis Hourihan	Cork	Shellfish	263.5	263.0	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_445	T05-058N7	Seal Harbour Enterprises Ltd	Cork	Shellfish	263.5	263.0	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_446	T05-020OFO	Glengarriff Fish Farming Co-op	Cork	Shellfish	263.5	262.9	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_447	T10-278C	Sean O'Grady	Mayo	Shellfish	263.5	256.7	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_448	T05-058N6	Seal Harbour Enterprises Ltd	Cork	Shellfish	263.6	263.0	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_449	T10-292A	Padraic Gannon	Mayo	Shellfish	263.6	257.1	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_450	T10-302A	Connemara Seafoods Ltd	Mayo	Shellfish	263.6	257.1	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_451	T10-298A	Donegal Aquaculture Services Ltd	Mayo	Shellfish	263.7	256.7	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_452	T10-202-1	Sean O'Grady	Mayo	Shellfish	263.7	256.8	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_453	T10-278B	Sean O'Grady	Mayo	Shellfish	263.7	256.8	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_454	T10-298C	Sean O'Grady	Mayo	Shellfish	263.8	256.9	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_455	T10-278A	Sean O'Grady	Mayo	Shellfish	263.9	257.0	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_456	T12-460A	Charlie McHugh	Donegal	Shellfish	264.1	263.3	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_457	T12-284	Atlantic Crab Ltd.	Donegal	Shellfish	264.2	263.3	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_458	T12-161A	Charles McHugh	Donegal	Shellfish	264.4	263.6	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_459	T12-403A	Charles McHugh	Donegal	Shellfish	264.4	263.6	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_460	T10-304D	Maitias Burke	Mayo	Shellfish	264.4	257.5	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_461	T10-304C	Maitias Burke	Mayo	Shellfish	264.5	257.6	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_462	T05-058N2	Seal Harbour Enterprises Ltd	Cork	Shellfish	264.7	264.1	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_463	T05-058N1	Seal Harbour Enterprises Ltd	Cork	Shellfish	264.7	264.2	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_464	T10-073B	Rosmoney Shellfish Ltd	Mayo	Shellfish	264.7	258.0	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_465	T05-058N3	Seal Harbour Enterprises Ltd	Cork	Shellfish	264.9	264.3	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_466	T12-162A	Charles McHugh	Donegal	Shellfish	264.9	264.1	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_467	T05-058N4	Seal Harbour Enterprises Ltd	Cork	Shellfish	265.0	264.4	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_468	T10-305A	Rosmoney Shellfish Ltd	Mayo	Shellfish	265.0	258.1	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_469	T05-311N1	Colin Whooley	Cork	Shellfish	265.0	264.5	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_471	T05-255N1	Michael Crowley	Cork	Shellfish	265.2	264.7	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_472	T09-093A	Marine Institute	Galway	Finfish	265.3	256.0	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_473	T05-255N3	Michael Crowley	Cork	Shellfish	265.3	264.7	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_474	T09-175B	Killary Fjord Shellfish Ltd	Galway	Shellfish	265.3	257.2	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_475	T09-392B	Black Pearl Shellfish Ltd	Galway	Shellfish	265.4	257.2	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_476	T05-172N1	Michael O'Neill	Cork	Shellfish	265.5	264.9	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_477	T05-211N1	Patrick & Daniel Murphy	Cork	Shellfish	265.5	264.9	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_478	T05-172N2	Michael O'Neill	Cork	Shellfish	265.5	265.0	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_479	T05-244N1	Patrick Leonard	Cork	Shellfish	265.5	265.0	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_480	T09-011AOFO	Beirtreach Teoranta	Galway	Shellfish	265.6	255.8	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_481	T05-568N1	Frank O'Dwyer	Cork	Shellfish	265.6	265.0	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_482	T05-212N1	Patrick Murphy	Cork	Shellfish	265.6	265.0	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_483	T09-135	Coleman McDonagh	Galway	Shellfish	265.6	257.5	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_484	T09-396B	Brian Spellman	Galway	Shellfish	265.6	257.5	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_485	T05-572N1	Brian Murnane & John O'Leary	Cork	Shellfish	265.6	265.1	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_486	T05-254N3	Turkhead Enterprises Ltd	Cork	Shellfish	265.7	265.2	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_487	T05-239N1	Michael, Ann & Dominic Casey	Cork	Shellfish	265.8	265.2	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_488	T05-357A	Skibbereen Shellfish Ltd	Cork	Shellfish	265.8	265.3	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_489	T09-422A	Online Mussels Ltd	Galway	Shellfish	265.8	257.7	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_490	T09-422-1A	Online Mussels Ltd	Galway	Shellfish	265.8	257.7	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_491	T09-317B	Purple Spade Ltd	Galway	Shellfish	265.8	257.7	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_492	T09-313B	Online Mussels Ltd	Galway	Shellfish	265.9	257.8	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_493	T05-082N4	Greenline Shellfish Ltd	Cork	Shellfish	265.9	265.4	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_494	T05-311N2	Colin Whooley	Cork	Shellfish	266.0	265.4	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_495	T09-184B	Kevin Lydon	Galway	Shellfish	266.0	257.9	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_496	T12-498A	Barry McGuiness	Donegal	Shellfish	266.0	265.2	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_497	T05-172N3	Michael O'Neill	Cork	Shellfish	266.0	265.5	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_498	T09-199B	Killary Fish Farming Co-operative Society Ltd	Galway	Shellfish	266.0	257.9	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_499	T06-201	Rosemary Purcell	Kerry	Shellfish	266.1	264.3	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_500	T06-005	Tralee Bay Shellfish Co-Op Society Ltd	Kerry	Shellfish	266.2	261.1	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_501	T05-244N2	Patrick Leonard	Cork	Shellfish	266.2	265.6	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_502	T12-211C	Inishowen Mussels Ltd	Donegal	Shellfish	266.2	265.3	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_503	T05-353NI	Raymond Duggan	Cork	Shellfish	266.2	265.7	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_504	T09-051B	Brid Kavanagh	Galway	Shellfish	266.2	258.1	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_505	T12-002	Beirtreach Teoranta	Donegal	Shellfish	266.3	265.5	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_506	T09-341B	Kevin Lydon	Galway	Shellfish	266.3	258.2	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_507	T09-308B	Michael Lydon	Galway	Shellfish	266.3	258.2	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_508	T09-296B	Online Mussels Ltd	Galway	Shellfish	266.3	258.2	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_509	T05-082N1	Greenline Shellfish Ltd	Cork	Shellfish	266.4	265.8	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_510	T05-255N2	Michael Crowley	Cork	Shellfish	266.4	265.8	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_511	T06-334N1	Frank McCarthy	Kerry	Shellfish	266.4	262.4	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_512	T05-254N5	Turkhead Enterprises Ltd	Cork	Shellfish	266.4	265.9	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_513	T09-171B	LETTERGESH MUSSELS LTD	Galway	Shellfish	266.4	258.3	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_514	T06-295A	Templenoe Oysters Ltd	Kerry	Shellfish	266.5	264.7	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_515	T09-389B	Black Pearl Shellfish Ltd	Galway	Shellfish	266.5	258.4	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_517	T09-361B	Jim O'Malley	Galway	Shellfish	266.6	258.4	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_518	T09-372B	Bartley O'Malley	Galway	Shellfish	266.6	258.4	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_519	T05-239N3	Michael, Ann & Dominic Casey	Cork	Shellfish	266.6	266.0	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_520	T09-363	Eddie Nee	Galway	Shellfish	266.6	258.5	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_521	T05-549A	Frank O'Dwyer	Cork	Shellfish	266.6	266.1	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_522	T06-179B	Kush Seafarms Ltd	Kerry	Shellfish	266.6	264.9	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_523	T09-388B	Peter Nee	Galway	Shellfish	266.8	258.6	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_524	T10-014AOFO	Michael Joseph Moran	Mayo	Shellfish	266.8	260.1	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_525	T05-311N3	Colin Whooley	Cork	Shellfish	266.8	266.2	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_526	T09-394B	Edward Nee Jnr	Galway	Shellfish	266.8	258.6	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_527	T05-281N1	Ronan O'Neill	Cork	Shellfish	266.8	266.2	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_528	T09-385B	Purple Spade Ltd	Galway	Shellfish	266.8	258.7	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_529	T09-076B	Michael Lydon	Galway	Shellfish	266.8	258.7	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No

AQC_530	T06-340B	Owen & P Teahan Shellfish Ltd	Kerry	Shellfish	266.9	262.9	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_531	T05-211N2	Patrick & Daniel Murphy	Cork	Shellfish	266.9	266.4	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_532	T05-498A	Patrick Murphy	Cork	Shellfish	267.0	266.4	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_533	T05-243N1	Denis Whooley	Cork	Shellfish	267.0	266.4	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_534	T06-301B	Sullivan, McCarthy Mussel Development Ltd	Kerry	Shellfish	267.0	263.1	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_535	T05-311N5	Colin Whooley	Cork	Shellfish	267.0	266.4	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_536	T05-005OFO	Atlantic Shellfish Ltd	Cork	Shellfish	267.0	266.4	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_537	T09-401B	Michael James Laffey	Galway	Shellfish	267.0	258.9	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_538	T05-239N2	Michael, Ann & Dominic Casey	Cork	Shellfish	267.2	266.6	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_539	T10-301C	Blackshell Farm Ltd	Mayo	Shellfish	267.2	260.7	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_540	T05-357D	Skibbereen Shellfish Ltd	Cork	Shellfish	267.2	266.6	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_541	T05-326N2	Atlantic Seafarms Ltd	Cork	Shellfish	267.2	266.7	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_542	T10-198	Patrick Gavin	Mayo	Shellfish	267.3	260.6	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_543	T05-005B	Skibbereen Shellfish Ltd	Cork	Shellfish	267.3	266.8	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_544	T05-483B	Frank O'Dwyer	Cork	Shellfish	267.4	266.8	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_545	T10-301B	Blackshell Farm Ltd	Mayo	Shellfish	267.4	260.9	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_546	T05-254N2	Turkhead Enterprises Ltd	Cork	Shellfish	267.5	267.0	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_547	T05-005D	Skibbereen Shellfish Ltd	Cork	Shellfish	267.5	267.0	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_548	T10-341	BLACKSHELL FARM LTD	Mayo	Shellfish	267.5	261.0	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_549	T10-301A	Blackshell Farm Ltd	Mayo	Aquatic Plant, Shellfish	267.5	261.0	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_550	T09-155	Comhlacht Bradain Chonamara Teo	Galway	Finfish	267.6	258.2	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_551	T05-005C	Skibbereen Shellfish Ltd	Cork	Shellfish	267.6	267.0	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_552	T05-433	Saltspray Mussel Technology Ltd	Cork	Shellfish	267.6	267.1	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_553	T06-277B	Michael Scannell	Kerry	Shellfish	267.7	263.8	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_554	T06-311A	Michael Scannell	Kerry	Shellfish	267.7	263.8	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_555	T05-311N4	Colin Whooley	Cork	Shellfish	267.7	267.2	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_556	T05-483C	Skibbereen Shellfish Ltd	Cork	Shellfish	267.7	267.2	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_557	T05-614A	Atlantic Sea Farm Ltd	Cork	Shellfish	267.7	267.2	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_558	T05-082N3	Greenline Shellfish Ltd	Cork	Shellfish	267.7	267.2	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_559	T05-319N1	Atlantic Seafarms Ltd	Cork	Shellfish	267.7	267.2	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_560	T12-127B	Sliogeisc Baigh Gaothbarra Teo	Donegal	Shellfish	267.8	267.0	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_561	T05-357B	Skibbereen Shellfish Ltd	Cork	Shellfish	267.8	267.3	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_562	T05-326N1	Atlantic Seafarms Ltd	Cork	Shellfish	267.9	267.3	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_563	T09-107	Comhlucht Bradain Chonamara Teo	Galway	Finfish	267.9	258.4	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_564	T12-546A	Sliogeisc Baigh Gaothbarra Teo	Donegal	Shellfish	267.9	267.1	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_565	T06-343A	Teahan Partners	Kerry	Shellfish	267.9	263.9	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_566	T05-254N4	Turkhead Enterprises Ltd	Cork	Shellfish	268.0	267.4	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_567	T05-254N1	Turkhead Enterprises Ltd	Cork	Shellfish	268.0	267.4	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_568	T05-357C	Skibbereen Shellfish Ltd	Cork	Shellfish	268.0	267.5	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_569	T05-474B	Sherkin Oysters Ltd	Cork	Shellfish	268.1	267.5	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_570	T05-058N5	Seal Harbour Enterprises Ltd	Cork	Shellfish	268.1	267.6	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_571	T05-311N6	Colin Whooley	Cork	Shellfish	268.1	267.6	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_572	T05-311N7	Colin Whooley	Cork	Shellfish	268.1	267.6	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_573	T05-474A	Sherkin Oysters Ltd	Cork	Shellfish	268.2	267.6	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_574	T06-277A	Michael Scannell	Kerry	Shellfish	268.2	264.4	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_575	T05-495A-N	Saltspray Mussel Technology Ltd	Cork	Shellfish	268.2	267.7	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_576	T06-277C	Michael Scannell	Kerry	Shellfish	268.3	264.4	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_577	T05-082N2	Greenline Shellfish Ltd	Cork	Shellfish	268.3	267.8	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_578	T05-252B	Sherkin Oysters Ltd	Cork	Shellfish	268.3	267.8	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_579	T05-506N1	Jonathon Harmon	Cork	Shellfish	268.3	267.8	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_580	T06-301A	Sullivan, McCarthy Mussel Development Ltd	Kerry	Shellfish	268.4	264.3	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_581	T09-317A	Purple Spade Ltd	Galway	Shellfish	268.4	260.2	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_582	T06-342A	Liam O'Connor	Kerry	Shellfish	268.5	264.6	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_583	T06-310B	John O'Sullivan	Kerry	Shellfish	268.5	264.6	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_584	T10-291A	John Sammon and Michael Sammon	Mayo	Shellfish	268.5	261.8	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_585	T09-313A	Online Mussels Ltd	Galway	Shellfish	268.5	260.4	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_586	T12-288B	Inishowen Mussels Ltd	Donegal	Shellfish	268.5	267.7	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_587	T05-252A	Sherkin Oysters Ltd	Cork	Shellfish	268.6	268.0	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_588	T06-304A	Teahan Partners	Kerry	Shellfish	268.6	264.5	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_589	T09-171A	LETTERGESH MUSSELS LTD	Galway	Shellfish	268.6	260.4	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_590	T06-291B	Cromane Oysters Ltd	Kerry	Shellfish	268.7	264.8	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_591	T06-310A	John O'Sullivan	Kerry	Shellfish	268.7	264.8	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_592	T06-259A	Pat Costello	Kerry	Shellfish	268.7	264.8	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_593	T12-483A	Sliogeisc Ba Traigheanna Teo	Donegal	Shellfish	268.7	267.9	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_594	T09-296A	Online Mussels Ltd	Galway	Shellfish	268.9	260.7	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_595	T05-440	Turk Head Enterprises	Cork	Aquatic Plant	268.9	268.3	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_596	T12-482A	Sliogeisc Ba Traigheanna Teo	Donegal	Shellfish	268.9	268.1	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_597	T05-252D	Sherkin Oysters Ltd	Cork	Shellfish	268.9	268.4	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_599	T06-291A	Cromane Oysters Ltd	Kerry	Shellfish	269.0	265.1	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_600	T10-308A	SEAFAYRE LTD	Mayo	Aquatic Plant, Shellfish	269.0	262.3	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_601	T09-388A	Peter Nee	Galway	Shellfish	269.0	260.8	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_602	T05-598A	Michael Crowley	Cork	Shellfish	269.0	268.5	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_603	T05-557N1	Michael Collins	Cork	Shellfish	269.0	268.5	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_604	T05-554N1	Atlantic Seafarms Ltd	Cork	Shellfish	269.0	268.5	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_605	T09-361A	Jim O'Malley	Galway	Shellfish	269.0	260.9	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_606	T05-559N1	Jonathan Harmon	Cork	Shellfish	269.0	268.5	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_607	T05-562N1	Patrick J Leonard	Cork	Shellfish	269.0	268.5	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_608	T09-507A	Killary Fjord Shellfish Ltd	Galway	Shellfish	269.1	260.9	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_609	T12-484A	Sliogeisc Ba Traigheanna Teo	Donegal	Shellfish	269.2	268.4	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_610	T10-067A	Feirm Farraige Oilean Chliara Teo	Mayo	Finfish	269.2	262.7	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_611	T06-339A	Cromane Point Oysters Ltd	Kerry	Shellfish	269.2	265.4	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_612	T06-267C	Cromane Point Oysters Ltd	Kerry	Shellfish	269.3	265.4	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_613	T12-490A	Oisiri Min An Chairn Teoranta	Donegal	Shellfish	269.3	268.5	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_614	T06-429A	Dingle Bay Shellfish Ltd	Kerry	Shellfish	269.3	265.2	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_616	T06-340A	Dingle Bay Shellfish Ltd	Kerry	Shellfish	269.4	265.3	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_617	T12-217A	Martin Brennan	Donegal	Shellfish	269.4	268.6	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_618	T12-412A	Sliogeisc Ba Traigheanna Teo	Donegal	Shellfish	269.4	268.6	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_619	T10-054B	Feirm Farraige Oilean Chliara Teo	Mayo	Finfish	269.5	262.9	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No

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AQC_710	T12-128C	Sligeisc na Rossan	Donegal	Shellfish	272.1	271.2	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_711	T05-122A	Murphy's Irish Seafood Ltd	Cork	Finfish	272.1	271.6	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_712	T12-525A	Ryan Moore	Donegal	Shellfish	272.1	271.3	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_713	T10-276	SOFI Shellfish Ltd	Mayo	Shellfish	272.1	265.6	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_714	T09-400	Liam Gerard Laffey	Galway	Shellfish	272.2	264.1	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_715	T12-449A	Sligeisc Na Rossan	Donegal	Shellfish	272.2	271.4	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_716	T09-401A	Michael James Laffey	Galway	Shellfish	272.2	264.1	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_717	T10-338A	SOFI Shellfish Ltd	Mayo	Shellfish	272.3	265.8	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_718	T12-128D	Sligeisc na Rossan	Donegal	Shellfish	272.3	271.5	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_719	T12-389B	David Gallagher	Donegal	Shellfish	272.3	271.5	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_720	T10-285A	Peter McManamon	Mayo	Shellfish	272.4	265.9	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_721	T10-295A	Fergal Guilfoyle	Mayo	Shellfish	272.4	265.9	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_722	T10-337	Atlantic Greenway Oysters Ltd	Mayo	Shellfish	272.4	266.0	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_723	T10-283A	Thomas Muldoon	Mayo	Shellfish	272.4	265.9	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_724	T12-477A	Sligeisc Na Rossan	Donegal	Shellfish	272.5	271.6	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_725	T09-399	Black Pearl Shellfish Ltd	Galway	Shellfish	272.5	264.4	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_726	T09-397A	Online Mussels Ltd	Galway	Shellfish	272.5	264.4	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_727	T12-389A	David Gallagher	Donegal	Shellfish	272.5	271.7	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_728	T05-558N1	Atlantic Seafarms Ltd	Cork	Shellfish	272.6	272.0	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_729	T12-527	Cathal McCauley	Donegal	Shellfish	272.7	271.8	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_730	T12-480A	Lee Hunter	Donegal	Shellfish	272.8	271.9	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_731	T12-053B	Mulroy Bay Mussels Ltd	Donegal	Shellfish	272.8	272.0	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_732	T12-053C	Mulroy Bay Mussels Ltd	Donegal	Shellfish	272.8	272.0	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_733	T12-479A	Jago Moulton	Donegal	Shellfish	272.9	272.1	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_734	T12-288C	Inishowen Mussels Ltd	Donegal	Shellfish	272.9	272.1	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_735	T05-536N1	Michael Casey	Cork	Shellfish	273.1	272.5	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_736	T12-260B	Iasc Sliogach Uisce Leathan Teo	Donegal	Shellfish	273.3	272.4	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_737	T12-209B	Iasc Sliogach Uisce Leathan Teo	Donegal	Shellfish	273.5	272.6	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_738	T05-497N1	Turkhead Enterprises Ltd	Cork	Shellfish	273.5	272.9	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_739	T12-209	Iasc Sliogach Uisce Leathan Teo	Donegal	Shellfish	273.6	272.7	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_740	T05-430A	West Cork Seafoods Ltd	Cork	Shellfish	273.6	273.1	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_741	T09-143	Mr. Padraic Doherty (in trust)	Galway	Finfish	273.6	265.5	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_742	T12-212	Iasc Sliogach Uisce Leathan Teo	Donegal	Shellfish	273.6	272.7	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_743	T12-203E	North West Shell Fish Ltd	Donegal	Shellfish	273.7	272.8	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_744	T12-209A	Iasc Sliogach Uisce Leathan Teo	Donegal	Shellfish	273.7	272.9	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_745	T10-056	Blackshell Farm Ltd	Mayo	Shellfish	273.8	267.2	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_746	T12-252B	Martin Coll	Donegal	Shellfish	273.9	273.0	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_747	T12-252A	Martin Coll	Donegal	Shellfish	273.9	273.0	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_748	T12-252	Martin Coll	Donegal	Shellfish	273.9	273.0	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_749	T12-011	Hector McIlwaine	Donegal	Shellfish	274.1	273.2	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_750	T12-387A	North West Shell Fish Ltd	Donegal	Shellfish	274.1	273.2	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_751	T12-011-1	Hector McIlwaine	Donegal	Shellfish	274.1	273.3	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_752	T12-260C	Iasc Sliogach Uisce Leathan Teo	Donegal	Shellfish	274.2	273.3	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_753	T05-555A	Bradan Fanad Teoranta	Cork	Finfish	274.3	273.8	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_754	T12-260A	Iasc Sliogach Uisce Leathan Teo	Donegal	Shellfish	274.4	273.5	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_755	T12-387B	North West Shell Fish Ltd	Donegal	Shellfish	274.4	273.6	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_756	T12-203J	North West Shell Fish Ltd	Donegal	Shellfish	274.5	273.6	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_757	T06-039A	Sneem Fishermens Co-Op Society Ltd	Kerry	Shellfish	274.5	272.7	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_759	T12-077F	Hydro Seafood Fanad	Donegal	Finfish	274.8	273.9	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_760	T12-203C	North West Shell Fish Ltd	Donegal	Shellfish	274.9	274.0	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_761	T12-203D	North West Shell Fish Ltd	Donegal	Shellfish	274.9	274.1	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_762	T12-497A	Lorraine Gallagher	Donegal	Aquatic Plant	275.4	274.5	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_763	T06-356A	Sneem Fishermens Co-Op Society Ltd	Kerry	Shellfish	275.5	273.8	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_764	T05-625A	Dan O'Shea	Cork	Shellfish	275.7	275.2	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_765	T12-203K	North West Shell Fish Ltd	Donegal	Shellfish	275.8	274.9	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_766	T12-387G 3	North West Shell Fish Ltd	Donegal	Shellfish	276.4	275.5	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_767	T12-77 E	Comhlucht Iascaireachta Fanad Teoranta	Donegal	Finfish	276.4	275.5	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_768	T12-077E	Hydro Seafood Fanad	Donegal	Finfish	276.5	275.6	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_769	T09-143A	Mr. Padraic Doherty (in trust)	Galway	Finfish	276.5	268.5	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_770	T12-387G 2	North West Shell Fish Ltd	Donegal	Shellfish	276.7	275.9	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_771	T05-623A	Dan O'Shea	Cork	Shellfish	276.8	276.3	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_772	T12-205A	Ostre' An Teoranta	Donegal	Shellfish	277.2	276.4	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_773	T12-203G	North West Shell Fish Ltd	Donegal	Shellfish	277.3	276.4	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_774	T12-287A	David Gallagher	Donegal	Shellfish	277.3	276.5	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_775	T12-387G 1	North West Shell Fish Ltd	Donegal	Shellfish	277.4	276.5	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_776	T12-506A	Ostre' An Teoranta	Donegal	Shellfish	277.4	276.6	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_777	T12-205C	Ostre' An Teoranta	Donegal	Shellfish	277.4	276.6	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_778	T12-423A	Ostre' An Teoranta	Donegal	Shellfish	277.4	276.6	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_779	T12-315A	Ostre' An Teoranta	Donegal	Shellfish	277.5	276.6	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_781	T12-205B	Ostre' An Teoranta	Donegal	Shellfish	277.5	276.7	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_782	T12-077D	Hydro Seafood Fanad	Donegal	Finfish	277.5	276.6	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_783	T12-303A	Conal Hunter	Donegal	Shellfish	277.5	276.7	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_784	T06-315N1	Caragh Clams Ltd	Kerry	Shellfish	277.6	273.9	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_785	T12-304A	Charlie Doherty	Donegal	Shellfish	277.6	276.8	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_786	T12-399A	Conal Hunter	Donegal	Shellfish	277.6	276.8	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_787	T06-280B	Jean Yves Letanneur	Kerry	Shellfish	277.7	275.9	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_788	T12-302A	Patrick Hunter	Donegal	Shellfish	277.7	276.9	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_789	T12-400A	Philip Doherty	Donegal	Shellfish	277.7	276.9	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_790	T12-302B	CONNOR HUNTER	Donegal	Shellfish	277.8	276.9	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_792	T12-424A	Ostre' An Teoranta	Donegal	Shellfish	277.8	277.0	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_793	T12-203F	North West Shell Fish Ltd	Donegal	Shellfish	277.8	276.9	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_794	T12-287	David Gallagher	Donegal	Shellfish	277.8	277.0	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_795	T12-399B	Conal Hunter	Donegal	Shellfish	277.9	277.1	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_796	T05-084B	Dan O'Shea	Cork	Shellfish	277.9	277.3	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_797	T12-422A	Ostre' An Teoranta	Donegal	Shellfish	278.0	277.2	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_798	T12-77 B&D	Comhlucht Iascaireachta Fanad Teoranta	Donegal	Finfish	278.0	277.1	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_799	T12-415A	Stephen Kearney	Donegal	Shellfish	278.0	277.1	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_800	T12-420A	Anthony Kearney	Donegal	Shellfish	278.0	277.1	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_801	T12-406A	Shaun McDaid	Donegal	Shellfish	278.0	277.1	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_802	T12-077B	Hydro Seafood Fanad	Donegal	Finfish	278.1	277.2	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_803	T12-360A	Patrick McDaid	Donegal	Shellfish	278.1	277.2	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_804	T12-85B	Comhlucht Iascaireachta Fanad Teoranta	Donegal	Finfish	278.1	277.2	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No

AQC_805	T12-523A	Kearney Oysters Ltd	Donegal	Shellfish	278.1	277.2	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_806	T12-418A	Stephen Kearney	Donegal	Shellfish	278.1	277.2	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_807	T12-530A	John Friel (Friel Agri Marine)	Donegal	Shellfish	278.1	277.2	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_808	T06-332A	Sneem Fishermens Co-Op Society Ltd	Kerry	Shellfish	278.2	276.5	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_809	T12-231	Stephen Kearney	Donegal	Shellfish	278.2	277.3	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_810	T05-084C	Dan O'Shea	Cork	Shellfish	278.2	277.7	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_811	T12-549A	ASK Oysters Ltd	Donegal	Shellfish	278.3	277.4	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_812	T12-429A	Stephen Kearney	Donegal	Shellfish	278.3	277.4	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_813	T12-316A	Inish Sal Teoranta	Donegal	Shellfish	278.3	277.5	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_814	T12-493A	Inish Sal Teoranta	Donegal	Shellfish	278.3	277.5	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_815	T12-215	Anthony Kearney	Donegal	Shellfish	278.4	277.5	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_816	T12-427B	Philip C Doherty	Donegal	Shellfish	278.4	277.5	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_817	T12-522A	Oran Kearney	Donegal	Shellfish	278.4	277.5	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_818	T12-550A	ASK Oysters Ltd	Donegal	Shellfish	278.4	277.5	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_819	T05-624A	Dan O'Shea	Cork	Shellfish	278.4	277.8	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_820	T12-281B	Philip Doherty	Donegal	Shellfish	278.4	277.5	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_821	T05-084A	Dan O'Shea	Cork	Shellfish	278.4	277.8	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_822	T12-427A	Philip C Doherty	Donegal	Shellfish	278.4	277.5	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_823	T06-280A	Jean Yves Letanneur	Kerry	Shellfish	278.4	276.7	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_825	T06-280-2	Jean Yves Letanneur	Kerry	Shellfish	278.4	276.7	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_826	T12-528A	Hurrikayn Oysters Ltd	Donegal	Shellfish	278.4	277.5	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_827	T12-520A	Kearney Oysters Ltd	Donegal	Shellfish	278.5	277.6	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_828	T12-439A	James Ball	Donegal	Shellfish	278.5	277.6	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_829	T12-203H	North West Shell Fish Ltd	Donegal	Shellfish	278.6	277.7	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_830	T12-447A	Patrick McDaid	Donegal	Shellfish	278.6	277.7	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_831	T12-359A	Bells Isle Seafoods Ltd	Donegal	Shellfish	278.6	277.7	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_832	T06-390A	Sarah Walker	Kerry	Shellfish	278.6	277.3	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_833	T12-367A	James Ball	Donegal	Shellfish	278.6	277.7	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_834	T12-322A	James Ball	Donegal	Shellfish	278.6	277.7	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_835	T12-363A	Bells Isle Seafoods Ltd	Donegal	Shellfish	278.6	277.7	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_836	T12-436D	Danny McDermott	Donegal	Shellfish	278.6	277.7	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_837	T12-333A	Danny McDermott	Donegal	Shellfish	278.6	277.7	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_838	T12-436C	Danny McDermott	Donegal	Shellfish	278.7	277.8	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_839	T12-375A	Barr Oysters Ltd	Donegal	Shellfish	278.7	277.8	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_840	T12-332A	Barr Oysters Ltd	Donegal	Shellfish	278.7	277.8	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_841	T12-345A	Derek Diver	Donegal	Shellfish	278.8	277.8	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_842	T12-190A	Derek Diver	Donegal	Shellfish	278.8	277.9	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_843	T12-345A-1	Derek Diver	Donegal	Shellfish	278.8	277.9	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_844	T12-351A	Gerry Diver	Donegal	Shellfish	278.8	277.9	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_845	T12-436B	Danny McDermott	Donegal	Shellfish	278.8	277.9	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_846	T12-358A	Danny McDermott	Donegal	Shellfish	278.8	277.9	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_847	T06-149B	Ross Shellfish Ltd	Kerry	Shellfish	278.8	277.5	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_848	T12-368A	Crocknagee Oysters Ltd	Donegal	Shellfish	278.8	277.9	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_849	T12-459A	Derek Diver	Donegal	Shellfish	278.8	277.9	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_850	T12-486A	Martin Boyle	Donegal	Shellfish	278.8	278.0	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_851	T12-457A	Derek Diver	Donegal	Shellfish	278.8	277.9	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_852	T05-408A	Bantry Bay Mussels Ltd	Cork	Shellfish	278.8	278.3	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_853	T12-436A	Danny McDermott	Donegal	Shellfish	278.8	277.9	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_854	T12-492A	Derek Diver	Donegal	Shellfish	278.8	277.9	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_855	T12-468A	Danny McDermott	Donegal	Shellfish	278.8	277.9	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_856	T12-345B-1	Derek Diver	Donegal	Shellfish	278.8	277.9	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_857	T12-386A	Alan Rankin	Donegal	Shellfish	278.9	278.0	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_858	T12-547A	Daniel McGonigle	Donegal	Shellfish	278.9	278.0	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_859	T12-384A	Philip Doherty	Donegal	Shellfish	278.9	278.0	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_860	T12-454A	William Coffey	Donegal	Shellfish	278.9	278.0	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_861	T12-473A	Michael Farren	Donegal	Shellfish	279.0	278.1	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_862	T12-227	Alan & Cara Byrne	Donegal	Shellfish	279.0	278.1	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_863	T09-370A	Anthony Coyne	Galway	Shellfish	279.0	270.4	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_864	T12-353A	William Coffey	Donegal	Shellfish	279.0	278.1	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_865	T06-064B	St. Killians Harvest Ltd.	Cork	Finfish	279.1	277.7	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_866	T12-244A	Hurrikayn Oysters Ltd	Donegal	Shellfish	279.1	278.2	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_868	T12-383A	Hurrikayn Oysters Ltd	Donegal	Shellfish	279.2	278.3	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_869	T12-553A	William Coffey	Donegal	Shellfish	279.2	278.3	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_870	T12-387E	North West Shell Fish Ltd	Donegal	Shellfish	279.3	278.4	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_871	T12-385A	John McKinney	Donegal	Shellfish	279.3	278.4	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_872	T09-004OFO	Cleggan Lobster Fisheries	Galway	Shellfish	279.3	270.8	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_873	T06-190	Declan O'Sullivan	Kerry	Shellfish	279.3	278.0	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_874	T12-177	John McKinney	Donegal	Shellfish	279.4	278.5	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_875	T12-437B	John McKinney	Donegal	Shellfish	279.4	278.5	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_877	T12-548A	Eamonn Scott	Donegal	Shellfish	279.4	278.5	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_878	T12-355A	Shaun McKinney	Donegal	Shellfish	279.5	278.5	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_879	T12-543A	Oceanic Organic Oysters Ltd	Donegal	Shellfish	279.5	278.6	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_880	T12-558A	Oceanic Organic Oysters Ltd	Donegal	Shellfish	279.5	278.6	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_881	T12-544A	Oceanic Organic Oysters Ltd	Donegal	Shellfish	279.5	278.6	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_882	T12-336A	John McKinney	Donegal	Shellfish	279.5	278.6	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_883	T12-437A	John McKinney	Donegal	Shellfish	279.5	278.6	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_884	T12-466A	James Ball	Donegal	Shellfish	279.5	278.6	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_885	T12-504A	James Ball	Donegal	Shellfish	279.6	278.7	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_886	T12-77 C	Comhlucht Iascaireachta Fanad Teoranta	Donegal	Finfish	279.6	278.7	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_887	T06-114	Kush Seafarms Ltd	Kerry	Shellfish	279.6	278.2	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_889	T05-617A	Paul Cobb	Cork	Aquatic Plant	279.6	279.1	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_890	T12-571A	James Ball	Donegal	Shellfish	279.6	278.7	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_891	T12-203B	North West Shell Fish Ltd	Donegal	Shellfish	279.6	278.7	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_892	T12-450B	Patrick Porteous	Donegal	Shellfish	279.6	278.7	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_893	T12-229	Patrick Porteous	Donegal	Shellfish	279.6	278.7	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_894	T09-488A	Lorcan Folan	Galway	Shellfish	279.7	271.1	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_895	T12-077C	Hydro Seafood Fanad	Donegal	Finfish	279.7	278.8	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_896	T12-540A	Philip Doherty	Donegal	Shellfish	279.7	278.8	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_897	T12-450A	Patrick Porteous	Donegal	Shellfish	279.7	278.8	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_898	T12-444A	Philip Doherty	Donegal	Shellfish	279.7	278.8	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_899	T12-352A	Philip Doherty	Donegal	Shellfish	279.7	278.8	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_900	T12-301	Philip Doherty	Donegal	Shellfish	279.8	278.9	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No

AQC_901	T06-064A	St. Killians Harvest Ltd	Kerry	Finfish	279.8	278.5	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_902	T12-387F	North West Shell Fish Ltd	Donegal	Shellfish	279.8	279.0	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_903	T12-453A	Oceanic Organic Oysters Ltd	Donegal	Shellfish	279.9	279.0	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_904	T06-131	Patrick Cronin	Kerry	Shellfish	279.9	278.5	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_905	T12-570A	Oceanic Organic Oysters Ltd	Donegal	Shellfish	279.9	279.0	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_906	T12-568A	Oceanic Organic Oysters Ltd	Donegal	Shellfish	279.9	279.0	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_907	T12-230A	Oceanic Organic Oysters Ltd	Donegal	Shellfish	279.9	279.0	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_909	T12-563A	Atlantic Crab Ltd	Donegal	Shellfish	279.9	279.0	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_910	T06-106	Shamrock Shellfish Ltd	Kerry	Shellfish	279.9	278.5	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_911	T12-475A	Michael & Eunan McLaughlin	Donegal	Shellfish	279.9	279.0	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_912	T12-274A	Alan McGlinchey	Donegal	Shellfish	280.0	279.1	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_914	T12-426A	James Ball	Donegal	Shellfish	280.0	279.1	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_915	T06-035A	Shamrock Shellfish Co.	Kerry	Shellfish	280.0	278.6	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_916	T12-369A	Atlantic Crab Ltd	Donegal	Shellfish	280.0	279.1	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_918	T05-587A	Allihies Seafood Ltd	Cork	Aquatic Plant	280.0	279.5	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_919	T12-434A	Michael Barr	Donegal	Shellfish	280.1	279.2	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_920	T12-414A	John Coll	Donegal	Shellfish	280.1	279.2	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_921	T12-471A	Marjorie Doherty	Donegal	Shellfish	280.2	279.3	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_922	T05-607A	Dingle Bay Seaweed Ltd	Cork	Aquatic Plant	280.3	279.7	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_923	T12-542A	Cathal McCorkell	Donegal	Shellfish	280.4	279.5	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_924	T12-470A	Eunan McLaughlin	Donegal	Shellfish	280.5	279.6	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_925	T10-043A	Curraun Fisheries Ltd	Mayo	Shellfish	280.5	274.1	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_927	T06-033A	Carl Daly	Kerry	Shellfish	280.7	279.4	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_928	T05-622A	Dan O shea	Cork	Shellfish	280.8	280.2	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_929	T12-387D	North West Shell Fish Ltd	Donegal	Shellfish	280.8	279.9	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_930	T09-370	Anthony Coyne	Galway	Shellfish	280.8	272.3	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_931	T06-024	Muskerry Seafoods (Kerry) Ltd	Kerry	Shellfish	280.8	279.5	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_932	T05-444E	Comhlucht Iascaireachta Fanad Teoranta	Cork	Finfish	280.8	280.3	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_933	T12-387C	North West Shell Fish Ltd	Donegal	Shellfish	280.9	280.0	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_934	T09-417B	Josie King	Galway	Shellfish	281.0	271.9	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_935	T09-267	Michael O'Malley	Galway	Shellfish	281.1	272.0	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_936	T09-404A	Michael O'Malley	Galway	Shellfish	281.1	272.5	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_937	T12-552B	Manus Heraghty	Donegal	Shellfish	281.2	280.3	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_938	T12-552A	Manus Heraghty	Donegal	Shellfish	281.2	280.3	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_939	T09-428A	Michael O'Malley	Galway	Shellfish	281.2	272.2	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_940	T06-154	Paul Kelly	Kerry	Shellfish	281.2	279.9	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_941	T06-327A	Declan O'Sullivan	Kerry	Shellfish	281.2	279.8	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_943	T12-77-7	Comhlucht Iascaireachta Fanad Teoranta	Donegal	Finfish	281.2	280.3	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_944	T12-203A	North West Shell Fish Ltd	Donegal	Shellfish	281.3	280.4	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_945	T12-085	Hydro Seafood Fanad	Donegal	Finfish	281.3	280.5	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_946	T09-426-1A	Josie King	Galway	Shellfish	281.4	272.3	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_947	T09-417A	Josie King	Galway	Shellfish	281.4	272.3	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_948	T09-095A	Tully Mountain Salmon Farm Ltd.	Galway	Finfish	281.4	272.9	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_949	T05-586A	Allihies Seafood Ltd	Cork	Aquatic Plant	281.4	280.9	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_950	T09-417C	Josie King	Galway	Shellfish	281.5	272.4	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_951	T12-77A	Comhlucht Iascaireachta Fanad Teoranta	Donegal	Finfish	281.5	280.6	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_952	T09-521A	Josie King	Galway	Shellfish	281.5	272.5	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_953	T12-077A	Hydro Seafood Fanad	Donegal	Finfish	281.6	280.7	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_954	T05-432D	Crookhaven Fishermen's Association Ltd	Cork	Aquatic Plant, Shellfish	281.7	281.1	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_955	T09-517A	Josie King	Galway	Shellfish	281.7	272.6	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_957	T09-369	Lorcan Folan	Galway	Shellfish	281.8	273.2	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_958	T05-444D	Comhlucht Iascaireachta Fanad Teoranta	Cork	Finfish	281.9	281.4	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_959	T09-008OFO	Ardbear Sea Farms Ltd	Galway	Shellfish	282.0	273.0	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_960	T10-058A	Feirm Farraige Oilean Chliara Teo	Mayo	Finfish	282.0	274.8	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_961	T09-096B	Ardbear Sea Farms Ltd	Galway	Finfish	282.2	273.1	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_963	T05-591A	Wild Atlantic Sea Products Ltd	Cork	Aquatic Plant	283.0	282.4	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_964	T05-258	Kush Seafarms Ltd	Cork	Shellfish	283.2	281.7	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_965	T09-492A	Michael O'Malley	Galway	Shellfish	283.2	274.8	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_966	T12-365A	Celtic Kerber Ltd	Donegal	Shellfish	283.4	282.5	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_967	T06-039C	Sneem Fishermens Co-Op Society Ltd	Kerry	Shellfish	283.4	281.7	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_968	T09-127	Ardbear Sea Farms Ltd	Galway	Finfish	283.4	274.4	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_969	T05-160A	Ardgroom Shellfish Ltd	Cork	Shellfish	283.5	282.2	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_970	T09-132A	Gerry O'Donoghue	Galway	Finfish	283.5	275.0	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_971	T05-348A	Pallas Fish Farms Ltd	Cork	Shellfish	283.5	282.1	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_972	T12-364B	John Boyle	Donegal	Shellfish	283.6	282.7	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_973	T12-364A	John Boyle	Donegal	Shellfish	283.6	282.8	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_974	T06-338A	John O'Brien and Timmy McCarthy	Kerry	Shellfish	283.7	281.9	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_975	T12-365B	Celtic Kerber Ltd	Donegal	Shellfish	283.7	282.8	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_977	T05-044	Kush Seafarms Ltd	Cork	Shellfish	283.8	282.5	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_978	T12-365C	Celtic Kerber Ltd	Donegal	Shellfish	283.8	283.0	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_979	T05-317A	John O'Shea	Cork	Shellfish	283.9	282.5	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_980	T12-305B	Celtic Kerber Ltd	Donegal	Shellfish	284.1	283.3	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_981	T05-317B	John O'Shea	Cork	Shellfish	284.2	282.8	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_982	T05-160B	Ardgroom Shellfish Ltd	Cork	Shellfish	284.2	282.8	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_983	T05-225	Patricia & Seán Daly	Cork	Shellfish	284.2	282.8	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_984	T09-140	Mannin Bay Salmon Company Ltd	Galway	Finfish	284.2	275.1	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_985	T05-348B	Pallas Fish Farms Ltd	Cork	Shellfish	284.5	283.1	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_986	T05-129	Kush Seafarms Ltd	Cork	Shellfish	284.5	283.2	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_987	T05-041A	Patricia & Séan Daly	Cork	Shellfish	284.6	283.2	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_988	T12-193A	Owen Curran	Donegal	Shellfish	284.7	283.8	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_989	T05-157	Pallas Fish Farms Ltd	Cork	Shellfish	284.9	283.6	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_990	T12-305A	Celtic Kerber Ltd	Donegal	Shellfish	285.0	284.2	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_991	T12-326A	John Boyle	Donegal	Shellfish	285.2	284.3	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_993	T05-601A	G & B Barge Operators Ltd	Cork	Shellfish	285.4	284.8	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_994	T05-535A	Rodeen Fish Farm Ltd	Cork	Shellfish	285.5	284.9	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_995	T10-058B	Feirm Farraige Oilean Chliara Teo	Mayo	Finfish	285.6	278.4	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_996	T10-315A	Brendan Calvey	Mayo	Shellfish	285.6	279.3	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_997	T05-427-2	Comhlucht Iascaireachta Fanad Teoranta	Cork	Finfish	285.8	285.1	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_998	T10-332A	Michael McTigue	Mayo	Shellfish	286.2	279.9	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_999	T05-534B	Cormorant Mussel Ltd	Cork	Shellfish	286.2	285.5	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No

AQC_1000	T05-065N1	Cormorant Mussel Ltd	Cork	Shellfish	286.3	285.6	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_1001	T05-594A	Dingle Bay Seaweed Ltd	Cork	Aquatic Plant, Echinoderm, Shellfish	286.3	285.7	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_1002	T05-534A	Cormorant Mussel Ltd	Cork	Shellfish	286.5	285.8	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_1003	T10-314A	Brendan Calvey	Mayo	Shellfish	286.6	280.4	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_1004	T10-297A	Padraic Gannon	Mayo	Shellfish	286.8	280.0	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_1005	T10-212-2	Sciana Mara Teo	Mayo	Shellfish	286.9	280.0	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_1006	T06-012OFO	An Runai, Comharchumann Forbartha an Leith	Kerry	Shellfish	286.9	281.9	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_1007	T05-340-1	Pallas Fish Farms Ltd	Cork	Shellfish	287.0	285.6	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_1008	T10-274	Sciana Mara Teo	Mayo	Shellfish	287.0	280.2	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_1009	T10-212	Sciana Mara Teo	Mayo	Shellfish	287.1	280.2	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_1010	T10-282A	Aisling O'Leary	Mayo	Shellfish	287.2	280.4	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_1012	T10-313A	Thomas Henry	Mayo	Shellfish	287.4	280.7	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_1013	T05-432C	Crookhaven Fishermen's Association Ltd	Cork	Aquatic Plant, Shellfish	287.4	286.8	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_1014	T10-054	Marine Harvest Ireland Ltd	Mayo	Finfish	287.5	280.6	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_1015	T10-129C	Joseph Healy	Mayo	Shellfish	287.5	280.9	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_1016	T10-317A	Neil Kilbane	Mayo	Shellfish	287.5	280.9	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_1017	T10-318A	Neil Kilbane	Mayo	Shellfish	287.6	281.0	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_1018	T10-129B	Joseph Healy	Mayo	Shellfish	287.7	281.1	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_1019	T10-129A	Joseph Healy	Mayo	Shellfish	287.7	281.1	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_1020	T05-432B	Crookhaven Fishermen's Association Ltd	Cork	Aquatic Plant, Shellfish	287.8	287.3	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_1021	T10-312A	Kieran Grealis	Mayo	Shellfish	287.9	281.8	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_1023	T10-284B	Michael Kilbane	Mayo	Shellfish	288.3	281.6	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_1024	T10-311	Kieran Grealis	Mayo	Shellfish	288.3	282.2	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_1025	T05-464	Rodeen Fish Farm Ltd	Cork	Shellfish	288.4	287.8	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_1026	T10-284A	Michael Kilbane	Mayo	Shellfish	288.5	281.8	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_1027	T05-369	Gerard J Lynch	Cork	Shellfish	288.5	287.1	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_1028	T09-434	Cleggan Seaweed Ltd	Galway	Aquatic Plant	288.6	280.0	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_1029	T10-307C	Francis Sweeney	Mayo	Shellfish	288.9	282.5	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_1030	T05-399	John O'Shea	Cork	Shellfish	288.9	287.5	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_1031	T05-425B	G & B Barge Operators Ltd	Cork	Shellfish	289.0	288.3	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_1032	T10-327A	Dooriel Fisheries Ltd	Mayo	Shellfish	289.1	282.9	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_1033	T05-577N1	Dean Murphy	Cork	Shellfish	289.3	288.6	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_1034	T05-432A	Crookhaven Fishermen's Association Ltd	Cork	Aquatic Plant, Shellfish	289.4	288.8	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_1035	T05-634A	Dean Murphy	Cork	Shellfish	289.5	288.8	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_1036	T10-330A	Hugh O'Malley	Mayo	Shellfish	290.6	284.2	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_1037	T10-331A	Hugh O'Malley	Mayo	Shellfish	290.7	284.3	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_1038	T06-064-7	Murphy's Irish Seafood Ltd	Kerry	Finfish	290.9	289.5	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_1039	T10-231	Kathleen Davitt	Mayo	Shellfish	290.9	284.5	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_1040	T10-310B	Irish Oysters Harvest Ltd	Mayo	Shellfish	291.5	285.1	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_1041	T10-323A	Michael Kilbane	Mayo	Shellfish	291.7	285.3	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_1042	T10-324A	Michael Kilbane	Mayo	Shellfish	291.7	285.3	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_1043	T10-310A	Irish Oysters Harvest Ltd	Mayo	Shellfish	291.8	285.4	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_1044	T05-233	Comhlucht Iascaireachta Fanad Teoranta	Cork	Finfish	294.0	292.7	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_1045	T05-233	Silver King Seafoods Ltd	Cork	Finfish	294.4	293.1	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_1046	T05-523A	Coulagh Bay Sea Farms	Cork	Aquatic Plant, Echinoderm, Shellfish	296.5	295.4	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_1047	T06-416A	Brian McCarthy	Kerry	Shellfish	297.2	294.0	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_1048	T10-081B	Tony McGrath	Mayo	Shellfish	297.3	292.5	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_1049	T10-081A	Tony McGrath	Mayo	Shellfish	297.5	292.7	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_1050	T10-320	Redrose Development Ltd	Mayo	Aquatic Plant	298.6	292.9	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_1051	T10-237	Gerard Heneghan	Mayo	Shellfish	299.5	294.0	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_1052	T10-319A	Redrose Development Ltd	Mayo	Aquatic Plant	299.7	294.6	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_1055	T06-366A	B.C. Shellfish Ltd	Kerry	Shellfish	302.0	298.8	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_1057	T06-365A	B.C. Shellfish Ltd	Kerry	Shellfish	302.1	298.9	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_1058	T06-389A	B.C. Shellfish Ltd	Kerry	Shellfish	302.2	299.0	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_1062	T10-028B	North Mayo Oyster Development Co-op Society Ltd	Mayo	Shellfish	302.6	297.2	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_1066	T06-372A	Paul Flannery	Kerry	Aquatic Plant, Echinoderm, Shellfish	302.8	298.4	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_1067	T06-374A	Brian McCarthy & Daniel O'Mahony	Kerry	Shellfish	303.3	300.3	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_1069	T10-028A	North Mayo Oyster Development Co-op Society Ltd	Mayo	Shellfish	304.8	299.3	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_1070	T10-296A	Dulra Iorrais Teoranta	Mayo	Aquatic Plant	305.0	299.3	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No
AQC_1071	T06-202	Silver King Seafoods Ltd	Kerry	Finfish	306.6	304.7	1	Ireland													No	Yes	Yes	Yes	Yes	e	No	g	No	e	No	g	No

Offshore Cumulative Effects Assessment Matrix - Shipping & Ports - Celtic Sea Region

Other Development Details							Phases of Other Developments in relation to the construction phase of the Proposed Development (denoted in red)														Stage 1				Stage 2							
ID	Feature	Area / Country	Distance to the Proposed Development Array Area (km)	Distance to the Proposed Development Cable Corridor and Working Area (km)	Tier	Region	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	ICES Celtic Sea 7a	ICES Celtic Sea	Within ZoI for at least one topic?	Progress to Stage 2?	Overlap in temporal scope?	Benthic Subtidal and Intertidal Ecology		Fish, Shellfish and Sea Turtle Ecology		Marine Mammals		Offshore Ornithology	
																										Potential LSE Criteria	Progress to Stage 3/4?	Potential LSE Criteria	Progress to Stage 3/4?	Potential LSE Criteria	Progress to Stage 3/4?	Potential LSE Criteria	Progress to Stage 3/4?
S&P_01	Port	Wicklow	9.7	9.0	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_02	Port	Arklow	11.5	4.0	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_03	Port	Dun Laoghaire	44.3	43.4	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_04	Port	Rosslare Euro Port (Rosslare Offshore Renewable Energy Hub)	52.2	51.6	3	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	c	Yes	c	Yes	e	No
S&P_05	Port	Rosslare Harbour	52.5	51.9	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_06	Port	Dublin	52.5	51.6	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_07	Port	Rosslare	52.9	52.3	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_08	Port	Howth	53.2	52.3	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_09	Port	New Ross	71.7	71.1	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_10	Traffic Separation Scheme Lanes	Off Skerries	84.7	83.7	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_11	Traffic Separation Zones	Off Skerries	85.7	84.7	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_12	Traffic Separation Scheme Lanes	Off Skerries	86.8	85.8	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_13	Port	Waterford	88.8	88.2	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_14	Traffic Separation Scheme Lanes	Off Smalls	89.2	88.6	1	Wales															No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_15	Traffic Separation Zones	Off Smalls	90.9	90.3	1	Wales															Yes	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_16	Traffic Separation Scheme Lanes	Off Smalls	92.4	91.7	1	Wales															Yes	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_17	Port	Drogheda	92.8	91.9	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_18	Port	Holyhead	96.1	95.2	1	Wales															Yes	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_19	Port	Fishguard	99.1	98.4	1	Wales															Yes	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_20	Port	Pwllheli	99.8	99.2	1	Wales															Yes	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_21	Traffic Separation Scheme Lanes	Off Skerries	104.2	103.2	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_22	Traffic Separation Scheme Lanes	Off Skerries	105.2	104.2	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_23	Areas to be Avoided	Between the Smalls Lighthouse and Grassholme Island	105.7	105.0	1	Wales															Yes	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_24	Port	Menai Bridge	121.0	120.2	1	Wales															Yes	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_25	Port	Bangor	123.5	122.6	1	Wales															Yes	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_26	Port	Milford Docks	124.7	124.0	1	Wales															No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_27	Port	Port Penrhyn	124.8	124.0	1	Wales															No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_28	Port	Greenore	124.9	123.9	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_29	Port	Dundalk	125.0	124.0	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_30	Port	Milford Haven	125.0	124.3	1	Wales															No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_31	Port	Beaumaris	126.7	125.9	1	wales															Yes	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_32	Port	Pembroke Dock	129.0	128.3	1	Wales															No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_33	Port	Warrenpoint	133.0	132.1	1	Northern Ireland															No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_34	Port	Youghal	149.6	149.1	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_35	Port	Llandulas	157.3	156.5	1	Wales															No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_36	Traffic Separation Scheme Lanes	In Liverpool Bay	161.3	160.4	1	England															No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_37	Traffic Separation Zones	In Liverpool Bay	162.5	161.6	1	England															No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_38	Traffic Separation Scheme Lanes	In Liverpool Bay	163.3	162.4	1	England															No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_39	Port	Peel, Isle of Man	166.2	165.2	1	Isle of Man															No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_40	Port	Llanelli	166.3	165.6	1	Wales															No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_41	Port	Douglas, Isle of Man	167.0	166.0	1	Isle of Man															No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_42	Port	Rhyl	167.7	166.9	1	Wales															No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_43	Areas to be Avoided	In Liverpool Bay	168.5	167.6	1	England															No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_44	Traffic Separation Zones	In Liverpool Bay	170.2	169.3	1	England															No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_45	Port	Liverpool	171.2	170.3	1	England															No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_46	Port	Limerick	177.8	170.4	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_47	Port	Whitegate	179.3	178.7	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_48	Port	Cobh	181.2	180.6	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_49	Port	Mostyn	182.1	181.2	1	Wales															No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_50	Port	Haulbowline	182.2	181.7	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_51	Port	Swansea	182.4	181.7	1	Wales															No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_52	Port	Rushbrooke	183.2	182.6	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_53	Port	Passage West	183.2	182.7	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_54	Port	Ringaskiddy	184.2	183.6	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_55	Port	Neath	185.4	184.8	1	Wales															No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_56	Port	Briton Ferry	187.1	186.5	1	Wales															No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_57	Port	Coaltainers, Belfast	187.2	186.3	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No

S&P_58	Port	Tivoli	187.4	186.9	1	Ireland														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_59	Port	Cork	187.4	186.9	1	Ireland														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_60	Port	Port Talbot	190.7	190.0	1	Wales														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_61	Port	Belfast	191.5	190.6	1	Northern Ireland														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_62	Port	Birkenhead	200.1	199.3	1	England														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_63	Port	Tranmere	200.3	199.5	1	England														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_64	Port	Carrickfergus	200.4	199.5	1	Ireland														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_65	Port	Kilroot Power Station Jetty	200.9	200.0	1	Ireland														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_66	Port	Bromborough	201.0	200.2	1	England														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_67	Port	Eastham	201.8	201.0	1	England														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_68	Port	Seaforth	202.1	201.3	1	England														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_69	Port	KILROOT	202.6	201.7	1	Northern Ireland														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_70	Port	Ellesmere Port	203.1	202.3	1	England														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_71	Port	Kinsale	203.7	203.2	1	Ireland														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_72	Port	Garston	206.0	205.1	1	England														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_73	Port	Stanlow	207.1	206.3	1	England														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_74	Port	Aughinish Island	207.4	200.1	1	Ireland														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_75	Port	Ince	208.2	207.4	1	England														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_76	Port	FOYNES	211.4	204.3	1	Ireland														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_77	Port	Galway	211.9	202.4	1	Ireland														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_78	Port	Larne Bank Quays	215.2	214.3	1	Northern Ireland														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_79	Port	Weston Point	215.2	214.4	1	England														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_80	Port	Larne	215.4	214.5	1	Northern Ireland														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_81	Port	Cloghan	216.2	215.3	1	Northern Ireland														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_82	Port	Runcorn	216.5	215.7	1	England														Yes	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_83	Port	Appledore	218.5	217.8	1	England														Yes	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_84	Port	Barrow-In-Furness	220.6	219.6	1	England														Yes	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_85	Port	Bideford	220.8	220.0	1	England														Yes	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_86	Port	Fleetwood	222.5	221.6	1	England														Yes	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_87	Port	Sligo	226.2	224.4	1	Ireland														Yes	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_88	Port	Millom	226.8	225.8	1	England														Yes	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_89	Port	Moneypoint	231.0	223.8	1	Ireland														Yes	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_90	Port	HEYSHAM	233.8	232.8	1	England														Yes	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_91	Port	Barry	233.9	233.2	1	Wales														Yes	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_92	Port	Cardiff	235.5	234.8	1	Wales														Yes	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_93	Port	Glasson Dock	235.6	234.7	1	England														Yes	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_94	Port	Penarth	235.7	235.1	1	Wales														Yes	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_95	Port	Whitehaven	237.3	236.3	1	England														Yes	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_96	Port	KILRUSH	237.3	229.8	1	Ireland														Yes	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_97	Port	Newport, Gwent	238.3	237.6	1	Wales														Yes	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_98	Port	Bellport	239.5	238.8	1	England														Yes	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_99	Port	Red Bay	241.0	240.1	1	Northern Ireland														Yes	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_100	Port	Lancaster	241.1	240.2	1	England														Yes	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_101	Port	Watchet	246.2	245.5	1	England														Yes	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_102	Port	Kirkcudbright	246.2	245.3	1	England														Yes	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_103	Port	Workington	246.7	245.7	1	England														Yes	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_104	Port	Padstow	247.8	247.2	1	England														Yes	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_105	Port	LONDONDERRY	248.9	248.0	1	Northern Ireland														Yes	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_106	Port	Coleraine	251.4	250.5	1	Northern Ireland														Yes	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_107	Port	Killybegs	252.5	251.7	1	Ireland														Yes	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_108	Port	Chepstow	253.6	253.0	1	Wales														Yes	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_109	Port	Maryport	255.0	254.0	1	England														Yes	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_110	Port	Portishead	256.1	255.4	1	England														Yes	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_111	Traffic Separation Scheme Lanes	In the North Channel	257.0	256.1	1	Northern Ireland and Scotland														Yes	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_112	Port	Portbury	257.5	256.9	1	England														Yes	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_113	Port	Tralee	257.9	253.1	1	Ireland														Yes	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_114	Port	Avonmouth	258.1	257.4	1	England														Yes	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_115	Traffic Separation Zones	In the North Channel	259.1	258.2	1	Northern Ireland and Scotland														Yes	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_116	Port	Bantry harbour	260.1	259.6	1	Ireland														Yes	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_117	Traffic Separation Zones	Off Land's End, Between Seven Stones and Longships	260.4	259.9	1	England														Yes	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_118	Traffic Separation Scheme Lanes	Off Land's End, Between Seven Stones and Longships	260.5	260.0	1	England														Yes	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_119	Traffic Separation Zones	Off Land's End, Between Seven Stones and Longships	260.5	259.9	1	England														Yes	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_120	Traffic Separation Scheme Lanes	South of the Scilly Isles	260.5	335.7	1	England														Yes	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_121	Traffic Separation Zones	South of the Scilly Isles	260.5	332.0	1	England														Yes	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_122	Traffic Separation Scheme Lanes	Off Land's End, Between Seven Stones and Longships	260.6	260.0	1	England														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No

S&P_123	Traffic Separation Scheme Lanes	In the North Channel	261.2	260.3	1	Northern Ireland and Scotland														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_124	Port	Bantry Bay	261.5	260.9	1	Ireland														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_125	Port	Bridgwater	264.4	263.7	1	England														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_126	Port	Bristol	266.5	265.9	1	England														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_127	Port	Fenit	266.6	261.7	1	Ireland														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_128	Traffic Separation Scheme Lanes	In the North Channel	269.3	268.4	1	Northern Ireland and Scotland														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_129	Port	Silloth	272.4	271.4	1	England														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_130	Port	Par	273.8	273.1	1	England														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_131	Traffic Separation Scheme Lanes	In the North Channel	275.7	274.8	1	Northern Ireland and Scotland														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_132	Port	Exeter	275.8	275.1	1	England														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_133	Port	Fowey	276.2	275.5	1	England														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_134	Port	Truro	277.4	276.7	1	England														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_135	Inshore Traffic Zones	Off Land's End, Between Seven Stones and Longships	279.1	278.5	1	England														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_136	Port	Hayle	279.5	278.8	1	England														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_137	Port	Topsham	280.9	280.2	1	England														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_138	Inshore Traffic Zones	Isles of Scilly	282.9	282.3	1	England														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_139	Port	Millbay Docks	286.0	285.3	1	England														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_140	Port	Penzance	286.3	285.6	1	England														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_141	Port	Sutton Harbour	286.6	285.9	1	England														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_142	Port	Plymouth	286.8	286.1	1	England														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_143	Port	Cattewater Harbour	287.0	286.3	1	England														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_144	Port	Falmouth	287.5	286.8	1	England														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_145	Port	Newlyn	287.9	287.3	1	England														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_146	Port	Castletown Bere	290.9	290.1	1	Ireland														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_147	Port	Teignmouth	292.0	291.2	1	England														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_148	Traffic Separation Zones	West of the Scilly Isles	295.9	295.4	1	England														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_149	Traffic Separation Scheme Lanes	West of the Scilly Isles	296.1	295.6	1	England														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_150	Traffic Separation Zones	West of the Scilly Isles	296.6	296.1	1	England														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_151	Traffic Separation Scheme Lanes	West of the Scilly Isles	297.0	296.5	1	England														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_152	Port	Porthoustock England	298.0	297.3	1	England														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_153	Port	Brixham	305.3	304.6	1	England														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_154	Traffic Separation Zones	South of the Scilly Isles	324.2	323.7	1	England														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_155	Traffic Separation Scheme Lanes	South of the Scilly Isles	327.0	326.5	1	England														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_156	Port	Weymouth	335.0	334.3	1	England														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_157	Traffic Separation Zones	Off Casquets	358.3	357.6	1	England														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_158	Traffic Separation Scheme Lanes	Off Casquets	361.8	361.1	1	England														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_159	Traffic Separation Zones	Off Casquets	370.6	369.8	1	England														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_160	Traffic Separation Scheme Lanes	Off Casquets	379.3	378.6	1	England														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_161	Traffic Separation Scheme Lanes	Off Casquets	390.7	389.9	1	England														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_162	Traffic Separation Zones	Off Casquets	390.7	389.9	1	England														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_163	Deep Water Route Part	Deep Water route west of the Hebrides	450.9	450.0	1	Scotland														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_164	Traffic Separation Scheme Lanes	Off Neist Point in The Minches	501.7	500.8	1	Scotland														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_165	Traffic Separation Scheme Lanes	Off Neist Point in The Minches	501.7	500.8	1	Scotland														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_166	Traffic Separation Zones	Off Neist Point in The Minches	502.3	501.4	1	Scotland														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_167	Traffic Separation Scheme Lanes	Off Neist Point in The Minches	505.5	504.6	1	Scotland														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_168	Traffic Separation Scheme Lanes	Off Neist Point in The Minches	507.2	506.3	1	Scotland														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_169	Deep Water Route Part	Deep Water route west of the Hebrides	539.7	538.8	1	Scotland														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_170	Deep Water Route Part	Deep Water route west of the Hebrides	610.1	609.2	1	Scotland														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_171	Areas to be Avoided	In the Region of the Orkney Islands	672.8	671.9	1	Scotland														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_172	Areas to be Avoided	Area to be avoided 2 - In the region of the Shetland Islands	805.2	804.2	1	Scotland														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_173	Precautionary Areas	Precautionary area 3 - In the region of the Shetland Islands	807.3	806.3	1	Scotland														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_174	Precautionary Areas	Precautionary area 1 - In the region of the Shetland Islands	897.1	896.2	1	Scotland														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_175	Areas to be Avoided	Area to be avoided 2 - In the region of the Shetland Islands	902.0	901.1	1	Scotland														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No

S&P_176	Areas to be Avoided	Area to be avoided 1 - In the region of the Shetland Islands	904.3	903.3	1	Scotland														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_177	Areas to be Avoided	Area to be avoided 1 - In the region of the Shetland Islands	904.3	903.3	1	Scotland														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No
S&P_178	Areas to be Avoided	Area to be avoided 1 - In the region of the Shetland Islands	908.9	908.0	1	Scotland														No	Yes	Yes	Yes	Yes	e	No	e	No	e	No	e	No

Offshore Cumulative Effects Assessment Matrix - Coastal Assets - Celtic Sea Region

Other Development Details									Phases of Other Developments in relation to the construction phase of the Proposed Development (denoted in red)														Stage 1				Stage 2							
ID	Project	Developer / Applicant	Licence	Status	Distance to the Proposed Development Array Area (km)	Distance to the Proposed Development Cable corridor and Working Area (km	Tier	Region	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	ICES Celtic Sea 7a	ICES Celtic Sea	Within ZoI for at least one topic?	Progress to Stage 2?	Overlap in temporal scope?	Benthic Subtidal and Intertidal Ecology		Fish, Shellfish and Sea Turtle Ecology		Marine Mammals		Offshore Ornithology	
																												Potential LSE Criteria	Progress to Stage 3/4?	Potential LSE Criteria	Progress to Stage 3/4?	Potential LSE Criteria	Progress to Stage 3/4?	Potential LSE Criteria	Progress to Stage 3/4?
CA_01	Arklow OGI: Proposed development will comprise of onshore grid infrastructure including 220kV export cable circuits and fibre optic cables, new 220kV GIS substation at Shelton Abbey and overhead line connection and all associated ancillary works.	Sure Partners limited	VA27.310090	Approved	10.2	0	1	Ireland															Yes	Yes	Yes	Yes	Yes	d	No	g	No	g	No	g	No
CA_02	Irish Water Connection	Sure Partners limited/Irish water	VA27.310090	No specific planning record found since 2023. Treat as anticipated supporting works.	10.2	3.4	3	Ireland															Yes	Yes	Yes	Yes	Yes	g	No	g	No	g	No	g	No
CA_03	Arklow Waste Water Treatment Plant	Irish Water	FS006862	Approved	10.8	3.4	1	Ireland															Yes	Yes	Yes	Yes	Yes	c	Yes	g	No	g	No	g	No
CA_04	Dredging at Arklow Harbour	Wicklow County Council	FS005762	Application submitted	11.4	3.9	3	Ireland															Yes	Yes	Yes	Yes	No	f	No	g	No	g	No	g	No
CA_05	Flood relief scheme Arklow	Wicklow County Council	Reference: YA27.310368.	Approved	11.5	4.0	1	Ireland															Yes	Yes	Yes	Yes	Yes	g	No	g	No	g	No	g	No
CA_06	Arklow Bank Wind Park 2 Operations and Maintenance Facility Onshore and Nearshore infrastructure and associated works	Sure Partners Limited	Reference: 21/1316.	Approved	11.9	4.3	1	Ireland															Yes	Yes	Yes	Yes	Yes	c	Yes	g	No	g	No	g	No
CA_07	Permission to Reconnect Wicklow Town Centre and South Quay	Wicklow County Council	Reference: 221133	Approved	9.9	9.1	1	Ireland															Yes	Yes	Yes	Yes	No	g	No	g	No	g	No	g	No
CA_08	Permission for installation of floating pontoon Wicklow town	Wicklow County Council	Reference: 20471	Approved	9.1	9.9	1	Ireland															Yes	Yes	Yes	Yes	No	d	No	g	No	g	No	g	No
CA_09	Eirgrid Upgrade works, Grid upgrade works including a new 220 kV substation at Ballybeg and the stringing of new conductors on the currently unused side of 220 kV pylons between the proposed Arklow Bank Wind Park 2 OGI substation and the existing Arklow 220 kV substation	EIRGRID	CP1196 / CP1238	Approved	13.6	12.5	1	Ireland															Yes	Yes	Yes	Yes	Yes	g	No	g	No	g	No	g	No
CA_10	Arklow Sewerage Scheme - South Quay Wall	Irish Water	FS006715	Approved	27.7	23.0	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	g	No	g	No
CA_11	Coast Guard Station Wicklow	The Commissioners of Public Works in Ireland	Reference: 2035	Approved	27.3	26.4	1	Ireland															Yes	Yes	Yes	Yes	No	e	No	g	No	g	No	g	No
CA_12	Permission for alteration to Plan for integrated harbour / marina mixed development	Wicklow County Council	Reference: 18371 (previous ref: 17664)	Ended	28.1	27.1	3	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	g	No	g	No
CA_13	Process for the Bray Sustainable Transport Bridge Project	Wicklow County Council	Reference: 21869	Approved	34.3	33.4	1	Ireland															Yes	Yes	Yes	Yes	No	e	No	g	No	g	No	g	No
CA_14	EXTENSION OF APPROPRIATE PERIOD	Shankill Property Investments Limited	Reference: 20672	Validated	34.4	33.5	3	Ireland															Yes	Yes	Yes	Yes	No	e	No	g	No	g	No	g	No
CA_15	Dun Laoghaire Rathdown County Council - Corbawn Lawn	Dun Laoghaire Rathdown County Council - Corbawn Lawn	FS006826	Completed	37.5	36.6	1	Ireland															Yes	Yes	Yes	Yes	No	e	No	g	No	g	No	g	No
CA_16	Shanganagh Waste Water Treatment Plant	Dun Laoghaire-Rathdown County Council	D0038-01	Operational	38.3	37.4	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	g	No	g	No
CA_17	Development & refurbishment & internal alterations to dwelling	Sorrento HGT Unlimited Company	Reference: D22A/0566	Permission granted and refused	40.6	39.6	1	Ireland															Yes	Yes	Yes	Yes	No	e	No	g	No	g	No	g	No
CA_18	Dun Laoghaire Rathdown Co.Co. - Dalkey Island	Dun Laoghaire Rathdown Co.Co. - Dalkey Island	FS006077	Approved	40.9	39.9	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	g	No	g	No
CA_19	Development at Howth Fishery Harbour Centre	Minister for Agriculture, Food and the Marine	F21A/0368	Application submitted	42.3	41.4	3	Ireland															Yes	Yes	Yes	Yes	No	e	No	g	No	g	No	g	No
CA_20	Irish Water - Dun Laoghaire	Irish Water	FS006543	Application submitted	43.4	42.5	3	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	g	No	g	No
CA_21	Dun Laoghaire Rathdown Co Co - Baths	Dun Laoghaire Rathdown Co Co - Baths	FS005832	Approved	43.5	42.6	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	g	No	g	No
CA_22	River Slaney (Enniscorthy) Drainage Scheme	Commissioners of Public Works	DPE063-015-2020	Application submitted	43.2	42.6	3	Ireland															Yes	Yes	Yes	Yes	No	e	No	g	No	g	No	g	No
CA_23	Development and extension and associated site woks at the National Yacht Club	The National Yacht Club	Reference: D22A/0758	Approved	43.8	42.9	1	Ireland															Yes	Yes	Yes	Yes	No	e	No	g	No	g	No	g	No
CA_24	Permission for Retention of a steel mesh fence and associated structural posts	Dun Laoghaire Harbour Company	Reference: D18A/0206	Approved	43.9	43.0	1	Ireland															Yes	Yes	Yes	Yes	No	e	No	g	No	g	No	g	No

CA_25	Urban Beach and Floating Pool Facility at Dun Laoghaire	Dun Laoghaire Harbour Company	Reference: D13A/0682	On hold	43.9	43.0	2	Ireland															Yes	Yes	Yes	Yes	No	e	No	g	No	g	No	g	No
CA_26	Dun Laoghaire Harbour Company	Dun Laoghaire Harbour Company	FS006786	Approved	44.2	43.2	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	g	No	g	No
CA_27	Stena Line Linkspan removal	Stena Line	FS006557	Approved	44.2	43.3	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	g	No	g	No
CA_28	Dun Laoghaire Harbour East Pier Revetment Repair Works	Dún Laoghaire-Rathdown County Council	DLH-003-23	Approved	44.4	43.5	1	Ireland															Yes	Yes	Yes	Yes	No	e	No	g	No	g	No	g	No
CA_29	Dun Laoghaire Harbour Company	Dun Laoghaire Harbour Company	FS006713	Application submitted	44.5	43.6	3	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	g	No	g	No
CA_30	Permission for Retention	POD Marine Ltd	Reference: D18A/1123	Approved	44.6	43.7	1	Ireland															Yes	Yes	Yes	Yes	No	e	No	g	No	g	No	g	No
CA_31	Permission for Retention	Brendan Farrell	Reference: D11A/0301	Approved	44.6	43.7	1	Ireland															Yes	Yes	Yes	Yes	No	e	No	g	No	g	No	g	No
CA_32	Dublin Port maintenance dredging	Dublin Port Company	FS007132	Ended but recurring maintenance activity	45.6	44.7	1	Ireland															Yes	Yes	Yes	Yes	No	e	No	g	No	g	No	g	No
CA_33	Dublin Port Masterplan (3FM Plan)	Dublin Port Company	FS 006893	Licence valid	47.0	46.1	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	g	No	g	No
CA_34	Techworks Marine Monitoring Buoys	Techworks Marine	FS006758	Approved	47.1	46.1	1	Ireland															Yes	Yes	Yes	Yes	No	e	No	g	No	g	No	g	No
CA_35	Alexandra Basin Redevelopment Project	Dublin Port Company	FS005699	Ended	48.2	47.3	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	g	No	g	No
CA_36	Construction/ installation of an OCGT generating unit and associated plant and equipment	ESB	ABP-314365-22	Application submitted	49.8	48.9	3	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	g	No	g	No
CA_37	Greater Dublin Area Agglomeration Wastewater Discharge	Uisce Éireann	D0034-02	Application submitted	49.9	49.0	3	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	g	No	g	No
CA_38	Dublin Port Masterplan (MP2 Plan)	Dublin Port Company	FLA: FS006893 Reference: ABP-304888-19	Application submitted	50.0	49.0	3	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	g	No	g	No
CA_39	Dublin Port Company MP2 Project	Dublin Port Company	FS006893	Application submitted	50.0	49.1	3	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	g	No	g	No
CA_40	Ringsend Wastewater Treatment Works Extension	Irish Water	D0034-01	Approved	50.1	49.2	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	g	No	g	No
CA_41	Permission for Construction and development adjacent to Pigeon House Road	Dublin Port Company	Reference: 3711/18	Licence valid	50.4	49.5	1	Ireland															Yes	Yes	Yes	Yes	No	e	No	g	No	g	No	g	No
CA_42	Dublin Port maintenance dredging	Dublin Port Company	FS007132	Approved	48.9	49.8	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	g	No	g	No
CA_43	New pontoon at Berth 50 for Tug boats	Dublin Port Company	FS006806	Approved	51.1	50.2	1	Ireland															Yes	Yes	Yes	Yes	No	e	No	g	No	g	No	g	No
CA_44	Temporary emergency electricity generating plan within the existing North Wall Power Generating Station	Minister of the Environment, Climate and Communications	ABP-313918	Application submitted	51.4	50.5	3	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	g	No	g	No
CA_45	North Wall Emergency Power Generation Plant	ESB	ABP-313918-22	Licence valid	51.4	50.5	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	g	No	g	No
CA_46	Ravensburg Ltd	Ravensburg Ltd	FS006433	Approved	52.0	51.1	1	Ireland															Yes	Yes	Yes	Yes	No	e	No	g	No	g	No	g	No
CA_47	Various Sites along Bond Drive Extension, Dublin Port, Dublin 3	Minister for Public Expenditure and Reform	ABP-307352-20	Application submitted	52.1	51.2	3	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	g	No	g	No
CA_48	Foreshore licence application for the Installation of a 200mm welded steel pipeline under the Tolka River using trenchless techniques. The pipeline will be used to transport aviation fuel from Dublin Port to Dublin airport.	Ireland	FS005704	Approved	52.9	52.0	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	g	No	g	No
CA_49	Dublin City Council - Cycleway	Dublin City Council	FS006503	Application submitted	53.0	52.0	3	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	g	No	g	No
CA_50	Gas pipeline trenchless crossing	Bord Gais	FS006104	Approved	53.0	52.1	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	g	No	g	No
CA_51	RNLI Lifeboat Station Pontoon construction	RNLI	Reference: F15A/0512	Approved	53.2	52.3	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	g	No	g	No
CA_52	Extension of marine facilities Howth	Howth Yacht Club	Reference: F10A/0353/E1	Approved	53.4	52.4	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	g	No	g	No
CA_53	Middle Pier development Howth	Mins. for Agri., Food & the Marine	Reference: F19A/0296	Approved	53.7	52.7	1	Ireland															Yes	Yes	Yes	Yes	No	e	No	g	No	g	No	g	No
CA_54	The Trawler Basin	Minister for Agr., Food & Marine	Reference: F16A/0063	Approved	52.7	53.6	1	Ireland															Yes	Yes	Yes	Yes	No	e	No	g	No	g	No	g	No
CA_55	Irish Water Bentic Survey	Irish Water	FS007605	Licence valid	55.7	54.8	1	Ireland															Yes	Yes	Yes	Yes	No	e	No	g	No	g	No	g	No
CA_56	Greater Dublin Drainage Sea Outfall Pipe	Irish Water	FS 006843	Licence valid	55.8	54.8	1	Ireland															Yes	Yes	Yes	Yes	No	e	No	g	No	g	No	g	No
CA_57	Repairs on Rock armour at Portmarnock Golf Club	The Trustees of Portmarnock Golf Club	F21A/0566	Completed	55.8	54.9	1	Ireland															Yes	Yes	Yes	Yes	No	e	No	g	No	g	No	g	No
CA_58	Coastal asset/infra	The Trustees of Portmarnock Golf Club	Reference: F21A/0566	Approved	55.8	54.9	1	Ireland															Yes	Yes	Yes	Yes	No	e	No	g	No	g	No	g	No
CA_59	Maintenance and repair of rock armour revetment	The Trustees of Portmarnock Golf Club	Reference: F23A/0215	Approved	55.8	54.9	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	g	No	g	No
CA_60	Fingal County Council	Fingal County Council	FS006845	Completed	57.2	56.3	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	g	No	g	No
CA_61	Permission of erection of fence	Alistair Thompson	Reference: 1950899	Ended	58.8	58.3	1	Ireland															No	Yes	Yes	Yes	No	e	No	g	No	g	No	g	No
CA_62	Permission for the construction in Malahide Marina Village	View Office Space Limited	Reference: F22A/0026	Approved	61.5	60.6	1	Ireland															Yes	Yes	Yes	Yes	No	e	No	g	No	g	No	g	No
CA_63	Change of use from restaurant to office in Malahide Marina Village	View Office Space Ltd.	Reference: F19A/0219	Approved	61.5	60.6	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	g	No	g	No	g	No

CA_64	Malahide Marina Village Ltd	Malahide Marina Village Ltd	FS006731	Approved	61.7	60.8	1	Ireland														Yes	Yes	Yes	Yes	No	e	No	g	No	g	No	g	No
CA_65	Carnsore Wind Farm Project	Hibernian wind power ltd	Application No.: 20211222	Application submitted	61.5	61.0	3	Ireland														Yes	Yes	Yes	Yes	Yes	e	No	g	No	g	No	g	No
CA_66	Irish Water - Swords	Irish Water	FS005738	Approved	63.7	62.8	1	Ireland														Yes	Yes	Yes	Yes	Yes		No	g	No	g	No	g	No
CA_67	Broadmeadow Way	Fingal County Council	ABP-304624-19	Application submitted	63.7	62.8	3	Ireland														Yes	Yes	Yes	Yes	No	e	No	g	No	g	No	g	No
CA_68	Reinstatement and repair of the current rock armour weir under UBB36 bridge back	ByrneLooby Partners (Irl)	Reference: F23A/0451	Application submitted	66.5	65.6	3	Ireland														Yes	Yes	Yes	Yes	No	e	No	g	No	g	No	g	No
CA_69	Construction of a new disability access landing pontoon	Rush Sailing Club	Reference: F21A/0239 (Fingal County council - Approved in 2021) FS006984 (foreshore licence)	Consultation	67.1	66.2	1	Ireland														Yes	Yes	Yes	Yes	No	e	No	g	No	g	No	g	No
CA_70	Irish Water - Lusk	Irish Water	FS005745	Approved	67.4	66.5	1	Ireland														Yes	Yes	Yes	Yes	No	e	No	g	No	g	No	g	No
CA_71	Permission for the continuation of sand and gravel extraction and processing from an existing registered quarry (ref: Q11)	Inish Pebble Company Ltd		Licence valid	68.0	67.5	1	Ireland														Yes	Yes	Yes	Yes	Yes	e	No	g	No	g	No	g	No
CA_72	Port of Waterford – Offshore Renewable Energy Capable Terminal (Belview)	Port of Waterford	OA10.323575	Planning application submitted	88.8	88.2	3	Ireland														Yes	Yes	Yes	Yes	Yes	e	No	g	No	c	Yes	g	No
CA_73	Irish Water -Loughshinny	Irish Water	FS005749	Completed	70.7	69.8	1	Ireland														Yes	Yes	Yes	Yes	Yes	e	No	g	No	g	No	g	No
CA_74	Permission for Extension	Brian Hennessey	Reference: 221068	Licence valid	86.6	86.0	1	Ireland														Yes	Yes	Yes	Yes	Yes	e	No	g	No	g	No	g	No
CA_75	Rock armour Laytown Beach, Ninch	Meath County Council	FS006602	Approved	87.2	86.3	1	Ireland														Yes	Yes	Yes	Yes	Yes	e	No	g	No	g	No	g	No
CA_76	Waterford City Public Infrastructure Project- Flood Defences West	Waterford City and County Council	ABP-311746-21	Application submitted	88.8	88.2	3	Ireland														Yes	Yes	Yes	Yes	Yes	e	No	g	No	g	No	g	No
CA_77	RIVER SUIR SUSTAINABLE TRANSPORT BRIDGE	Waterford City & County Council	ABP-303274-18	Application submitted	89.0	88.4	3	Ireland														Yes	Yes	Yes	Yes	Yes	e	No	g	No	g	No	g	No
CA_78	Maintenance dredging River Boyne, Dogheda	Drogheda Port Company Dredging of River Boyne	FS007028	Approved	91.5	90.6	1	Ireland														Yes	Yes	Yes	Yes	Yes	e	No	g	No	g	No	g	No
CA_79	Maintenance dredging River Boyne, Dogheda	Drogheda Port Company	FS005747	Approved	91.8	90.9	1	Ireland														Yes	Yes	Yes	Yes	Yes	e	No	g	No	g	No	g	No
CA_80	Outfall and works at South Bank River Boyne, Drogheda	Talebury Holdings	FS005255	Consultation	92.8	91.9	3	Ireland														Yes	Yes	Yes	Yes	No	e	No	g	No	g	No	g	No
CA_81	Greenlink Interconnector	Greenlink Interconnector limited	FS007050	Licence valid	96.4	95.8	1	Ireland														Yes	Yes	Yes	Yes	Yes	e	No	g	No	g	No	g	No
CA_82	Coastal protection works Annagassan	Louth County Council	FS006560	Approved	109.7	108.8	1	Ireland														Yes	Yes	Yes	Yes	Yes	e	No	g	No	g	No	g	No
CA_83	Maintenance dredging at Soldiers Point, Dundalk Harbour	O'Hanlon and Sons Ltd	FS006425	Approved	124.4	123.5	1	Ireland														Yes	Yes	Yes	Yes	Yes	e	No	g	No	g	No	g	No
CA_84	Development at Greenore Port	Greenore Port	FS006748	Approved	124.9	124.0	1	Ireland														Yes	Yes	Yes	Yes	Yes	e	No	g	No	g	No	g	No
CA_85	Slipway construction at Greenore Port	Frazer Ferries Ltd	FS005705	Application submitted	124.9	124.0	3	Ireland														Yes	Yes	Yes	Yes	Yes	e	No	g	No	g	No	g	No
CA_86	Capital dredging at Greenore Port	Greenore Port	FS006676	Application submitted	124.9	124.0	3	Ireland														Yes	Yes	Yes	Yes	Yes	e	No	g	No	g	No	g	No
CA_87	Permission for refurbishment of existing slipway	Department of Agriculture, Food and the Marine	Reference: 18547	Ended	127.4	126.9	1	Ireland														No	Yes	Yes	Yes	No	e	No	g	No	g	No	g	No
CA_88	Greenway from Omeath Pier to the County Bridge	LLC	Reference: 20504	Approved	128.3	127.3	1	Ireland														Yes	Yes	Yes	Yes	No	e	No	g	No	g	No	g	No
CA_89	Omeath Sewerage Scheme	Irish Water	FS006575	Application submitted	131.8	130.9	3	Ireland														Yes	Yes	Yes	Yes	Yes	e	No	g	No	g	No	g	No
CA_90	Installation of a pontoon & anchorage system in the River Boyne	Drogheda Borough Council	Reference: 14207	Approved	146.9	146.1	1	Ireland														Yes	Yes	Yes	Yes	No	e	No	g	No	g	No	g	No
CA_91	Review of a Waste Water Discharge Licence	Youghal Wastewater Treatment Plant Mudlands Youghal Co. Cork	D0139-03	Application submitted	150.4	149.8	3	Ireland														No	Yes	Yes	Yes	No	e	No	g	No	g	No	g	No
CA_92	Installation of the EirGrid Celtic Interconnector Electricity Cable	EirGrid PLC	Ref: FS006916	Licence valid	151.6	151.1	1	Ireland														Yes	Yes	Yes	Yes	Yes	e	No	g	No	g	No	g	No
CA_93	Permission for construction of sewage system at Ballycotton	Uisce Eireann - Irish Water	Reference: 214483	Approved	165.8	166.4	1	Ireland														No	Yes	Yes	Yes	No	e	No	g	No	g	No	g	No
CA_94	Permission for the construction of new cheese production facility	Dairygold Co-operative Society Ltd.	Reference: 167031	Approved	174.3	173.8	1	Ireland														No	Yes	Yes	Yes	Yes	e	No	g	No	g	No	g	No
CA_95	Strategic Infrastructure Development (Electricity Transmission Interconnector Development)	EirGrid PLC	ABP-310798-21	Approved	173.5	174.0	1	Ireland														No	Yes	Yes	Yes	Yes	e	No	g	No	g	No	g	No
CA_96	Fendering replacement at Carlisle Pier	Dun Laoghaire Rathdown County Council	FS007290	Application submitted	176.2	175.4	3	Ireland														Yes	Yes	Yes	Yes	Yes	e	No	g	No	g	No	g	No
CA_97	Permission for construction at Lower Aghada Tennis and Sailing Club	Lower Aghada Tennis and Sailing Club	Reference: 215729	Approved	177.6	177.1	1	Ireland														No	Yes	Yes	Yes	No	e	No	g	No	g	No	g	No
CA_98	Permission for development at a 10.22 hectares site within ESB Aghad a Generating Station	ESB	23/5104	Licence valid	179.0	178.4	1	Ireland														No	Yes	Yes	Yes	Yes	e	No	g	No	g	No	g	No
CA_99	Permission for demolition site infrastructure improvements, and utility upgrade works at the Belvelly Port Facility	Belvelly Marino Development Company DAC	Reference: 196783	Granted conditionally - appealed	182.6	182.1	2	Ireland														No	Yes	Yes	Yes	No	e	No	g	No	g	No	g	No
CA_100	Extension of construction of marina	Monkstown Bay Marina Company Ltd.	Reference: 154446	Approved	184.7	184.1	1	Ireland														No	Yes	Yes	Yes	No	e	No	g	No	g	No	g	No

CA_101	Permission for refurbishment works to existing coastal defence embankments	Shannon Airport Authority	Reference: 191006	Licence valid	198.1	190.5	1	Ireland															No	Yes	Yes	Yes	No	e	No	g	No	g	No	g	No
CA_102	Jetty extension	Shannon Foynes Port Company	FS006837	Approved	210.4	203.3	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	g	No	g	No
CA_103	Port capacity extension	Shannon Foynes Port Company	PL91 .301561	Approved	210.8	203.7	1	Ireland															No	Yes	Yes	Yes	No	e	No	g	No	g	No	g	No
CA_104	Permission to carry out development related to surfacewater drainage culvert	Clare County Council	Reference: 218003	Application submitted	235.7	227.1	3	Ireland															No	Yes	Yes	Yes	No	e	No	g	No	g	No	g	No
CA_105	Decommissioning of certain facilities within the Seven Heads Gas Field	PSE Seven Heads Limited	Consent Application No.1 253993-00-REP-16	Approved	228.9	228.3	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	g	No	g	No
CA_106	Permission to develop proposed works	Bád Chlós Ros a' Mhíl Teo	Reference: 201633	Licence valid	245.7	235.9	1	Ireland															No	Yes	Yes	Yes	No	e	No	g	No	g	No	g	No
CA_107	Permission for small craft harbour -Rossaveel	Minister of Agriculture, Food & the Marine	Reference: 21300	Licence valid	245.8	236.0	1	Ireland															No	Yes	Yes	Yes	No	e	No	g	No	g	No	g	No
CA_108	Killybegs Quay extension	Department of Agriculture, Food and the Marine	Reference: 17/51385	Approved	252.2	251.3	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	g	No	g	No
CA_109	Permission to develop Castle pumping station	Uisce Eireann- Irish Water	Reference: 21264	Approved	252.4	251.9	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	g	No	g	No
CA_110	Construction of a pedestrian bridge and associated works.	Westport House/Inishoo Management, Westport House Estate, Westport	MAC20230002	Approved	259.7	252.9	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	g	No	g	No
CA_111	Permission for rehabilitation and removal of sediment	Irish Water	Reference: 18100	Licence valid	258.6	254.7	1	Ireland															No	Yes	Yes	Yes	No	e	No	g	No	g	No	g	No
CA_112	Permission to construct a boat storage area	Mayo Sailing Club	Reference: 207	Licence valid	265.2	258.5	1	Ireland															No	Yes	Yes	Yes	No	e	No	g	No	g	No	g	No
CA_113	Permission for development of Inner Bantry Harbour	Port of Cork Company Limited	Reference: 16640	Approved	261.5	261.0	1	Ireland															No	Yes	Yes	Yes	No	e	No	g	No	g	No	g	No
CA_114	Permission for demolition of the existing three span bridge and construction of a new single span bridge	Iarnród Éireann	Reference: 181236	Approved	266.3	261.1	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	g	No	g	No
CA_115	Permission for installation of new diving boards	Fenit Development Association	Reference: 181176	Approved	267.2	262.2	1	Ireland															No	Yes	Yes	Yes	No	e	No	g	No	g	No	g	No
CA_116	Retention Permission for breakwater and coastal defence wall	Peter Casey	Reference: 2250538	Licence valid	264.2	263.2	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	g	No	g	No
CA_117	Retention Permission for slipway development works	Peter Casey	Reference: 1951651	Licence valid	264.2	263.3	1	Ireland															No	Yes	Yes	Yes	No	e	No	g	No	g	No	g	No
CA_118	Permission to install fencing and remove/replace sections	Gurteen Bay & Dog's Bay Conservation Group	Reference: 2260606	Licence valid	274.4	264.9	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	g	No	g	No
CA_119	Permission for erection of Wind Turbine	Paul & Francesca Doonan	Reference: 12623	Approved	272.4	271.8	1	Ireland															No	Yes	Yes	Yes	No	e	No	g	No	g	No	g	No
CA_120	Permission for wharf extension at Dinish Island	The Minister for Agriculture Food and the Marine	Reference: 17637	Operational	290.5	289.8	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	g	No	g	No
CA_121	Permission is sought for components to the Castletownbere Sewerage Scheme	Irish Water	Reference: 19813	Approved	291.6	290.8	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	g	No	g	No
CA_122	Permission for developmet of small craft harbour - AN DAINGEAN FISHERY HARBOUR CENTRE	DEPARTMENT OF AGRICULTURE, FOOD AND THE MARINE	Reference: 23871	Application submitted	297.4	292.9	3	Ireland															No	Yes	Yes	Yes	No	e	No	g	No	g	No	g	No
CA_123	Dursey Island Cable Car and visitor centre (cable car crosses HWM).	Cork County Council	Reference: YA04.305442	Approved	305.4	304.4	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	g	No	g	No	g	No
CA_124	Permission for construction of extension to production facility	Wyeth Nutritionals Ireland Ltd	Reference: 18915	Ended	325.3	318.7	1	Ireland															No	Yes	Yes	Yes	No	e	No	g	No	g	No	g	No

Offshore Cumulative Effects Assessment Matrix - Carbon Capture Storage - Celtic Sea Region

Other Development Details								Phases of Other Developments in relation to the construction phase of the Proposed Development (denoted in red)														Stage 1				Stage 2							
ID	Project	Developer / Applicant	Status	Distance to the Proposed Development Array (km)	Distance to the Proposed Development Cable Corridor and Working Area (km)	Tier	Region	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	ICES Celtic Sea 7a	ICES Celtic Sea	Within ZoI for at least one topic?	Progress to Stage 2?	Overlap in temporal scope?	Benthic Subtidal and Intertidal Ecology		Fish, Shellfish and Sea Turtle Ecology		Marine Mammals		Offshore Ornithology	
																											Potential LSE Criteria	Progress to Stage 3/4?	Potential LSE Criteria	Progress to Stage 3/4?	Potential LSE Criteria	Progress to Stage 3/4?	Potential LSE Criteria	Progress to Stage 3/4?
CCS_01	HyNet North West Industrial Cluster & Liverpool Bay CO_2 Storage (CS004A/B)	Eni UK / Liverpool Bay CCS Ltd	In Development	167.2	166.3	1	United Kingdom															Yes	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
CCS_03	Carbon Capture Storage Project (CS004A)	ENI UK Ltd	Development - Linked to HyNet Storage System	167.2	166.3	1	United Kingdom															No	Yes	Yes	Yes	No	e	No	e	No	g	No	g	No
CCS_04	Carbon Capture Storage Project (CS004B)	ENI UK Ltd	Development - Linked to HyNet Storage System	178.0	177.1	3	United Kingdom															No	Yes	Yes	Yes	No	e	No	e	No	g	No	g	No
CCS_05	EIS Area 1	dCarbonX	10 year NSTA Licence	180.4	179.4	2	United Kingdom															Yes	Yes	Yes	Yes	No	e	No	e	No	g	No	g	No
CCS_06	Carbon Capture Storage Project (CS010)	Spirit Energy Production UK Ltd	Licensed - appraisal stage	180.4	179.4	3	United Kingdom															No	Yes	Yes	Yes	No	e	No	e	No	g	No	g	No
CCS_07	CCS Cork Project	Ervia Gas Networks Ireland	In Planning	181.1	180.5	3	Ireland															No	Yes	Yes	Yes	No	e	No	e	No	f	No	g	No
CCS_02	Kinsale Head CO_2 Storage Concept	Gas Networks Ireland (Concept Study)	Concept	210.0	210.0	3	Ireland															No	Yes	Yes	Yes	No	e	No	e	No	f	No	g	No
CCS_08	Carbon Capture Storage Project (CS028)	Shell UK Ltd	Licensed - appraisal stage	402.3	401.4	3	United Kingdom															No	Yes	Yes	Yes	No	e	No	e	No	g	No	g	No
CCS_09	Carbon Capture Storage Project (CS017)	Perenco UK Ltd	Licensed - appraisal stage	437.8	437.0	1	United Kingdom															No	Yes	Yes	Yes	No	e	No	e	No	g	No	g	No
CCS_10	Carbon Capture Storage Project (CS018)	Perenco UK Ltd	Licensed - appraisal stage	468.0	467.2	1	United Kingdom															No	Yes	Yes	Yes	No	e	No	e	No	g	No	g	No
CCS_11	Carbon Capture Storage Project (CS001)	BP Exploration Operating Company Ltd	Appraisal and pre-construction surveys	468.0	467.2	1	United Kingdom															No	Yes	Yes	Yes	No	e	No	e	No	g	No	g	No
CCS_12	East Coast Cluster & Northern Endurance CO_2 Storage (CS001, CS006, CS007)	Northern Endurance Partnership (BP, Equinor, TotalEnergies)	Licensed - early appraisal	468.0	467.2	1	United Kingdom															No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
CCS_13	Carbon Capture Storage Project (CS008)	ENI UK Ltd	Licensed - appraisal stage	497.8	497.1	3	United Kingdom															No	Yes	Yes	Yes	No	e	No	e	No	g	No	g	No
CCS_14	Carbon Capture Storage Project (CS025)	BP Exploration Operating Company Ltd / Equinor	Licensed - early appraisal	480.5	479.6	3	United Kingdom															No	Yes	Yes	Yes	No	e	No	e	No	g	No	g	No
CCS_15	Carbon Capture Storage Project (CS020)	Neptune Energy CCS Ltd	Licensed - appraisal stage	501.4	500.5	3	United Kingdom															No	Yes	Yes	Yes	No	e	No	e	No	g	No	g	No
CCS_16	Carbon Capture Storage Project (CS006)	BP Exploration Operating Company Ltd	Licensed - early appraisal	503.1	502.2	1	United Kingdom															No	Yes	Yes	Yes	No	e	No	e	No	g	No	g	No
CCS_17	Carbon Capture Storage Project (CS023)	Chrysaor Production (UK) Ltd / BP Exploration	Pre-construction / consenting	520.1	519.4	1	United Kingdom															No	Yes	Yes	Yes	No	e	No	e	No	g	No	g	No
CCS_18	Carbon Capture Storage Project (CS024)	Chrysaor Production (UK) Ltd / BP Exploration	Pre-construction / consenting	523.2	522.4	1	United Kingdom															No	Yes	Yes	Yes	No	e	No	e	No	g	No	g	No
CCS_19	Carbon Capture Storage Project (CS009)	Perenco UK Ltd	Licensed - appraisal stage	523.4	522.7	3	United Kingdom															No	Yes	Yes	Yes	No	e	No	e	No	g	No	g	No
CCS_20	Carbon Capture Storage Project (CS007)	Carbon Capture Storage Project (CS007)***	Licensed - early appraisal	531.5	530.6	1	United Kingdom															No	Yes	Yes	Yes	No	e	No	e	No	g	No	g	No
CCS_21	Viking CCS Project (CS005)	Harbour Energy / Chrysaor Production (UK) Ltd	In Development	533.8	533.0	1	United Kingdom															No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No

CCS_22	Carbon Capture Storage Project (CS027)	Shell UK Ltd	Licensed - appraisal stage	559.6	558.9	3	United Kingdom															No	Yes	Yes	Yes	No	e	No	e	No	g	No	g	No
CCS_23	Carbon Capture Storage Project (CS022)	Neptune Energy CCS Ltd	Licensed - appraisal stage	560.6	559.7	3	United Kingdom															No	Yes	Yes	Yes	No	e	No	e	No	g	No	g	No
CCS_24	Carbon Capture Storage Project (CS026)	Shell UK Ltd	Licensed - appraisal stage	578.0	577.3	3	United Kingdom															No	Yes	Yes	Yes	No	e	No	e	No	g	No	g	No
CCS_25	Carbon Capture Storage Project (CS021)	Neptune Energy CCS Ltd	Licensed - appraisal stage	581.4	580.5	3	United Kingdom															No	Yes	Yes	Yes	No	e	No	e	No	g	No	g	No
CCS_26	Acorn CCS / Scottish Cluster (CS011, CS012, CS003)	Pale Blue Dot Energy (Storegga), Shell UK, Harbour Energy	In Development	655.8	654.8	1	United Kingdom															No	Yes	Yes	Yes	Yes	e	No	e	No	g	No	g	No
CCS_27	Carbon Capture Storage Project (CS003)	Pale Blue Dot Energy Ltd (Storegga)	Development Phase	655.8	654.8	1	United Kingdom															No	Yes	Yes	Yes	No	e	No	e	No	g	No	g	No
CCS_28	Carbon Capture Storage Project (CS011)	Shell UK Ltd	Development Phase	663.8	662.8	1	United Kingdom															No	Yes	Yes	Yes	No	e	No	e	No	g	No	g	No
CCS_29	Carbon Capture Storage Project (CS012)	Shell UK Ltd	Development Phase	713.5	712.5	1	United Kingdom															No	Yes	Yes	Yes	No	e	No	e	No	g	No	g	No
CCS_30	Carbon Capture Storage Project (CS013)	EnQuest CCS Ltd	Licensed - appraisal stage	1046.8	1045.8	3	United Kingdom															No	Yes	Yes	Yes	No	e	No	e	No	g	No	g	No
CCS_31	Carbon Capture Storage Project (CS014)	EnQuest CCS Ltd	Licensed - appraisal stage	1036.6	1035.7	3	United Kingdom															No	Yes	Yes	Yes	No	e	No	e	No	g	No	g	No

Offshore Cumulative Effects Assessment Matrix - Disposal - Celtic Sea Subsection 7a

Other Development Details								Phases of Other Developments in relation to the construction phase of the Proposed Development (denoted in red)												Stage 1				Benthic Subtidal and Intertidal Ecology		Fish, Shellfish and Sea Turtle Ecology		Marine Mammals		Offshore Ornithology	
ID	Area	Site Number	Status	Distance to the Proposed Development Array Area (km)	Distance to the Proposed Development Cable Corridor and Working Area (km)	Tier	Region	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	ICES Celtic Sea 7a	Within ZoI for at least one topic?	Progress to Stage 2?	Overlap in temporal scope?	Potential LSE Criteria	Progress to Stage 3/4?	Potential LSE Criteria	Progress to Stage 3/4?	Potential LSE Criteria	Progress to Stage 3/4?	Potential LSE Criteria	Progress to Stage 3/4?
DISP_01	HOLYHEAD DEEP	IS040	Closed	82.3	81.3	**1**	Wales															Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_02	HOLYHEAD SOUTH	IS041	Closed	82.3	81.3	1	Wales															Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_03	Holyhead North	IS043	Open	85.6	84.7	1	Wales															Yes	Yes	Yes	Yes	e	No	e	No	e	No	g	No
DISP_04	HOLHEAD EAST	IS042	Closed	86.2	85.3	1	Wales															Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_05	FISHGUARD	IS010	Closed	98.1	97.4	1	Wales															Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_06	TREMADOC BAY	IS020	Closed	104.2	103.6	1	Wales															Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_07	MENAI STRAIT	IS030	Closed	110.6	109.8	1	Wales															Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_08	WARRENPOINT B	IS671	Open	115.9	115.0	1	Northern Ireland															Yes	Yes	Yes	Yes	e	No	e	No	e	No	g	No
DISP_09	WARRENPOINT	IS670	Closed	119.0	118.1	1	Northern Ireland															Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_10	Shell Lagoon, Llanbedr	IS018	Open	119.2	118.6	1	Wales															Yes	Yes	Yes	Yes	e	No	e	No	e	No	g	No
DISP_11	NEW QUAY TRACK	IS015	Open	120.2	119.6	1	Wales															Yes	Yes	Yes	Yes	e	No	e	No	e	No	g	No
DISP_12	POINT LYNAS	IS050	Closed	122.2	121.3	1	Wales															Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_13	Kilkeel	IS650	Open	123.1	122.2	1	Northern Ireland															Yes	Yes	Yes	Yes	e	No	e	No	e	No	g	No
DISP_14	CARLINGFORD	IS660	Closed	127.7	126.8	1	Northern Ireland															Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_15	CONWY BAY	IS055	Closed	131.3	130.4	1	Wales															Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_16	PUFFIN ISLAND	IS060	Closed	134.2	133.4	1	Wales															Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_17	NEWCASTLE (NI)	IS640	Closed	140.8	139.9	1	Northern Ireland															Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_18	ARDGLASS	IS635	Closed	142.6	141.7	1	Northern Ireland															Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_19	DUNDRUM BAY	IS630	Closed	142.6	141.7	1	Northern Ireland															Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_20	CONWY BENEFICIAL USE	IS065	Open	144.2	143.4	1	Wales															Yes	Yes	Yes	Yes	e	No	e	No	e	No	g	No
DISP_21	CONWY BENEFICIAL USE	IS066	Open	144.3	143.4	1	Wales															Yes	Yes	Yes	Yes	e	No	e	No	e	No	g	No
DISP_22	DEGANWY BENEFICIAL USE	IS035	Open	144.7	143.8	1	Wales															Yes	Yes	Yes	Yes	e	No	e	No	e	No	g	No
DISP_23	ARDGLASS B	IS636	Disused	145.0	144.1	1	Northern Ireland															Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_24	CASTLETOWN BAY (I.O.M)	IS440	Closed	146.6	145.7	1	Isle of Man															Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_25	Awel y Mor	IS067	Open	148.5	147.6	1	Wales															Yes	Yes	Yes	Yes	e	No	e	No	e	No	g	No
DISP_26	PORT ST. MARY (I.O.M)	IS430	Closed	150.4	149.4	1	Isle of Man															Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_27	MANX WATERS	IS134	Closed	150.4	149.4	1	Isle of Man															Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_28	MANX WATRS (fish waste)	IS435	Closed	150.4	149.4	1	Isle of Man															Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_29	DOUGLAS (I.O.M)	IS400	Open	164.2	163.2	1	Isle of Man															Yes	Yes	Yes	Yes	e	No	e	No	e	No	g	No
DISP_30	PEEL (I.O.M)	IS420	Open	164.2	163.2	1	Isle of Man															Yes	Yes	Yes	Yes	e	No	e	No	e	No	g	No
DISP_31	LIVERPOOL BAY (SLUDGE) B	IS071	Closed	164.4	163.5	1	England															Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_32	LIVERPOOL BAY (SLUDGE)	IS070	Closed	164.5	163.6	1	England															Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_33	Morgan and Morecambe OWFs	IS156	Open	165.3	164.3	1	England															Yes	Yes	Yes	Yes	e	No	e	No	e	No	g	No
DISP_34	Morgan OWF	IS155	Closed	165.3	164.3	1	England															Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_35	LIVERPOOL BAY (INDUSTRIAL)	IS080	Closed	166.6	165.7	1	England															Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_36	SITE I (NW LIGHT FLOAT)	IS090	Closed	167.4	166.5	1	England															Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_37	Douglas Harbour (I.O.M)	IS445	Open	167.5	166.5	1	Isle of Man															Yes	Yes	Yes	Yes	e	No	e	No	e	No	g	No
DISP_38	ARDMILLON	IS610	Closed	174.2	173.4	1	Northern Ireland															Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_39	LAXEY BAY (I.O.M)	IS450	Closed	174.7	173.7	1	Isle of Man															Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_40	PORTAVOGIE	IS620	Open	175.2	174.3	1	Northern Ireland															Yes	Yes	Yes	Yes	e	No	e	No	e	No	g	No
DISP_41	SITE Y	IS150	Open	178.2	177.2	1	England/Wales															Yes	Yes	Yes	Yes	e	No	e	No	e	No	g	No
DISP_42	BHP PIPELINE ROUTE	IS149	Closed	178.5	177.6	1	England/Wales															Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_43	MOSTYN DEEP	IS101	Closed	180.5	179.7	1	England/Wales															Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_44	MOSTYN DEEP (MAINTENANCE)	IS102	Open	180.5	179.7	1	England															Yes	Yes	Yes	Yes	e	No	e	No	e	No	g	No
DISP_45	Burbo Bank Extension OWF	IS135	Open	180.6	179.8	1	England/Wales															Yes	Yes	Yes	Yes	e	No	e	No	e	No	g	No
DISP_46	Mostyn Breakwater	IS103	Open	182.4	181.6	1	England															Yes	Yes	Yes	Yes	e	No	e	No	e	No	g	No
DISP_47	DEE ESTUARY	IS100	Closed	183.1	182.3	1	England/Wales															Yes	Yes	Yes	No	e	No	e	No	e	No	g	No

DISP_48	ISLE OF MAN SITE C	IS460	Closed	183.1	182.2	1	England/Scotland													Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_49	Walney OWF	IS215	Closed	187.3	186.3	1	England													Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_50	SITE Z	IS140	Open	187.9	187.0	1	England													Yes	Yes	Yes	Yes	e	No	e	No	e	No	g	No
DISP_51	RAMSEY (I.O.M)	IS410	Closed	188.9	187.9	1	Scotland													Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_52	BHP PIPELINE ROUTE	IS148	Closed	189.0	188.1	1	Northern Ireland													Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_53	SITE Z (ORIGINAL AREA)	IS145	Closed	191.6	190.8	1	England													Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_54	BEAUFORTS DYKE, SCOTLAND	IS280	Closed	192.3	191.4	1	Scotland													Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_55	BELFAST DREDGINGS	IS540	Closed	192.5	191.6	1	Northern Ireland													Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_56	Formby & Taylors Point	IS132	Closed	193.1	192.3	1	Northern Ireland													Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_57	GATEWAY GAS STORAGE PROJECT	IS195	Closed	193.4	192.4	1	Northern Ireland													Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_58	BEAUFORTS DYKE	IS260	Closed	194.1	193.2	1	England													Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_59	BHP PIPELINE ROUTE	IS147	Closed	194.8	193.9	1	Northern Ireland													Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_60	BANGOR	IS580	Closed	194.8	193.9	1	England													Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_61	FOLLY ROAD	IS530	Closed	196.1	195.2	1	England													Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_62	COPELAND ISLAND	IS600	Closed	196.3	195.4	1	Northern Ireland													Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_63	CARRICKFERGUS	IS520	Closed	199.3	198.4	1	Northern Ireland													Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_64	BELFAST DREDGINGS B	IS595	Closed	200.2	199.4	1	Northern Ireland													Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_65	BURROW HEAD B	IS300	Closed	200.4	199.4	1	England													Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_66	EDEN	IS510	Closed	201.1	200.2	1	Northern Ireland													Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_67	PRESTON	IS160	Closed	202.7	201.8	1	Northern Ireland													Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_68	BELFAST SLUDGE	IS590	Closed	203.2	202.3	1	Northern Ireland													Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_69	BLACK HEAD	IS500	Closed	205.7	204.8	1	England													Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_70	BELFAST DREDGINGS C	IS591	Open	206.0	205.2	1	Northern Ireland													Yes	Yes	Yes	Yes	e	No	e	No	e	No	g	No
DISP_71	DRUMMORE	IS285	Closed	208.6	207.6	1	Scotland													Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_72	DRUMMORE A	IS286	Closed	208.7	207.7	1	Scotland													Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_73	DRUMMORE C	IS288	Closed	208.8	207.9	1	Scotland													Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_74	DRUMMORE B	IS287	Closed	208.9	207.9	1	Scotland													Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_75	BARROW D	IS205	Open	211.7	210.7	1	England													Yes	Yes	Yes	Yes	e	No	e	No	e	No	g	No
DISP_76	BARROW B	IS210	Closed	212.3	211.3	1	England													Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_77	BARROW A	IS180	Disused	216.0	215.1	1	England													Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_78	LARNE	MA600	Closed	216.7	215.8	1	Northern Ireland													Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_79	BURROW HEAD A	IS310	Closed	217.4	216.4	1	Scotland													Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_80	LARNE B	MA601	Closed	218.3	217.4	1	Northern Ireland													Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_81	LARNE A	MA605	Disused	218.3	217.4	1	Northern Ireland													Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_82	MORECAMBE BAY: LUNE DEEP	IS170	Open	219.5	218.6	1	England													Yes	Yes	Yes	Yes	e	No	e	No	e	No	g	No
DISP_83	PORTPATRICK	IS290	Closed	220.2	219.3	1	Scotland													Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_84	FLEETWOOD CHANNEL	IS171	Closed	223.2	222.2	1	England													Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_85	STRANRAER	MA015	Closed	223.2	222.4	1	Scotland													Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_86	RIVER WYRE ESTUARY	IS175	Closed	223.3	222.3	1	England													Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_87	NORTH CHANNEL, SCOTLAND	MA010	Disused	223.4	222.6	1	Scotland													Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_88	MORECAMBE BAY B	IS200	Open	224.0	223.0	1	England													Yes	Yes	Yes	Yes	e	No	e	No	e	No	g	No
DISP_89	CARNLOUGH B	MA585	Closed	230.4	229.5	1	Northern Ireland													Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_90	CARNLOUGH A	MA581	Closed	230.7	229.8	1	Northern Ireland													Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_91	CARNLOUGH	MA580	Closed	230.9	230.0	1	Northern Ireland													Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_92	LUNE RIVER	IS190	Closed	234.1	233.2	1	England													Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_93	LUNE RIVER B	IS192	Open	234.4	233.4	1	Scotland/England													Yes	Yes	Yes	Yes	e	No	e	No	e	No	g	No
DISP_94	WHITEHAVEN	IS230	Closed	234.8	233.8	1	England													Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_95	SALTOM BAY	IS220	Closed	235.3	234.3	1	England													Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_96	HARRINGTON HARBOUR	IS231	Closed	243.4	242.4	1	England													Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_97	Kirkcudbright	MA012	Open	245.9	244.9	1	Scotland													Yes	Yes	Yes	Yes	e	No	e	No	e	No	g	No
DISP_98	WORKINGTON ANCHORAGE	IS241	Open	246.0	245.0	1	England													Yes	Yes	Yes	Yes	e	No	e	No	e	No	g	No
DISP_99	SOLWAY FIRTH	IS240	Open	246.5	245.5	1	England													Yes	Yes	Yes	Yes	e	No	e	No	e	No	g	No
DISP_100	MARYPORT HARBOUR DISPERSIVE SITE B	IS244	Closed	254.8	253.8	1	England													Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_101	MARYPORT HARBOUR DISPERSIVE	IS245	Closed	255.0	254.0	1	England													Yes	Yes	Yes	No	e	No	e	No	e	No	g	No
DISP_102	SILLOTH B	IS251	Open	270.7	269.7	1	England													Yes	Yes	Yes	Yes	e	No	e	No	e	No	g	No
DISP_103	SILLOTH	IS250	Closed	273.1	272.1	1	England													Yes	Yes	Yes	No	e	No	e	No	e	No	g	No

Offshore Cumulative Effects Assessment Matrix - Dumping at Sea - Celtic Sea Region

Other Development Details									Phases of Other Developments in relation to the construction phase of the Proposed Development (denoted in red)												Stage 1				Stage 2							
ID	Permit Number	Permit Holder	Method	Status	Distance to the Proposed Development Array Area (km)	Distance to the Proposed Development Cable Corridor and Working Area (km)	Tier	Region	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	ICES Celtic Sea 7a	ICES Celtic Sea	Within ZoI for at least one topic?	Progress to Stage 2?	Overlap in temporal scope?	Benthic Subtidal and Intertidal Ecology		Fish, Shellfish and Sea Turtle Ecology		Marine Mammals		Offshore Ornithology	
																												Potential LSE Criteria	Progress to Stage 3/4?	Potential LSE Criteria	Progress to Stage 3/4?	Potential LSE Criteria	Progress to Stage 3/4?	Potential LSE Criteria	Progress to Stage 3/4?
DAS_01	S0027-01	Arklow Energy Limited	Plough Dredging	Operational	0	0.8	1	Ireland															Yes	Yes	Yes	Yes	No	d	No	d	No	g	No	g	No
DAS_02	FS0075583	Wicklow County Council	Bed-level dredging and mechanical dredging	Operational	9.7	8.9	1	Ireland															Yes	Yes	Yes	Yes	No	e	No	c	Yes	g	No	g	No
DAS_03	S0024-02	Dublin Port Company	Release of the material through the hull of the vessel while the vessel is in motion	Operational	45.1	44.2	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	c	Yes	g	No	g	No
DAS_04	S0004-03	Dublin Port Company	Release of the material through the hull of the vessel while the vessel is in motion	Operational	45.2	44.3	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	c	Yes	g	No	g	No
DAS_05	S0010-01	Howth Yacht Club	Dredged material from capital dredging	Inactive	45.14	44.22	1	Ireland															Yes	Yes	Yes	Yes	No	e	No	d	No	g	No	g	No
DAS_06	S0016-01	Iarnrod Eireann (Rosslare Euro	Dredged material from maintenance dredging	Inactive	46.9	46.4	3	Ireland															Yes	Yes	Yes	Yes	No	e	No	d	No	g	No	g	No
DAS_07	S0031-01	Malahide Marina Village Limite	Water Injection Dredging	Operational	61.3	60.4	1	Ireland															Yes	Yes	Yes	Yes	No	e	No	d	No	g	No	g	No
DAS_08	S0030-01	Wexford County Council	Release of dredge material through the hull of the vessel while the vessel is in motion.	Operational	75.9	75.3	1	Ireland															Yes	Yes	Yes	Yes	Yes	e	No	c	Yes	g	No	g	No
DAS_09	S0012-03	Port of Waterford Company	Plough dredging	Inactive	90.4	89.8	3	Ireland															No	Yes	Yes	Yes	No	e	No	d	No	g	No	g	No
DAS_10	S0012-03	Port of Waterford Company	Plough dredging	Inactive	90.4	89.8	3	Ireland															No	Yes	Yes	Yes	No	e	No	d	No	g	No	g	No
DAS_11	S0012-03	Port of Waterford Company	Plough dredging	Inactive	90.4	89.8	3	Ireland															No	Yes	Yes	Yes	No	e	No	d	No	g	No	g	No
DAS_12	S0012-03	Port of Waterford Company	Plough dredging	Inactive	90.4	89.8	3	Ireland															No	Yes	Yes	Yes	No	e	No	d	No	g	No	g	No
DAS_13	S0012-03	Port of Waterford Company	Plough dredging	Inactive	90.4	89.8	3	Ireland															No	Yes	Yes	Yes	No	e	No	d	No	g	No	g	No
DAS_14	S0012-03	Port of Waterford Company	Plough dredging	Inactive	90.4	89.8	3	Ireland															No	Yes	Yes	Yes	No	e	No	d	No	g	No	g	No
DAS_15	S0012-03	Port of Waterford Company	Plough dredging	Inactive	90.4	89.8	3	Ireland															No	Yes	Yes	Yes	No	e	No	d	No	g	No	g	No
DAS_16	S0012-03	Port of Waterford Company	Plough dredging	Inactive	90.4	89.8	3	Ireland															No	Yes	Yes	Yes	No	e	No	d	No	g	No	g	No
DAS_17	S0012-03	Port of Waterford Company	Plough dredging	Inactive	90.4	89.8	3	Ireland															No	Yes	Yes	Yes	No	e	No	d	No	g	No	g	No
DAS_18	S0012-03	Port of Waterford Company	Plough dredging	Inactive	90.4	89.8	3	Ireland															No	Yes	Yes	Yes	No	e	No	d	No	g	No	g	No
DAS_19	S0012-03	Port of Waterford Company	Plough dredging	Inactive	90.4	89.8	3	Ireland															No	Yes	Yes	Yes	No	e	No	d	No	g	No	g	No
DAS_20	S0012-03	Port of Waterford Company	Plough dredging	Inactive	90.4	89.8	3	Ireland															No	Yes	Yes	Yes	No	e	No	d	No	g	No	g	No
DAS_21	S0012-03	Port of Waterford Company	Plough dredging	Inactive	90.4	89.8	3	Ireland															No	Yes	Yes	Yes	No	e	No	d	No	g	No	g	No
DAS_22	S0012-03	Port of Waterford Company	Plough dredging	Inactive	90.4	89.8	3	Ireland															No	Yes	Yes	Yes	No	e	No	d	No	g	No	g	No
DAS_23	S0012-03	Port of Waterford Company	Plough dredging	Inactive	90.4	89.8	3	Ireland															No	Yes	Yes	Yes	No	e	No	d	No	g	No	g	No
DAS_24	S0012-03	Port of Waterford Company	Plough dredging	Inactive	90.4	89.8	3	Ireland															No	Yes	Yes	Yes	No	e	No	d	No	g	No	g	No
DAS_25	S0012-03	Port of Waterford Company	Release of dredge material through the hull of the vessel while the vessel is in motion at low speed	Inactive. Extension applied for.	90.4	89.8	3	Ireland															No	Yes	Yes	Yes	No	e	No	d	No	g	No	g	No
DAS_26	S0015-02	Drogheda Port Company	Dumping site A1 Release of the material through the hull of the vessel while the vessel is in motion (2,816,000 tonnes)	Operational	95.5	94.6	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	d	No	g	No	g	No
DAS_27	S0015-03	Drogheda Port Company	Dumping site A2 Release of the material through the hull of the vessel while the vessel is in motion (2,816,000 tonnes)	Operational	95.5	94.6	1	Ireland															No	Yes	Yes	Yes	Yes	e	No	d	No	g	No	g	No
DAS_28	S0009-03	Shannon Foynes Port Company	Plough Dredging	Operational	178.9	171.6	1	Ireland															No	Yes	Yes	Yes	No	e	No	d	No	g	No	g	No
DAS_29	S0009-03	Shannon Foynes Port Company	Plough dredging	Operational	178.9	171.6	1	Ireland															No	Yes	Yes	Yes	No	e	No	d	No	g	No	g	No
DAS_30	S0009-03	Shannon Foynes Port Company	Release of dredge material through the hull of the vessel while the vessel is in motion	Operational	178.9	171.6	1	Ireland															No	Yes	Yes	Yes	No	e	No	d	No	g	No	g	No
DAS_31	S0009-03	Shannon Foynes Port Company	Release of dredge material through the hull of the vessel while the vessel is in motion	Operational	178.9	171.6	1	Ireland															No	Yes	Yes	Yes	No	e	No	d	No	g	No	g	No
DAS_32	S0009-03	Shannon Foynes Port Company	Plough dredging	Operational	178.9	171.6	1	Ireland															No	Yes	Yes	Yes	No	e	No	d	No	g	No	g	No
DAS_33	S0009-03	Shannon Foynes Port Company	Release of dredge material through the hull of the vessel while the vessel is in motion	Operational	178.9	171.6	1	Ireland															No	Yes	Yes	Yes	No	e	No	d	No	g	No	g	No
DAS_34	S0026-01	Aughanish Alumina Limited	Plough dredging - silt and fine sand	Inactive	207.2	200	3	Ireland															No	Yes	Yes	Yes	No	e	No	d	No	g	No	g	No
DAS_35	S0026-01	Aughanish Alumina Limited	Plough dredging - silt and fine sand	Inactive	207.2	200	3	Ireland															No	Yes	Yes	Yes	No	e	No	d	No	g	No	g	No
DAS_36	S0026-01	Aughanish Alumina Limited	Plough dredging - silt and fine sand	Inactive	207.2	200	3	Ireland															No	Yes	Yes	Yes	No	e	No	d	No	g	No	g	No
DAS_37	S0023-01	Sligo County Council	Water Injection Dredging	Planning	227.5	225.6	3	Ireland															No	Yes	Yes	Yes	No	e	No	d	No	g	No	g	No
DAS_38	S0023-01	Sligo County Council	Release of dredge material through hull of vessel	Planning	227.5	225.6	3	Ireland															No	Yes	Yes	Yes	No	e	No	d	No	g	No	g	No
DAS_39	S0020-02	L&M Keating Maritime Limited	Plough Dredging	Planning	237.4	230	3	Ireland															No	Yes	Yes	Yes	No	e	No	d	No	g	No	g	No
DAS_40	S0011-03	Donegal County Council	Plough Dredging	Planning	265.2	264.3	3	Ireland															No	Yes	Yes	Yes	No	e	No	d	No	g	No	g	No
DAS_41	S0007-03	Kerry County Council	Plough dredging	Planning	267.6	262.2	3	Ireland															No	Yes	Yes	Yes	Yes	e	No	d	No	g	No	g	No
DAS_42	S0007-03	Kerry County Council	Release of dredge material through the hull of the vessel while the vessel is in motion	Planning	267.6	262.2	3	Ireland															No	Yes	Yes	Yes	Yes	e	No	d	No	g	No	g	No
DAS_43	S0007-03	Kerry County Council	Release of dredge material through the hull of the vessel while the vessel is in motion	Planning	267.6	262.2	3	Ireland															No	Yes	Yes	Yes	Yes	e	No	d	No	g	No	g	No
DAS_44	S0007-03	Kerry County Council	Plough dredging	Planning	267.6	262.2	3	Ireland															No	Yes	Yes	Yes	Yes	e	No	d	No	g	No	g	No
DAS_45	S0007-03	Kerry County Council	Plough dredging	Planning	267.6	262.2	3	Ireland															No	Yes	Yes	Yes	Yes	e	No	d	No	g	No	g	No
DAS_46	S0007-03	Kerry County Council	Plough dredging	Planning	267.6	262.2	3	Ireland															No	Yes	Yes	Yes	Yes	e	No	d	No	g	No	g	No

Offshore Cumulative Effects Assessment Matrix - Surveys - Celtic Sea Subsection 7a

Other Development Details									Phases of Other Developments in relation to the construction phase of the Proposed Development (denoted in red)														Stage 1			Stage 2							
ID	Project	Developer / Applicant	Licence	Status	Distance to the Proposed Development Array Area (km)	Distance to the Proposed Development Cable Corridor and Working Area (km)	Tier	Region	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	ICES Celtic Sea 7a	Within ZoI for at least one topic?	Progress to Stage 2?	Overlap in temporal scope?	Benthic Subtidal and Intertidal Ecology		Fish, Shellfish and Sea Turtle Ecology		Marine Mammals		Offshore Ornithology	
																											Potential LSE Criteria	Progress to Stage 3/4?	Potential LSE Criteria	Progress to Stage 3/4?	Potential LSE Criteria	Progress to Stage 3/4?	Potential LSE Criteria	Progress to Stage 3/4?
SUR_01	Sure Partners Arklow Bank Wind Park Phase 2 Site Investigations	Sure Partners Limited	FS007339	Approved	0.03	0.00	1	Ireland															Yes	Yes	Yes	Yes	g	No	g	No	g	No	g	No
SUR_02	Sure Partners Site Investigations at Arklow Bank	Sure Partners/SSE	FS007049	Ended	0.15	0.00	1	Ireland															Yes	Yes	Yes	No	g	No	g	No	g	No	g	No
SUR_03	Arklow Bank Wind Park off coast of County Wicklow	Sure Partners Limited	FS007555	Approved	0.54	0.04	1	Ireland															Yes	Yes	Yes	Yes	g	No	g	No	g	No	g	No
SUR_04	Deployment of passive acoustic monitoring devices to describe seasonal and diurnal occurrence of whales, dolphins and porpoises (cetaceans) in the Irish Sea and the Celtic Sea as part of the CETUS research project.	University College Cork	LIC230006	Approved	2.20	1.70	1	Ireland															Yes	Yes	Yes	No	g	No	g	No	e	No	g	No
SUR_05	Hibernian Wind Power - Kilmichael Point	Hibernian Wind Power	FS006788	Approved	5.71	0.00	1	Ireland															Yes	Yes	Yes	No	g	No	g	No	d	No	g	No
SUR_54	Wicklow Sea Wind Ltd - Cable Route Site Investigations. Site investigations for an export cable corridor from a Celtic Sea OWF to the Wicklow coast	Wicklow Sea Wind Ltd (Inis Offshore Wind)	FS007588	Consultation	5.85	4.98	3	Ireland															Yes	Yes	Yes	Yes	g	No	g	No	d	No	g	No
SUR_06	Wicklow Sea Wind Ltd., Site Investigations for the proposed Wicklow Project offshore wind farm, off County Wicklow	Wicklow Sea Wind Limited	FS007163	Consultation	7.83	6.97	2	Ireland															Yes	Yes	Yes	No	g	No	g	No	d	No	g	No
SUR_07	Irish Water - Arklow	Irish Water	FS006614	Application submitted	10.82	3.39	2	Ireland															Yes	Yes	Yes	No	g	No	g	No	d	No	g	No
SUR_08	A Geotechnical Investigation (GI) and Geophysical site investigation surveys to inform design options for the proposed East Coast Rail Infrastructure Protection Projects (ECRIPP). The purpose of ECRIPP is to implement protection measures to at risk sections of the Dublin to Wexford railway line from the effects of climate change and coastal erosion.	Iarnród Éireann	LIC230028	Application submitted	11.11	10.32	3	Ireland															Yes	Yes	Yes	No	g	No	g	No	d	No	g	No
SUR_09	Site investigation	RWE Renewables Ireland	FS007188	Approved	11.80	10.90	1	Ireland															Yes	Yes	Yes	Yes	g	No	g	No	d	No	g	No
SUR_10	Energia Site Investigation off Wexford Coast	Energia Offshore Wind Ltd.	FS007048	Approved	11.94	11.44	1	Ireland															Yes	Yes	Yes	No	g	No	g	No	d	No	g	No
	Banba Wind Ltd., Site Investigations for proposed Offshore Wind Farm, off Counties Wicklow and Dublin	Banba Wind Limited	FS007283	Withdrawn	13.91	13.41	n/a	Ireland															Yes	Yes	Yes	No	g	No	g	No	e	No	g	No
SUR_11	Sunrise Wind Ltd., Site Investigations for the proposed Sunrise Offshore Wind Farm, off Counties Dublin and Wicklow	Sunrise Wind Limited	FS007151	Withdrawn	17.7	16.8	n/a	Ireland															Yes	Yes	Yes	No	g	No	g	No	e	No	g	No
SUR_12	Latitude 52 Offshore Wind Farm - Site Investigation	DP Energy Ireland / Latitude 52 Offshore Wind Farm Ltd	FS007232	Consultation	17.75	17.07	3	Ireland															Yes	Yes	Yes	No	g	No	g	No	e	No	g	No
SUR_13	Site investigation surveys to inform potential offshore wind farm development	RWE	FS0007029	Approved	25.8	30.5	1	Ireland															Yes	Yes	Yes	No	g	No	g	No	d	No	g	No
SUR_14	Providence Resources P.L.C.	Providence Resources P.L.C.	FS006192	Approved	34.9	34.0	1	Ireland															Yes	Yes	Yes	No	g	No	g	No	d	No	g	No
SUR_15	Réalt na Mara Offshore Wind Farm - Site Investigations. Site investigations for OWF turbines, export cable and grid infrastructure off Wicklow & Dublin	Réalt na Mara Offshore Wind Farm Ltd	FS007330	Consultation	35.19	34.30	3	Ireland															Yes	Yes	Yes	Yes	g	No	g	No	e	No	g	No
	Environmental survey and ground investigation works in order to inform the design of proposed Point Bridge and Tom Clarke Widening Project.	Dublin City Council	LIC230007	Application submitted	51.4	50.5	3	Ireland															Yes	Yes	Yes	No	g	No	g	No	d	No	g	No
SUR_16	Dublin Port Company Site Investigations	Dublin Port Company	FS006497	Approved	51.5	50.6	1	Ireland															Yes	Yes	Yes	No	g	No	g	No	d	No	g	No
SUR_17	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.	Microsoft Ireland Operations Ltd	LIC230016	Application submitted	51.8	51.0	3	Ireland															Yes	Yes	Yes	No	g	No	g	No	d	No	g	No
SUR_18	Bord Gais Networks - Dublin	Bord Gais Network	FS006104	Approved	53.0	52.0	1	Ireland															Yes	Yes	Yes	Yes	g	No	g	No	e	No	g	No
SUR_19	Greater Dublin Drainage Project	Irish Water	FS006292	Ended	56.8	55.9	1	Ireland															Yes	Yes	Yes	No	g	No	g	No	d	No	g	No
SUR_20	UCD Soil and Vegetation Sampling - Baldoyle	University College Dublin	FS007192	Consultation	57.3	56.4	3	Ireland															Yes	Yes	Yes	No	g	No	g	No	d	No	g	No
	GEO Networks Ltd	Geo Networks Ltd	FS006262	Approved	58.6	57.7	1	Ireland															Yes	Yes	Yes	No	g	No	g	No	d	No	g	No
SUR_21	Rockabill Cable Systems Ltd	Rockabill Cable Systems Ltd	FS006842	Approved	65.1	64.2	1	Ireland															Yes	Yes	Yes	Yes	g	No	g	No	e	No	g	No
SUR_22	Codling Wind Park 11 Ltd	Codling Wind Park Ltd	FS006460	Application submitted	67.1	66.1	3	Ireland															Yes	Yes	Yes	No	g	No	g	No	d	No	g	No
SUR_23	Codling Wind Park Ltd	Codling Wind Park Ltd	FS006241	Consultation	67.1	66.1	3	Ireland															Yes	Yes	Yes	No	g	No	g	No	d	No	g	No
SUR_24	Codling Wind Park Ltd.	Codling Wind Park Ltd	FS007045	Approved	67.1	66.1	1	Ireland															Yes	Yes	Yes	No	g	No	g	No	d	No	g	No
SUR_25	Codling Wind Park Ltd. Site Investigations for proposed Offshore Wind Farm, off Counties Wicklow and Dublin	Codling Wind Park Limited	FS007546	Approved	67.1	66.1	1	Ireland															Yes	Yes	Yes	Yes	g	No	g	No	e	No	g	No
	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.	Microsoft Ireland Operations Ltd	LIC230018	Application submitted	69.1	68.1	3	Ireland															Yes	Yes	Yes	No	g	No	g	No	g	No	g	No
SUR_26	America Europe Connect Ltd	America Europe Connect Ltd	FS006746	Approved	71.8	70.9	1	Ireland															Yes	Yes	Yes	No	g	No	g	No	d	No	g	No
SUR_27	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.	North Irish Sea Array Windfarm Limited	LIC230001	Consultation	78.5	77.6	3	Ireland															Yes	Yes	Yes	Yes	g	No	g	No	g	No	g	No
SUR_28	Greenwire Ltd - Skerries	Greenwire Ltd - Skerries	FS005722	Application submitted	78.7	77.8	1	Ireland															Yes	Yes	Yes	No	g	No	g	No	d	No	g	No
SUR_29	MaresConnect Electricity Interconnector Site Investigation	Maresconnect Ltd	FS007635	Approved	81.8	80.9	1	Ireland															Yes	Yes	Yes	Yes	g	No	g	No	e	No	g	No
SUR_30	America Europe Connect Ltd	America Europe Connect Ltd	FS006631	Approved	82.9	82.0	1	Ireland															Yes	Yes	Yes	No	g	No	g	No	d	No	g	No
	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	Port of Waterford	LIC230013	Application submitted	83.6	83.1	3	Ireland															Yes	Yes	Yes	No	g	No	g	No	g	No	g	No

SUR_31	PiPiper Infrastructure Ltd	PiPiper Infrastructure Ltd	FS006762	Consultation	85.1	84.2	3	Ireland															Yes	Yes	Yes	No	g	No	g	No	d	No	g	No
SUR_32	Statkraft North Irish Sea Array (NISA) Site Investigations for Export Cable Route	North Irish Sea Array (NISA) Windfarm Limited	FS007358	Approved	86.6	85.7	1	Ireland															Yes	Yes	Yes	No	g	No	g	No	d	No	g	No
SUR_33	Lir Offshore Array Ltd., Site Investigations for the proposed Lir Offshore Array, off Counties Louth, Meath and Dublin	Lir Offshore Array Limited	FS007392	Application submitted	87.2	86.3	3	Ireland															Yes	Yes	Yes	No	g	No	g	No	d	No	g	No
SUR_34	East Celtic Offshore Wind Park - RWE Renewables. SI for East Celtic Offshore Wind Park off Wexford & Waterford (geophysical, geotechnical, environmental & metocean).***	RWE Renewables Ireland East Celtic Ltd	FS007318	Application submitted	87.26	86.68	3	Ireland															Yes	Yes	Yes	Yes	g	No	g	No	e	No	g	No
SUR_35	Cooley Point	Hibernian Wind Power	FS006852	Approved	91.8	90.9	1	Ireland															Yes	Yes	Yes	No	g	No	g	No	d	No	g	No
	North Irish Sea Array (NISA) Site Investigations	Statkraft	FS007031	Approved	95.7	94.8	1	Ireland															Yes	Yes	Yes	No	g	No	g	No	e	No	g	No
SUR_36	Braymore Point	SSE Renewables	FS006973	Approved	104.5	103.5	1	Ireland															Yes	Yes	Yes	No	g	No	g	No	d	No	g	No
SUR_37	Clogher Head	Hibernian Wind Power	FS006787	Approved	108.3	107.4	1	Ireland															Yes	Yes	Yes	No	g	No	g	No	d	No	g	No
SUR_38	Oriel Windfarm Ltd	Oriel Windfarm Ltd	FS006459	Application submitted	108.4	107.5	3	Ireland															Yes	Yes	Yes	Yes	g	No	g	No	e	No	g	No
SUR_39	Oriel Windfarm Limited, Site Investigations for the proposed offshore Oriel Wind Farm	Oriel Windfarm Ltd	FS007383	Approved	111.7	110.8	1	Ireland															Yes	Yes	Yes	No	g	No	g	No	e	No	g	No
SUR_40	Foreshore Licence application for geophysical, geotechnical, ecological and metocean site investigation works. Dundalk	Oriel Windfarm Ltd	FS006840	Approved	115.1	114.2	1	Ireland															Yes	Yes	Yes	No	g	No	g	No	d	No	g	No
	North Celtic Sea Offshore Wind - Energia Renewables. Foreshore licence granted Sept 2021 - seabed surveys completed in 2022. Geophysical & geotechnical surveys for the North Celtic Sea OWF off Waterford.	Energia Renewables ROI Ltd	FS006982	Approved	118.27	117.68	3	Ireland															Yes	Yes	Yes	No	g	No	g	No	e	No	g	No
SUR_41	Inis Ealga Marine Energy Park - Site Investigation. Full SI suite (geophysical, geotechnical, environmental, metocean) for floating OWF off south-west Ireland.	DP Energy Ireland / Inis Ealga Marine Energy Park Ltd	FS006859	Approved	130.83	130.25	1	Ireland															No	Yes	Yes	No	g	No	g	No	e	No	g	No
SUR_42	TwinHub Floating Offshore Wind Project - Site Investigations. Offshore site investigation works for floating OWF demonstrator.	TwinHub Ltd	Unknown	Approved	151.48	150.79	1	England															No	Yes	Yes	No	g	No	g	No	e	No	g	No
SUR_43	Crown Estate / NRW Band 2 Geophysical Survey - Celtic Sea FLOW areas.	Crown Estate / Natural Resources Wales	Unknown	Approved	176.81	176.19	2	England/Wales															No	Yes	Yes	No	g	No	g	No	e	No	g	No
SUR_44	White Cross Floating Offshore Wind - Site investigations	White Cross Offshore Wind Ltd	Unknown	Application submitted	180.80	180.14	1	England															No	Yes	Yes	No	g	No	g	No	e	No	g	No
SUR_45	Emerald Floating Wind - Celtic Sea off Cork. Phased geophysical & geotechnical surveys for Emerald Floating Wind in the Celtic Sea.	Simply Blue Energy / Emerald Offshore Wind Ltd	FS007139	Application submitted	183.5	182.92	3	Ireland															No	Yes	Yes	No	g	No	g	No	e	No	g	No
SUR_46	Site investigation in the maritime area including reclaimed dockland and surrounding nearshore to aid the design of increased port facilities in support of the ORE industry.	Doyle Shipping Group	LIC230019	Application submitted	183.7	183.2	3	Ireland															Yes	Yes	Yes	No	g	No	g	No	d	No	g	No
SUR_47	Maintenance dredging at four sites around the Aughinish Alumina Ltd (AAL) jetty, Shannon Estuary, Co. Limerick, and dumping of dredge material at a dump site off Foynes Island	Aughinish Alumina Ltd	LIC230004	Application submitted	207.6	200.3	3	Ireland															Yes	Yes	Yes	Yes	g	No	g	No	d	No	g	No
SUR_48	Site investigation to support the preliminary and detailed engineering design of the deep water terminal development on Foynes island.	Shannon Foynes	LIC230014	Application submitted	209.8	202.7	3	Ireland															Yes	Yes	Yes	No	g	No	g	No	d	No	g	No
SUR_49	ESB intends to undertake a survey campaign at the 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.	Electricity Supply Board	LIC230008	Application submitted	229.5	222.4	3	Ireland															Yes	Yes	Yes	No	g	No	g	No	d	No	g	No
SUR_50	Atlantic Offshore Renewable Energy 2 - Site Investigations (Galway Bay)	Atlantic Offshore Renewable Energy 2 Ltd	FS007495	Withdrawn	257.84	248.06	n/a	Ireland															No	Yes	Yes	No	g	No	g	No	e	No	g	No
SUR_51	Clarus Offshore Wind Farm - Cable Investigation Area SI. Site investigations for export cable corridors associated with Clarus OWF (off Kerry/Clare).***	Clarus Offshore Wind Farm Ltd	FS006886	Consultation	268.07	260.16	3	Ireland															No	Yes	Yes	Yes	g	No	g	No	e	No	g	No
SUR_52	Proposed installation and operation of the 2Africa Submarine Cable System within the Irish Exclusive Economic Zone (EEZ). The planned cable will extend from Widemouth Bay in Cornwall to a number of countries in Europe, Africa, and the Middle East.	Apollo Submarine Cable System Limited	LIC230033	Application submitted	279.3	278.7	3	Ireland															Yes	Yes	Yes	Yes	g	No	g	No	d	No	g	No
SUR_53	Malin Array Offshore Wind Farm - Site Investigations	Malin Array Offshore Wind Farm Ltd	FS007395	Application submitted	282.88	281.96	3	Ireland															No	Yes	Yes	No	g	No	g	No	e	No	g	No

Offshore Cumulative Effects Assessment Matrix - Future Leasing Round or Plan

Other Development Details											
ID	Planning Authority	Leasing Round / Plan	Details	Distance to the Proposed Development Array Area (km)	Distance to the Proposed Development Cable Corridor and Working Area (km)	Tier	Region	Benthic Subtidal and Intertidal Ecology	Fish, Shellfish and Sea Turtle Ecology	Marine Mammals	Offshore Ornithology
FLR_01	Planning Inspectorate	Celtic Sea (UK Round 5)	New Crown Estate leasing opportunity for floating wind in the Celtic Sea. Up to 4.5 GW across 3 Project Development Areas. Agreements for Lease expected 2025.	139.7	139.7	3	Wales / England	e	e	g	g
FLR_02	Danu	South Coast DMAP	No details yet on construction sequencing, ORESS pathway, or connection agreements. Steps (MAC, ORESS, consent) not initiated.	84.3	83.8	3	Ireland	e	e	g	g
FLR_03	Manannán	South Coast DMAP	No details yet on construction sequencing, ORESS pathway, or connection agreements. Steps (MAC, ORESS, consent) not initiated.	97.4	96.8	3	Ireland	e	e	g	g
FLR_04	Lí Ban	South Coast DMAP	No details yet on construction sequencing, ORESS pathway, or connection agreements. Steps (MAC, ORESS, consent) not initiated.	105.3	104.7	3	Ireland	e	e	g	g
FLR_05	Department of Climate, Energy and the Environment	National DMAP	The National Designated Maritime Area Plan (DMAP) for Offshore Renewable Energy (ORE) will provide a spatial planning policy framework for ORE, including spatial designations. The National ORE DMAP will aim to designate sufficient maritime area to deliver a target of 20GW of offshore renewable energy by 2040 taking account of the Phase one projects and sites already designated by the South Coast DMAP (SC-DMAP). SEA yet to be commenced, consulted on and DMAP enacted	N/A	N/A	3	Ireland	g	e	g	g
FLR_06	Department of Climate, Energy and the Environment	OREDP 2	Ireland's Offshore Renewable Energy Development Plan II identifies the EEZ areas most suitable for future offshore renewable energy. Covers 370 km offshore. Forms strategic foundation for DMAPs and long-term leasing through 2040+.	N/A	N/A	3	Ireland	g	e	g	g
FLR_07	DAERA	Northern Ireland Draft Marine Plan	Draft Marine Plan to guide use, protection, and regulation of NI's marine area. Includes inshore and offshore guidance. Still not adopted as of 2025.	N/A	N/A	3	Northern Ireland	g	e	g	g
FLR_08	The Crown Estate	Crown Estate Future Leasing Pipeline (2024–2027)	Strategic programme outlining additional UK offshore wind leasing opportunities, including Celtic Sea extensions, floating wind, innovation leases, and grid-aligned leasing. Key component of future project pipeline.	N/A	N/A	3	Wales / England	g	e	g	g
FLR_09	The Crown Estate	Floating Wind Innovation Leasing (Crown Estate)	Small-scale leasing areas for demonstration and pre-commercial floating wind technologies. Relevant for future cumulative impact as test zones may expand.	N/A	N/A	3	United Kingdom	g	e	g	g